



**Billing Code 4910-13**

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 25**

**[Docket No. FAA-2020-0223; Special Conditions No. 25-768-SC]**

**Special Conditions: GDC Technics, Boeing Model 777-300ER Series Airplane; Lower Lobe Crew Rest Compartment**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions; request for comments.

**SUMMARY:** These special conditions are issued for the Boeing Model 777-300ER series airplane. This airplane, as modified by GDC Technics, 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 a lower lobe crew rest (LLCR) compartment located under the passenger cabin floor of the Boeing Model 777-300ER series airplane. 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:** This action is effective on GDC Technics on [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Send comments on or before [INSERT DATE 45 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** Send comments identified by Docket No. FAA-2020-0223 using any of the following methods:

- *Federal eRegulations Portal:* Go to <http://www.regulations.gov/> and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE., Room W12-140, West Building Ground Floor, Washington, DC, 20590-0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* Fax comments to Docket Operations at 202-493-2251.

*Privacy:* The FAA will post all comments it receives, without change, to <http://www.regulations.gov/>, including any personal information the commenter provides. Using the search function of the docket Web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the *Federal Register* published on April 11, 2000 (65 FR 19477-19478).

*Docket:* Background documents or comments received may be read at <http://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

**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; e-mail Shannon.Lennon@faa.gov.

**SUPPLEMENTARY INFORMATION:** The substance of these special conditions previously has been published in the *Federal Register* for public comment. These special conditions have been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. Therefore, the FAA has determined that prior public notice and comment are unnecessary, and finds that, for the same reason, good cause exists for adopting these special conditions upon publication in the *Federal Register*.

#### **Comments Invited**

The FAA invites interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

The FAA will consider all comments received by the closing date for comments. The FAA may change these special conditions based on the comments received.

#### **Background**

On April 25, 2016, GDC Technics applied for a supplemental type certificate for a LLCR compartment in the Boeing Model 777-300ER series airplane. The Boeing Model 777-300ER series airplane is a twin-engine, transport category airplane, with capacity for 550 passengers, and a maximum takeoff weight of 775,000 pounds.

The LLCR is located under the passenger cabin floor in the aft cargo compartment of Boeing Model 777-300ER series airplanes. Occupancy for the LLCR compartment is limited to a maximum of six (6) occupants. The LLCR will only be occupied in flight, i.e., not during taxi, takeoff, or landing. Six berths are able to withstand the maximum flight loads when the LLCR compartment is at maximum capacity. New components for smoke detection system, oxygen system, emergency lighting system and manual firefighting system (fire extinguisher) will be installed and integrated into existing systems.

Main access to the LLCR compartment is gained via fixed stairs through a hatch in the floor of the main deck. The hatch is hidden from cabin passengers by a full size cabinet. Secondary emergency egress is provided via an additional hatch located forward of the main entrance.

### **Type Certification Basis**

Under the provisions of title 14, Code of Federal Regulations (14 CFR) 21.101, GDC Technics must show that the Boeing Model 777-300ER series 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 777-300ER series 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 applicant apply for a supplemental type certificate to modify any other model included on the

same type certificate 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 777-300ER series 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 777-300ER series airplane will incorporate the following novel or unusual design features:

A LLCR compartment located under the passenger cabin floor of the Boeing Model 777-300ER series airplane.

### **Discussion**

While the installation of a crew rest compartment is not a new concept for large transport category airplanes, each crew rest compartment has unique features based on design, location, and use on the airplane. The LLCR compartment is novel in that it will be located below the passenger cabin floor in the aft cargo compartment of the Boeing Model 777-300ER series airplane. Due to the novel or unusual features associated with the installation of a LLCR compartment, special conditions are considered necessary to provide a level of safety equal to that established by the airworthiness regulations incorporated by reference in the type certificates of these airplanes, as applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature.

