

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

In the matter of the petition of

THE BOEING COMPANY

for an exemption from §§ 25.785(d),
25.807(c)(1), 25.807(c)(5), 25.807(d)(1),
25.809(f)(1), 25.813(b), 25.857(e), and
25.1447(c)(1) of Title 14, Code of Federal
Regulations

Regulatory Docket No. FAA-2008-0348

PARTIAL GRANT OF EXEMPTION

By letter dated February 8, 2008, D. B. Marcrauder, Lead Project Administrator, Puget Sound, The Boeing Company, PO Box 3707, Seattle, Washington, petitioned the Federal Aviation Administration for an exemption from the following sections of Title 14, Code of Federal Regulations (14 CFR): 25.785(d), 25.807(c)(1), 25.807(c)(5), 25.807(d)(1), 25.809(f)(1), 25.813(b), 25.857(e), and 25.1447(c)(1). By letter dated June 24, 2008, C.M. Thompson, Lead Project Administrator, Development Projects, submitted supplemental information for the petition. The requested exemption, if granted, would permit relief from these regulations to allow carriage of six non-crewmembers (commonly referred to as supernumeraries) in a compartment behind the flight deck on Boeing Model 747-8F airplanes.

The applicant petitioned for an exemption from the "...one Type IV passenger emergency exits be provided in each side of the fuselage" requirement in § 25.807(c)(1) at Amendment 25-67. However, in the certification basis for Boeing Model 747-8F airplanes, this requirement is in § 25.807(g)(1) at Amendment 25-114, not § 25.807(c)(1).

The applicant petitioned for an exemption from the "...at least a pair of Type III emergency exits be provided if Type IV exits are specified and they cannot be located

over the wing” requirement in § 25.807(c)(5) at Amendment 25-67. However, in the certification basis for Boeing Model 747-8F airplanes, this requirement is in § 25.807(g)(1) at Amendment 25-114, not § 25.807(c)(5).

The applicant petitioned for an exemption from the “...passenger seating configuration, excluding pilots seats, of nine seats or less, one exit above the waterline in” requirement in § 25.807(d)(1) at Amendment 25-67. However, in the certification basis for Boeing Model 747-8F airplanes, this requirement is in § 25.807(i)(1) at Amendment 25-114, not § 25.807(d)(1).

The applicant petitioned for an exemption from “...a self-supporting escape slide or equivalent be provided as the assist means at passenger emergency exits that are more than six (6) feet from the ground with all landing gear extended” requirement in § 25.809(f)(1) at Amendment 25-47. However, in the certification basis for Boeing Model 747-8F airplanes, this requirement is in § 25.810(a)(1)(iii) at Amendment 25-114, not § 25.809(f)(1).

The petitioner requests relief from the following regulations:

Section 25.785(d), at Amendment 25-64, states, “If the seat backs do not provide a firm hand hold, there must be a hand grip or rail along each aisle to enable occupants to steady themselves while using the aisles in moderately rough air.”

Section 25.807(g)(1), at Amendment 25-114, requires that one Type IV passenger emergency exit be provided in each side of the fuselage.

Section 25.807(g)(1), at Amendment 25-114, requires that at least a pair of Type III emergency exits be provided if Type IV exits are specified and they cannot be located over the wing.

Section 25.807(i)(1), at Amendment 25-114, states, “For airplanes that have a passenger seating configuration, excluding pilots seats, of nine seats or less, one exit above the waterline in each side of the airplane, meeting at least the dimensions of a Type IV exit.”

Section 25.810(a)(1)(iii), at Amendment 25-114, requires that a self-supporting escape slide or equivalent be provided as the assist means at passenger emergency exits that are more than six (6) feet from the ground with all landing gear extended.

Section 25.813(b), at Amendment 25-46, states, “For each passenger emergency exit covered by § 25.809(f), there must be enough space next to the exit to allow a crewmember to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required for the exit.”

Section 25.857(e), at Amendment 25-93, limits a Class E cargo compartment to airplanes used only for the carriage of cargo.

Section 25.1447(c)(1), at Amendment 25-41 requires, in pertinent part, that oxygen dispensing units must be automatically presented to the occupants before the cabin altitude exceeds 15,000 feet.