Most of these special conditions come from § 25.819, but more stringent standards for fire protection and emergency egress are required because of design features and location of the LLCR compartment. The applicant should note that the FAA considers smoke or fire detection and fire suppression systems (including airflow management features that prevent hazardous quantities of smoke or fire extinguishing agent from entering any other compartment occupied by crewmembers or passengers) for crew rest compartments complex in terms of paragraph 6d of Advisory Circular (AC) 25.1309-1A, “System Design and Analysis,” dated June 21, 1988. In addition, the FAA considers failure of the crew rest compartment fire protection system (i.e., smoke or fire detection and fire suppression systems), in conjunction with a crew rest fire, to be a catastrophic event. Based on the “Depth of Analysis Flowchart” shown in figure 2 of AC 25.1309-1A, the depth of analysis should include both qualitative and quantitative assessments. Refer to paragraphs 8d, 9, and 10 of AC 25.1309-1A. Note that flammable fluids, explosives, or other dangerous cargo are prohibited from being carried in the crew rest areas.

The requirements to enable crewmembers’ quick entry to the crew rest compartment, and to locate a fire source, inherently places limits on the amount of baggage that may be carried and the size of the crew rest area. The FAA considers that the crew rest area must be limited to the stowage of crew personal luggage and must not be used for the stowage of cargo or passenger baggage. The design of such a system to include cargo or passenger baggage would require additional requirements to ensure safe operation.

Furthermore, the addition of galley equipment or a kitchenette incorporating a heat source (e.g., cook tops, microwaves, coffee pots, etc.), other than a conventional lavatory or kitchenette hot water heater within the LLCR compartment as defined in the “Novel or Unusual

Design Features” section, may require additional special conditions to be considered. A hot water heater is acceptable without need for special conditions.

Finally, amendment 25-38 modified the requirements of § 25.1439(a) by adding, “In addition, protective breathing equipment must be installed in each isolated separate compartment in the airplane, including upper and lower lobe galleys, in which crewmember occupancy is permitted during flight for the maximum number of crewmembers expected to be in the area during any operation.” The LLCR compartment is an isolated separate compartment, so § 25.1439(a) is applicable. However, the § 25.1439(a) protective breathing equipment (PBE) requirements for isolated separate compartments are not appropriate because the LLCR compartment is novel or unusual in terms of the number of occupants.

In 1976, when amendment 25-38 was adopted, small galleys were the only isolated compartments that had been certificated. Two crewmembers were the maximum expected to occupy those galleys.

This crew rest compartment can accommodate up to six crewmembers. This large number of occupants in an isolated compartment was not envisioned at the time amendment 25-38 was adopted. It is not appropriate for all occupants to don PBEs in the event of a fire because the first action should be to leave the confined space unless the occupant is fighting the fire. Taking the time to don the PBE would prolong the time for the emergency evacuation of the occupants and possibly interfere with efforts to extinguish the fire. These special conditions therefore provide procedures that establish a level of safety equivalent to the PBE requirements.

### **Operational Evaluations and Approval**

These special conditions outline requirements for flightcrew and cabin crew rest compartment design approvals (e.g., type design change or supplemental type certificate)

administered by the FAA's Aircraft Certification Service. Prior to operational use of a flight (cabin) crew rest compartment, the FAA's Flight Standards Service must evaluate the flight (cabin) crew sleeping quarters and rest facilities for operational suitability. Refer to §§ 91.1061(b)(1), 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 14 CFR part 91, 121, or 135.

To obtain an operational evaluation, the type design holder must contact the appropriate Aircraft Evaluation Group (AEG) in the Flight Standards Service and request an evaluation for operational suitability of the flightcrew sleeping quarters in their crew rest facility. Results of these evaluations should be documented and appended to the applicable Flight Standardization Board Report. 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 flight (cabin) crew rest compartment configuration that affect crewmember emergency egress, or any other procedures affecting the safety of the occupying crewmembers and related training requires a re-evaluation and approval. In the event of any design change that affects egress, safety procedures, or training, the applicant is responsible for notifying the FAA's AEG that a new crew rest facility evaluation is required.

All instructions for continued airworthiness (ICAs) will be submitted to the Seattle AEG for approval acceptance, including service bulletins, before issuance of the FAA modification approval.