Related sections of 14 CFR

Section 121.583(a) contains, in pertinent part, a listing of categories of persons who may be carried aboard an airplane in part 121 service without complying with all the requirements of part 121 pertaining to carriage of passengers.

The petitioner supports its request with the following information:

The following information summarizes the petition submitted by The Boeing Company. The complete petition is available on the Federal Docket Management System website at www.regulations.gov. The docket number is FAA-2008-0348.

The Model 747-8F is a derivative airplane based on the Model 747-400F. Relative to the 747-400F, the 747-8F is 220 inches longer. The main deck of the airplane is a Class E cargo compartment. The upper deck of the airplane includes the flight deck and the supernumerary seating area. This exemption, if granted, would allow the carriage of up to six supernumeraries on the upper deck of the airplane and in-flight access into the main deck cargo compartment to care for live animals requiring care/attention during flight or for the inspection/care of the hazardous materials, and valuable or perishable goods.

The exemption from § 25.857(e) is necessary because the regulation precludes the carriage of persons other than crew on airplanes with a Class E cargo compartment. This exemption is needed to support the type of operations that include the carriage of live animals requiring care/attention during flight, hazardous materials, and valuable or perishable goods.

The exemption from § 25.807(g)(1) is necessary because there is not an exit on each side of the fuselage. The airplane is equipped with one Type I exit on the right side and an overhead hatch located on the flight deck. In addition, an exemption from § 25.807(g)(1) is needed because the overhead hatch that is provided does not meet the minimum size requirements for a Type III emergency exit. Also, an exemption from § 25.807(i)(1) is necessary because the overhead hatch that is provided does not meet the minimum size requirements for a Type IV ditching exit.

The exemption from § 25.813(b) is necessary because an assist space is not available near the Type I emergency exit.

The exemption from § 25.810(a)(1)(iii) is necessary for the basic airplane because the assist means provided is not a self-supporting escape slide or equivalent. For the basic airplane there are eight inertia reel descent devices provided for use to exit through either the overhead hatch or the Type I emergency exit located on the right side of the airplane. As a customer option a manually deployed and inflated escape slide is installed at the right hand emergency exit. This escape slide is not usable under certain landing gear collapse conditions but is usable for the all landing gear extended configuration.

The exemption from § 25.785(d) is necessary when access to the cargo compartment is needed because firm handholds are not available in the cargo compartment.

The exemption from § 25.1447(c)(1) is necessary because automatically dispensing oxygen units are not available inside the main deck cargo compartment. Each person entering the cargo compartment will carry portable oxygen and a mask.

The airplane operations that would require supernumeraries to enter the Class E cargo compartment are divided into three types. They are:

1. Carriage of live animals requiring care/attention during flight and associated material only, no other cargo.
2. Cargo only, no live animals requiring care/attention during flight carriage.
3. Carriage of live animals requiring care/attention during flight and cargo.

For all three types of operation it is proposed that six supernumeraries be allowed in the Class E cargo compartment in-flight.

Public Interest

The level of safety would not be compromised in comparison with similar existing freighter airplane designs. The worldwide demand for shipment of goods by air cargo continues to grow and the configuration of the 747-8F is intended to help meet this demand as economically as possible while providing appropriate safety features. Cargo operators may be able to reduce the airplane turn-around time, which supports the public's interest by virtue of lower consumer costs for shipping air cargo.

Use of inertia reel descent devices as the primary assist means will translate into operational cost savings. First, the on-going maintenance costs associated with the escape slide will stop; second, the airplane operating costs will be reduced

because the airplane will be lighter with the escape slide removed, resulting in fuel cost savings; and third, reduced maintenance costs associated with inadvertent escape slide deployments.

Federal Register publication

A summary of the petition was published in the *Federal Register* on July 28, 2008 (73 FR 43816). The FAA received comments from Cathay Pacific Airways Ltd.

Cathay Pacific Airlines fully supports this petition for exemption.

The FAA's analysis

The FAA considers the petitioner's proposal for the exemption to be in the public interest for the following reasons:

The FAA has granted several exemptions for the carriage of supernumeraries on freighter airplanes;

These supernumeraries are seen as a benefit to airplane safety and efficient operations of air cargo; and

A significant disruption of air commerce could occur if the petition were not granted.

Class E cargo compartments are usually remote from the flight deck and encompass the entire interior of the airplane. The means of controlling fires that might occur in the cargo compartment is to starve the fire of oxygen. This is accomplished by depressurizing the airplane and maintaining an altitude that will not support combustion. For this reason, only crewmembers are permitted on board such airplanes.

The certification regulations for transport category airplanes address airplane occupants as being either "crew" or "passengers." Due to differences in training, physical capabilities, and other factors (such as familiarity with the airplane), the means required by part 25 to address emergency evacuation and emergency equipment for passengers and crewmembers differ. Because supernumeraries are not crewmembers, they must be considered "passengers" by default with respect to part 25. However, supernumeraries do hold a special status because of their training and other factors. The FAA, therefore, has granted certain exemptions to allow the carriage of supernumeraries on cargo airplanes without compliance with all of the part 25 standards for passengers, provided that certain other conditions are met. Those conditions have varied, depending on the airplane design, the nature of the proposals under consideration, and the number and location of persons to be carried.

The FAA has previously granted exemptions for carriage of persons in addition to crew on freighter airplanes and allowed access to the cargo compartment, provided that certain

other conditions are met. These conditions have varied depending on the airplane design, the number of persons involved, and the type of cargo permitted to be transported in the main deck Class E cargo compartment.

For handholds, the requirement of § 25.785(d) at Amendment 25-64 is to ensure that occupants have a means to steady themselves in moderately rough air while traversing the main aisles of typical passenger airplanes. On the proposed airplane, we concur with the petitioner that it is not necessary to provide dedicated handholds in the cargo compartment because it is impractical, provided a flightcrew operated aural or visual alerting system, which is recognized in accessible areas in the Class E cargo compartment, is installed to indicate, during turbulence, that persons must return to their seats. The petitioner has proposed that the visual portion of the alerting system be manually activated by a flight deck crewmember to alert the supernumeraries in the cargo compartment of turbulence.

The proposal for an inertia reel and harness as a means of emergency egress has been reviewed and found acceptable on previous exemptions, as described by the petitioner. The FAA recognizes that supernumerary occupants, as opposed to passengers, may be selected and trained appropriately in the use of inertia reels and harnesses. For such occupants, both ambulatory and incapacitated, the FAA considers that inertia reels and harnesses offer an acceptable escape means of emergency egress. As with escape slides, the inertia reels and harnesses must be of such a length to safely assist the occupant to the ground considering the range of sill heights for both exits considering the collapse of one or more legs of the landing gear. The FAA concludes that inertia reels and harnesses for a limited application of this nature can provide an acceptable level of safety to that provided by escape slides. The applicant is proposing to install six harnesses in the airplane (one for each supernumerary) rather than enough for each occupant of the airplane. We do not agree with that proposal and will require one harness for each occupant. We considered this necessary to provide an acceptable level of safety to escape slides.

In an optional configuration, Boeing has proposed to install an escape slide at the crew service door. The escape slide is not automatically deployed and is not self supporting on the ground after the collapse of one or more legs of the landing gear. The petitioner did not provide any supporting information or rationale to support its proposal to install an escape slide that is not automatically deployed and is not self supporting on the ground after the collapse of one or more legs of the landing gear. In the public interest statement provided the applicant discusses the use of inertia reels and harness as the primary assist means for the airplane. With the information provided we are not able to grant the exemption for the escape slide as requested by the applicant. The applicant may submit a petition to reconsider this issue in the future with the additional information needed to address our concerns.

In all cases, there must be suitable means for preventing smoke penetration into areas that are occupied. The petitioner's design accounts for this by providing a barrier, which must comply with the smoke penetration requirements for the flight deck and the

supernumerary compartment. However, the petitioner has indicated that configurations may be approved that will allow supernumeraries to enter the Class E cargo compartment and hence open the smoke barrier between the cargo compartment and the supernumerary compartment. In order to provide an appropriate level of safety, the petitioner must install a placard indicating that the smoke barrier is to be secured (i.e., the door or curtain must be closed) except when entering or exiting the cargo compartment. The placard must be located in the supernumerary compartment in a conspicuous place, either on or next to the smoke barrier.