These special conditions are similar to Special Conditions No. 25-752-SC, except the maximum occupancy is 6 rather than 10 occupants, and the supplemental oxygen requirements

have been expanded to include destination areas. The conditions provide an appropriate level of safety for the occupancy limit as only the size of the compartment volume will change to accommodate the occupants, but all other requirements for safety, fire suppression, and emergency evacuation will remain the same.

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.

### **Applicability**

As discussed above, these special conditions are applicable to the Boeing Model 777-300ER series airplane, as modified by GDC Technics. Should GDC Technics apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. T00001SE to incorporate 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 model series of airplanes, as modified by GDC Technics. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on the airplane.

### **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 777-300ER series airplanes, as modified by GDC Technics.

1. Occupancy of the LLCR compartment is limited to the total number of installed bunks and seats in each compartment. For each occupant permitted in the LLCR compartment, there must be an approved seat or berth able to withstand the maximum flight loads when occupied. The maximum occupancy in the LLCR compartment is six (6).
  - a. There must be appropriate placards displayed in a conspicuous place at each entrance to the LLCR compartment indicating the following information:
    - (1) The maximum number of occupants allowed;
    - (2) That occupancy is restricted to crewmembers who are trained in the evacuation procedures for the LLCR compartment;
    - (3) That occupancy is prohibited during taxi, take-off, and landing;
    - (4) That smoking is prohibited in the LLCR compartment; and
    - (5) That the LLCR compartment is limited to the stowage of personal luggage of crewmembers and must not be used for the stowage of cargo or passenger baggage.
  - b. There must be at least one ashtray located conspicuously on or near the entry side of any entrance to the LLCR compartment.
  - c. There must be a means to prevent passengers from entering the LLCR compartment in an emergency or when no flight attendant is present.

- d. There must be a means for any door installed between the LLCR compartment and the passenger cabin to be capable of being quickly opened from inside the compartment, even when crowding occurs at each side of the door.
  - e. For all doors installed in the evacuation routes, there must be a means to preclude anyone from being trapped inside a 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 compartment at any time.
2. There must be at least two emergency evacuation routes, which could be used by each occupant of the LLCR compartment to rapidly evacuate to the main cabin and could be closed from the main passenger cabin after evacuation.
- a. The routes must be located with one at each end of the LLCR compartment, or with two having sufficient separation within the LLCR compartment and between the routes to minimize the possibility of an event (either inside or outside of the LLCR compartment) rendering both routes inoperative.
  - b. The routes must be designed to minimize the possibility of blockage, which might result from fire, mechanical or structural failure, or from persons standing on top of or against the escape route. If an evacuation route utilizes an area where normal movement of passengers occurs, it must be demonstrated that passengers would not impede egress to the main deck. If a hatch is installed in an evacuation route, the point at which the evacuation route terminates in the passenger cabin should not be located where normal movement by passengers or crew occurs, such as in a main aisle, cross aisle, passageway, or galley complex. If such a location cannot be avoided, special consideration must be taken to ensure that the hatch or door can be

- opened when a person who is the weight of a 95<sup>th</sup> percentile male is standing on the hatch or door. The use of evacuation routes must not be dependent on any powered device. If there is low headroom at or near an evacuation route, provision must be made to prevent or to protect occupants of the LLCR compartment from head injury.
- c. Emergency evacuation procedures, including the emergency evacuation of an incapacitated crewmember from the LLCR compartment, must be established. All of these procedures must be transmitted to the operator for incorporation into its training programs and appropriate operational manuals.
  - d. There must be a limitation in the Airplane Flight Manual or other suitable means requiring that crewmembers be trained in the use of evacuation routes.
3. There must be a means for the evacuation of an incapacitated person (representative of a 95<sup>th</sup> percentile male) from the LLCR compartment to the passenger cabin floor.
- a. The evacuation must be demonstrated for all evacuation routes. A flight attendant or crew member (a total of one assistant within the LLCR compartment) may provide assistance in the evacuation. Up to three persons in the main passenger compartment may provide additional assistance.
  - b. For evacuation routes having stairways, the additional assistants may descend down to one-half the elevation change from the main deck to the LLCR compartment, or to the first landing, whichever is higher.
4. The following signs and placards must be provided in the LLCR compartment:
- a. At least one exit sign, which meets the requirements of § 25.812(b)(1)(i) must be located near each exit. However, a sign with reduced background area of no less than 5.3 square inches (excluding the letters) may be utilized, provided that it is installed