Another concern associated with supernumeraries having access to the cargo compartment in-flight is the amount of smoke that would enter into the supernumerary compartment and flight deck as a result of the smoke barrier being open during the evacuation of the cargo compartment by the supernumeraries in the event of smoke/fire. This smoke source must be considered when demonstrating compliance with § 25.855.

If access into the Class E cargo compartment is allowed, the petitioner has proposed that aural and visual alerting systems that are both automatically activated and recognized in the Class E cargo compartment be installed to indicate that persons must return to their seats and secure the smoke barrier (i.e., close the door or curtain) during a fire in the Class E cargo compartment. Appropriate procedures and limitations would need to be established to ensure that the flightcrew alerting system notifies the supernumeraries to return to their seats and secure the smoke barrier at the onset of a fire. The pre-flight briefing would need to explain this alerting system to the supernumeraries. The petitioner proposed that the supernumeraries inside the Class E cargo compartment would immediately don their oxygen masks, initiate flow, and then immediately return to their seats in the event of smoke being detected inside the Class E cargo compartment. For certain types of cargo operations, where the type of operation (i.e., mixed cargo and live animals) or a large number of supernumeraries (four or more), or difficult exit routes (e.g., ladders or unusual stairway design) adversely affect the time to exit the compartment, the FAA agrees that the supernumeraries must be afforded a means to protect themselves from smoke inhalation. In other cases, donning an oxygen full face mask or smoke hood/PBE and initiating oxygen flow may take up valuable time that is better spent on exiting the Class E cargo compartment. Therefore, in the event of smoke being detected inside the Class E cargo compartment, the supernumeraries inside the Class E cargo compartment should be instructed to immediately return to their seats and secure the smoke barrier. In cases where the same alerts are used for smoke events and decompressions donning equipment that provides hypoxia protection is a priority.

Due to the way that fire in the cargo compartment is to be controlled, it is necessary to limit persons on board the airplane to those who have been found physically fit by the operator and have been briefed on the use of the emergency equipment. This limitation on the occupants is consistent with previous approvals and is included in this approval.

The petitioner indicates that configurations may be approved that will allow the supernumeraries to enter the Class E cargo compartment to tend to animals or hazardous cargo. In order to provide an acceptable level of safety to the “immediately available”

requirement of § 25.1447(c)(1), while in the Class E cargo compartment, each supernumerary must carry on his or her person a portable oxygen bottle with a mask connected to it.

Section 25.1447(c)(1) also requires automatic presentation of the oxygen dispensing units. For seated passengers in typical passenger airplanes, the automatic presentation of masks throughout the cabin indicates the need to don an oxygen mask. However, supernumeraries in the Class E cargo compartment will not have this indication. To provide an acceptable level of safety, the petitioner proposed an automatically activated visual and aural decompression alerting system immediately recognizable throughout the accessible areas in the Class E cargo compartment.

Supernumeraries must be trained regarding the location and use of the oxygen equipment and its associated alerting systems. The oxygen units must be sized adequately for continuous and uninterrupted use during worst-case flight duration following decompression. Additionally, the portable oxygen device must meet the requirements for flightcrew oxygen masks (§ 25.1443(a) or (b)) or the equipment must be shown to protect the supernumerary from hypoxia at an activity level required to return to his or her seat following a rapid decompression to 25,000 feet cabin altitude.

Configurations may be approved for carrying cargo, which would not require supernumeraries to access the Class E cargo compartment. For these configurations, an aural decompression alerting system is not required to be recognizable in the Class E compartment if an Airplane Flight Manual limitation is established to prohibit supernumeraries from being in the Class E cargo compartment during flight.

The FAA has previously granted exemptions for in-flight access of the Class E cargo compartment by supernumeraries, provided that certain other conditions are met. These conditions have varied, depending on the airplane design, the number of persons involved, and the type of cargo permitted to be transported in the main deck Class E cargo compartment. We have been reviewing the operational need to access the Class E cargo compartment in-flight and the number of persons needed in the cargo compartment for the type of operation. We have divided the access into the cargo compartment into three different types of operations. They are:

1. Carriage of live animals requiring care/attention during flight and associated material only, no other cargo.
2. Cargo only, no live animal requiring care/attention during flight carriage.
3. Carriage of live animals requiring care/attention during flight and cargo.