- such that the material surrounding the exit sign is light in color (e.g., white, cream, light beige). 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 also be acceptable.
- b. An appropriate placard that defines the location and the operating instructions for each evacuation route must be located near each exit;
  - c. Placards must be readable from a distance of 30 inches under emergency lighting conditions; and
  - d. The exit handles and the placards with the evacuation path operating instructions must be illuminated to at least 160 micro lamberts under emergency lighting conditions.
5. There must be a means for emergency illumination to be automatically provided for the LLCR compartment in the event of failure of the main power system of the airplane, or of the normal lighting system of the LLCR 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 for the occupants of the LLCR compartment to locate and transfer to the main passenger cabin floor by means of each evacuation route.
  - d. The illumination level must be sufficient to locate a deployed oxygen mask with the privacy curtains in the closed position for each occupant of the LLCR compartment.

6. There must be means for two-way voice communications between crewmembers on the flightdeck and crewmembers in the LLCR compartment. Section 25.785(h) requires flight attendant seats near required floor level emergency exits. Each such exit seat on the aircraft must have a public address microphone that allows two-way voice communications between flight attendants and crewmembers in the LLCR compartment. One microphone may serve more than one such exit seat, provided the proximity of the exits allows unassisted verbal communications between seated flight attendants.
7. There must be a means for manual activation of an aural emergency alarm system, audible during normal and emergency conditions, to enable crewmembers on the flightdeck and at each pair of required floor-level emergency exits to alert crewmembers in the LLCR compartment of an emergency. 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 for at least ten minutes after the shutdown or failure of all engines and auxiliary power units (APU), or the disconnection or failure of all power sources which are dependent on the continued operation of the engines and APUs.
8. There must be a means—readily detectable by seated or standing occupants of the LLCR compartment—which indicates when seat belts should be fastened. If there are no seats, at least one means, such as sufficient handholds, must be provided to cover anticipated turbulence. Seat-belt-type restraints must be provided for berths and must be compatible for the sleeping attitude during cruise conditions. There must be a placard on each berth requiring that seat belts must be fastened when the berth is occupied. If compliance with

any of the other requirements of these special conditions is predicated on specific head location, there must be a placard identifying the head position.

9. To provide a level of safety equivalent to that provided to occupants of a small isolated galley—in lieu of the requirements specified in § 25.1439(a) at amendment 25-38 that pertain to isolated compartments—the following equipment must be provided in the LLCR compartment:

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

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

10. A smoke-or-fire detection system or systems must be provided that monitors each occupiable area within the LLCR compartment, including those areas partitioned by curtains. Flight tests must be conducted to show compliance with this requirement. Each smoke-or-fire detection system must provide the following:

- a. A visual indication to the flightdeck within one minute after the start of a fire;
- b. An aural warning in the LLCR compartment; and

- c. A warning in the main passenger cabin. This warning must be readily detectable by a flight attendant, taking into consideration the positioning of flight attendants throughout the main passenger compartment during various phases of flight.
11. The LLCR compartment must be designed such that fires within it can be controlled without a crewmember having to enter the compartment, or be designed such that crewmembers equipped for firefighting have unrestricted access to the compartment. The time for a crewmember on the main deck to react to the fire alarm, to don the firefighting equipment, and to gain access must not exceed the time for the compartment to become smoke-filled, making it difficult to locate the source of the fire.
12. There must be a means provided to exclude hazardous quantities of smoke or extinguishing agent originating in the LLCR compartment from entering any other compartment occupied by crewmembers or passengers. This means must include the time periods during the evacuation of the LLCR compartment and, if applicable, when accessing the LLCR compartment to manually fight a fire. Smoke entering any other compartment occupied by crewmembers or passengers when the LLCR compartment is opened during an emergency evacuation must dissipate within five minutes after the LLCR compartment is closed. Hazardous quantities of smoke may not enter any other compartment occupied by crewmembers or passengers during subsequent access to manually fight a fire in the LLCR compartment. (The amount of smoke entrained by a firefighter exiting the LLCR compartment through the access is not considered hazardous.) During the one-minute smoke detection time, penetration of a small quantity of smoke from the LLCR compartment into an occupied area is acceptable. Flight tests must be conducted to show compliance with this requirement. If a built-in fire