All large animals being shipped by air need supernumeraries on board for their care/attention during flight because the carriage of large animals implies a potential risk due to the brute force they are capable of, which can endanger flight safety. Horses are routinely shipped by air and are one of the large animals that require care/attention during

flight because of the brute force issue. Also, these horses are high value animals and the owners/insurance policies require in-flight care/attention. We understand that there is an industry standard for the air transport of horses that recommends that there be one supernumerary (groom/handler) for every three or four horses. We agree that this recommendation is appropriate to ensure safety of flight.

In the first type of operation, considering the size of the 747-8F airplane, there could be several dozen horses in the main deck cargo compartment. As a result of the large number of horses or other large animals, and the industry standard noted above, a large number of supernumeraries (grooms/handlers) would be needed. We have granted exemptions in the past for larger number of supernumeraries with access into the main deck Class E cargo under certain conditions. These conditions have included limiting the permitted cargo to the large live animals and associated cargo only. We have considered that live animals are less flammable cargo than other cargo, therefore, we have allowed more access to the cargo compartment. The petitioner has requested a maximum of six supernumeraries be allowed to access the main deck Class E cargo compartment in-flight for the care/attention of live animals. We accept the proposal.

With regard to the second type of operation, we have limited the access to the main deck Class E cargo compartment to a very small number of supernumeraries (three). This number of supernumeraries should be capable of addressing the access needs for the hazardous materials and valuable or perishable goods. The petitioner queried 30 operators of cargo airplanes and all but one operator agreed that three supernumeraries with access in to the Class E cargo compartment was adequate for this type of operation. The petitioner requested six supernumeraries be allowed to access the main deck Class E cargo compartment in-flight for the inspection of cargo. Based on the information from the operators of these types of airplanes, provided by the petitioner, a maximum of three supernumeraries are allowed to access the main deck Class E cargo compartment in-flight to inspect the cargo.

Concerning the third type of operation, live animals requiring care/attention during flight and cargo, we understand this is the most common operation used for transporting horses. The industry standard for carriage of horses is one supernumerary for every three or four horses. The petitioner has requested a maximum of six supernumeraries be allowed to access the main deck Class E cargo compartment in-flight for the care/attention of live animals and/or inspection of cargo. We accept the proposal for a maximum of six supernumeraries to be allowed access to the main deck Class E cargo compartment in-flight for the care/attention of live animals and/or to inspect the cargo with the following limitation:

The addition of cargo to a live animals carriage operation causes additional risk of exposure from the smoke and fumes of a fire. As the number of supernumeraries increases, and the duration of exposure increases, we must provide for a reasonable level of protection from smoke inhalation. Several factors are considered when making a determination of the acceptable level of safety in this case. Past industry practice, the number of supernumeraries

with access, the airplane configuration, cargo compartment size, limited egress paths, potential cargo present, and the duration of exposure are all relevant factors. Considering the above factors, in the general case, if Class E cargo compartment access is approved for four or more supernumeraries for this mode of operation, a portable system (e.g., smoke hood or full face mask oxygen unit) must be carried by each supernumerary.

However, in the case of the Model 747-8 freighter airplanes, because the petitioner has proposed to provide the same alert for both decompression and smoke/fire, a single system that affords protection from both hypoxia and smoke inhalation (e.g., a full face mask and oxygen unit) must be used instead of separate systems. This single system must be used in any of the three types of cargo operations and by every supernumerary that enters the Class E cargo compartment.

Another concern is the removal of an incapacitated person from the cargo compartment. This concern is increased since the access means to the main deck cargo compartment is a ladder. Boeing should develop procedures for the removal of an incapacitated person from the cargo compartment and provide them to the airplane operator. There is no need to combine this condition with any other failure condition (i.e., only normal flight condition needs to be considered).

The FAA's decision

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator, The Boeing Company is hereby granted a partial exemption from 14 CFR 25.785(d), 25.807(g)(1), 25.807(i)(1), 25.810(a)(1)(iii), 25.813(b), 25.857(e), and 25.1447(c)(1) to the extent necessary to allow type certification of Boeing Model 747-8F series airplanes with provisions for the carriage of supernumeraries. The following limitations apply and limitation numbers 1-6 and 10-11 must be documented in the Limitations Section of the Airplane Flight Manual:

1. A maximum of six supernumeraries may occupy the area just aft of the flight deck. The total maximum occupancy of the airplane is limited to eight persons, including the flight crew.
2. The supernumeraries are limited to the categories specified in §§ 121.583(a)(1) through 121.583(a)(7).
3. Main Deck Class E Cargo Compartment Access Limitations:
 - a. Supernumeraries are prohibited from being in the cargo area during taxi, take-off, and landing. The pre-flight briefing must inform supernumeraries of this requirement.

b. Access into the main deck Class E cargo compartment in-flight is allowed for only three types of operation. They are:

- Carriage of live animals requiring care/attention during flight and associated material only, no other cargo. The maximum number of supernumeraries allowed in the main deck Class E cargo compartment is six.
- Cargo only, no live animal requiring care/attention during flight. The maximum number of supernumeraries allowed in the main deck Class E cargo compartment is three.
- Carriage of live animals requiring care/attention during flight and other cargo. The maximum number of supernumeraries allowed in the main deck Class E cargo compartment is six.

4. Prior to each flight, a flightcrew member must brief the supernumeraries on the following:

- the use of exits, including instructions to inspect the ground to determine whether a safe landing can be achieved before using an assist means.
- location and use of emergency equipment.
- the prohibition from being in the cargo area during taxi, take-off, and landing.
- the aural and visual decompression alerting system and what actions they are required to take.
- the visual turbulence alerting system and the requirement that persons must return to their seats.
- the aural and visual fire or smoke alerting system and what actions they are required to take.
- that access is limited to the care and handling of animals and cargo only.
- that access is limited to a maximum of three unless live animals requiring care/attention in-flight and associated material are being carried.
- that access is limited to a maximum of six when live animals requiring care/attention in-flight are being carried.

- that the smoke barrier must be secured (i.e., the door or curtain must be closed) except when entering or leaving the cargo compartment.
 - that a portable oxygen bottle (with full face mask attached) must be carried at all times when accessing the cargo compartment by each person entering the cargo compartment.
 - that smoking is not allowed within the cargo compartment.
 - that the compartment must not be entered in case of fire/smoke being detected inside the Class E cargo compartment.
5. The operator must determine that each supernumerary is physically able and trained to accomplish the necessary emergency procedures.
6. Supernumeraries Portable Oxygen:
- a. There must be at least one portable oxygen unit with a mask attached to it provided for each supernumerary allowed to enter the main deck Class E cargo compartment during flight. The unit must provide an indication to the user that oxygen is flowing.
 - b. The portable oxygen unit must meet the performance requirements of § 25.1443(a) or § 25.1443(b), or the equipment must be shown to protect the supernumerary from hypoxia at an activity level required to return to his or her seat following a rapid decompression to 25,000 feet cabin altitude.
 - c. During flight, the supernumerary must carry the portable oxygen unit whenever he or she is in the Class E cargo compartment.
 - d. The supernumeraries must be trained in the use of the oxygen units. The supernumeraries must also be trained in making the determination whether oxygen is being delivered to the dispensing units.
 - e. The oxygen units must be sized adequately for continuous and uninterrupted use during worst-case flight duration following decompression, or must be of sufficient duration to allow the supernumeraries to return to their seats where oxygen is readily accessible for the remainder of the decompression.
 - f. Additionally, since the petitioner has decided to provide the same alert for both decompression and smoke/fire, the oxygen unit must meet the protective breathing equipment (PBE) requirements in §§ 25.1439(b)(1), (2)(i), and (4), and the equipment and system must be designed to prevent any inward leakage to the inside of the device and prevent any outward leakage causing

significant increase in the oxygen content of the local atmosphere (i.e., full face mask type.)

7. An automatically activated aural and visual decompression alerting system must be present and immediately recognizable in accessible areas of the Class E cargo compartment to notify supernumeraries when to don oxygen masks. If there are two or more alerts that a supernumerary may hear or is expected to respond to there must be an automatic visual alert in addition to the automatic aural alert. The pre-flight briefing must include training in the sound of the alerting system, the meaning of the alerting system, and the response to the signal (i.e., procedures for donning the masks and activating the flow of oxygen).