suppression system is used in lieu of manual firefighting, the fire suppression system must be designed so that no hazardous quantities of extinguishing agent will enter other compartments occupied by passengers or crewmembers. The system must have adequate capacity to suppress any fire occurring in the LLCR compartment, considering the fire threat, the volume of the compartment, and the ventilation rate.

13. For each seat and berth in the LLCR compartment, there must be a supplemental oxygen system equivalent to that provided for main deck passengers. If a destination area (such as a changing area) is provided, there must be an oxygen mask 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 designation area). The system must provide an aural and visual warning to alert the occupants of the LLCR compartment of the need to don oxygen masks in the event of decompression. The warning must activate before the cabin pressure altitude exceeds 15,000 feet. The aural warning must sound continuously for a minimum of five minutes or until a reset push button in the LLCR compartment is depressed. Procedures for crewmembers in the LLCR compartment to follow in the event of decompression must be established. These procedures must be transmitted to the operator for incorporation into their training programs and appropriate operational manuals.
14. The following requirements apply to LLCR compartments that are divided into several sections by the installation of curtains or doors:
  - a. To warn crewmembers who may be sleeping, there must be an aural alert that accompanies automatic presentation of supplemental oxygen masks. The alert must

- be audible in each section of the LLCR compartment. A visual indicator that occupants must don an oxygen mask is required in each section where seats or berths are not installed. A minimum of two supplemental oxygen masks are required for each seat or berth. There must also be a means to manually deploy the oxygen masks from the flightdeck.
- b. A placard is required adjacent to each curtain that visually divides or separates the LLCR compartment into small sections for privacy purposes. The placard must indicate that the curtain is to remain open when the private section it creates is unoccupied.
  - c. For each section of the LLCR compartment created by the installation of a curtain, the following requirements of these special conditions must be met with the curtain open and with the curtain closed:
    - (1) Emergency illumination (condition 5);
    - (2) Aural emergency alarm (condition 7);
    - (3) Fasten-seat-belt signal or return-to-seat signal as applicable (condition 8); and
    - (4) Smoke or fire detection system (condition 10).
  - d. Crew rest compartments visually divided to the extent that evacuation could be affected must have exit signs that direct occupants to the primary stairway exit. The exit signs must be provided in each separate section of the LLCR compartment, and must meet the requirements of § 25.812(b)(1)(i). An exit sign with reduced background area as described in condition 4(a) may be used to meet this requirement.

- e. For sections within an LLCR compartment that are created by the installation of a partition with a door separating the sections, the following requirements of these special conditions must be met with the door open and with the door closed:
- (1) There must be a secondary evacuation route from each section to the main deck, or it must be shown that any door between the sections has been designed to preclude anyone from being trapped inside the compartment. Removal of an incapacitated crewmember from this area must be considered. A secondary evacuation route from a small room designed for only one occupant for a short period of time, such as a changing area or lavatory, is not required. However, removal of an incapacitated occupant from this area 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) There may be no more than one door between any seat or berth and the primary stairway exit.
  - (4) There must be exit signs in each section meeting the requirements of § 25.812(b)(1)(i), that direct occupants to the primary stairway exit. An exit sign with reduced background area, as described in condition 4(a), may be used to meet this requirement.
  - (5) Condition 5 (emergency illumination), 7 (aural emergency alarm), 8 (fasten seat belt signal or return to seat signal as applicable) and 10 (smoke and fire detection) must be met both with the door open and the door closed.