8. Turbulence Alert:

A flightcrew operated visual alerting system, which is recognized in accessible areas in the Class E cargo compartment, must be installed to indicate, during turbulence, that persons must return to their seats. Appropriate procedures and limitations must be established to ensure that the flightcrew alerting systems notify the supernumeraries to return to their seats at the onset of turbulence and prior to landing. The pre-flight briefing must explain this alerting system to the supernumeraries.

9. Smoke/Fire Alert:

A flightcrew activated aural and visual alerting system, which is recognized in the Class E cargo compartment, must be installed. This aural or visual alerting system is to indicate that, in the event of fire or smoke in the Class E cargo compartment, persons must return to their seats and ensure that the smoke barrier is secured (i.e., the door or curtain is closed). Appropriate procedures and limitations must be established to ensure that, at the onset of a fire or smoke event, the flightcrew alerting systems the supernumeraries to return to their seats and secure the smoke barrier. The pre-flight briefing must explain these alerting systems to the supernumeraries.

10. Placards:

Placards are to be located in the supernumerary area, in a conspicuous location either on or adjacent to the smoke barrier doors. The placards must indicate the following:

- Access is limited to the care and handling of animals and cargo only.
- Access is limited to a maximum of three unless live animals requiring care/attention in-flight and associated material are being carried.
- The smoke barrier must be secured (i.e., the door or curtain must be closed) except when entering or leaving the cargo compartment.
- A portable oxygen bottle (with full face mask attached) must be carried at all times when accessing the cargo compartment by each person entering the cargo compartment
- Smoking is not allowed within the cargo compartment.
- The compartment must not be entered in case of fire/smoke being detected inside the Class E cargo compartment.
- Do not occupy the Class E cargo compartment during taxi, takeoff, and landing.

11. Alerting requirements:

- Must be distinctive and effective.
- Visual alerts must be visible from all occupant locations and orientations, during all expected operational conditions including a rapid decompression where moisture in the air may condense.
- Aural alerts must be loud enough to be heard during all expected operational conditions including a rapid decompression where the ambient noise level will increase.

12. For the exits designated for supernumerary use emergency lighting must provide adequate illumination at the ground end of the assist means, where an evacuee would normally make first contact with the ground, with the airplane in each of the attitudes corresponding to the collapse of one or more legs of the landing gear and worse case center of gravity location.

13. There must be eight inertia reels and harnesses installed on the flight deck. No flight deck door may be installed between the supernumerary compartment and the flightdeck that would prevent access to the overhead hatch and eight inertia reels and harnesses. In accordance with FAA-approved test plan(s), the intended inertia reels and harnesses must be demonstrated to be a suitable assist means for the expeditious and safe evacuation of the maximum number of trained occupants allowed by approved seating. This/these demonstration(s) should also address to the satisfaction of the FAA the capability of trained occupants to utilize the intended inertial reels and harnesses to safely and expeditiously evacuate incapacitated occupants. Additionally, this/these demonstration(s) should also address to the satisfaction of the FAA the suitability of the intended devices from both high and low sill heights representative of § 25.810(a)(1)(iii) gear-collapse conditions including worse case center of gravity location.
14. For all cargo or mixed cargo and live animal operations involving four or more supernumeraries, a portable system that protects against smoke inhalation must be provided. A portable system (e.g., smoke hood, full face mask oxygen system, etc.) that affords protection from smoke inhalation must be carried at all times when accessing the cargo compartment. Note that a single system that meets both protection from smoke inhalation and hypoxia could be used (e.g., a full face mask with oxygen unit).
15. Flight tests must be conducted to show compliance with the provisions of § 25.857 concerning the entry of hazardous quantities of smoke into compartments occupied by the crew or passengers. The amount of time that the smoke barrier is open, as a result of the supernumeraries evacuating the main deck cargo compartment, must be accounted for in the testing.

Note: The briefings and associated procedures in limitations 7, 8, and 9 are not required if an Airplane Flight Manual limitation is established to prohibit supernumeraries in the Class E cargo compartment during flight. If access is prohibited, placards must be revised to indicate this limitation.

Issued in Renton, Washington, on November 26, 2008.

Signed by Ali Bahrami

Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service