- (6) Condition 6 (two-way voice communication) and 9 (PBE and other equipment) must be met independently for each separate section, except in lavatories or other small areas that are not intended to be occupied for extended periods of time.
15. Where a waste disposal receptacle is fitted, it must be equipped with a built-in fire extinguisher designed to discharge automatically upon occurrence of a fire in the receptacle.
16. Materials, including finishes or decorative surfaces applied to the materials, must comply with the flammability standards of § 25.853(a). Mattresses must comply with the flammability standards of § 25.853(c).
17. A lavatory within the LLCR compartment must meet the same requirements as a lavatory installed on the main deck, except with regard condition 10 for smoke detection.
18. When a LLCR compartment is installed or enclosed as a removable module in part of a cargo compartment, or is located directly adjacent to a cargo compartment without an intervening cargo compartment wall, the following conditions apply:
- a. Any wall of the LLCR compartment, which forms part of the boundary of the reduced cargo compartment and is subject to direct flame impingement from a fire in the cargo compartment and any interface item between the LLCR compartment and the airplane structure or systems, must meet the applicable requirements of § 25.855.
  - b. Means must be provided to ensure that the fire protection level of the cargo compartment meets the applicable requirements of §§ 25.855, 25.857, and 25.858 when the LLCR compartment is not installed.
  - c. Use of each emergency evacuation route must not require occupants of the LLCR compartment to enter the cargo compartment to return to the passenger compartment.

d. The aural emergency alarm specified in condition 7 must sound in the LLCR compartment in the event of a fire in the cargo compartment.

19. Means must be provided to prevent access into the Class C cargo compartment—whether or not the LLCR is installed—during all airplane flight operations and to ensure that the maintenance door is closed and secured during all airplane flight operations.

20. All enclosed stowage compartments within the LLCR compartment that are not limited to stowage of emergency equipment or airplane supplied equipment (i.e., bedding), must meet the design criteria in the table below. As indicated in the table below, enclosed stowage compartments larger than 200 ft<sup>3</sup> 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 fire extinguisher, will require additional fire protection considerations similar to those required for inaccessible compartments such as Class C cargo compartments.

Fire Protection Features	Stowage Compartment Interior Volumes		
	Less than 25 ft <sup>3</sup>	25 ft <sup>3</sup> to less than 57 ft <sup>3</sup>	57 ft <sup>3</sup> to 200 ft <sup>3</sup>
Materials of construction <sup>1</sup>	Yes	Yes	Yes
Detectors <sup>2</sup>	No	Yes	Yes
Liner <sup>3</sup>	No	No	Yes
Locating device <sup>4</sup>	No	Yes	Yes

<sup>1</sup>Material: The material used to construct each enclosed stowage compartment must at least be fire resistant and must meet the flammability standards established for interior components per the requirements of § 25.853. For compartments less than 25 ft<sup>3</sup> in interior volume, the design must ensure the ability to contain a fire likely to occur within the compartment under normal use.

<sup>2</sup>Detectors: Enclosed stowage compartments equal to or exceeding 25 ft<sup>3</sup> 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 flightdeck within one minute after the start of a fire;
- b. An aural warning in the LLCR compartment; and
- c. A warning in the main passenger cabin. This warning must be readily detectable by a flight attendant, taking into consideration the positioning of flight attendants throughout the main passenger compartment during various phases of flight.

<sup>3</sup>Liner: If it can be shown that the material used to construct the stowage compartment meets the flammability requirements of a liner for a Class B cargo compartment, no liner would be required for enclosed stowage compartments equal to or greater than 25 ft<sup>3</sup> but less than 57 ft<sup>3</sup> in interior volume. For all enclosed stowage compartments equal to or greater than 57 ft<sup>3</sup> but less than or equal to 200 ft<sup>3</sup> in interior volume, a liner must be provided that meets the requirements of § 25.855 for a Class B cargo compartment.

<sup>4</sup>Location Detector: LLCR compartments which contain enclosed stowage compartments with an interior volume exceeding 25 ft<sup>3</sup> and which are located away from one central location such as the entry to the LLCR compartment or a common area within the LLCR compartment would require additional fire protection features or devices to assist the firefighter in determining the location of a fire.

Issued in Des Moines, Washington, on March 17, 2020.

James E. Wilborn

Acting Manager, Transport Standards Branch,

Policy and Innovation Division,

Aircraft Certification Service.

[FR Doc. 2020-06025 Filed: 3/24/2020 8:45 am; Publication Date: 3/25/2020]