

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

In the matter of the petition of

**Alegre Equine Corporation**

for an exemption from §§ 25.785(j), 25.812(e),  
25.855(a), 25.857(e), 25.1447(c)(1), and  
25.1449 of Title 14, Code of Federal  
Regulations

**Regulatory Docket No. FAA-2009-0711**

**PARTIAL GRANT OF EXEMPTION**

By letter dated July 31, 2009, Gregory Jackson, President, Alegre Equine Corporation, Road 186 KM 23.9 El Verde, P.O. Box 1876, Rio Grand, Puerto Rico 00745, petitioned for exemption for relief from §§ 25.785(j), 25.812(e), 25.855(a), 25.857(e), 25.1447(c)(1) and 25.1449 of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would allow the carriage of up to four additional non-crewmembers (commonly referred to as supernumeraries) in and aft of the flight deck on Boeing Model 727-100/200 airplanes, to allow them access into the Class E main-deck cargo compartment during flight for the purpose of attending to live-animal cargo requiring care or inspection.

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

**Section 25.785(j)**, at Amendment 25-88, requires, in pertinent part, handholds to enable passengers to steady themselves when moving about the cabin, in the event the airplane encounters moderately rough air.

**Section 25.812(e)**, at Amendment 25-116, requires, in pertinent part, that floor-proximity emergency escape path markings must provide emergency evacuation guidance for passengers.

**Section 25.855(a)**, at Amendment 25-116, requires that cargo compartments must meet one of the class requirements of § 25.857.

**Section 25.857(e)**, at Amendment 25-93, requires, in pertinent part, that when a Class E cargo compartment is installed on the airplane, the airplane is used for carriage of cargo only.

**Section 25.1447(c)(1)**, at Amendment 25-116, requires, in pertinent part, that oxygen-dispensing units must be automatically presented to the occupants before the cabin altitude exceeds 15,000 feet. The total number of dispensing units and outlets must exceed the number of seats by at least 10 percent. The extra units must be as uniformly distributed throughout the cabin as practicable, and two oxygen masks must be in each lavatory.

**Section 25.1449** requires that the crew is able to determine that oxygen is being delivered to the dispensing unit.

**Related regulations:**

**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.

**Section 25.783(h)**, at Amendment 25-88, requires, in pertinent part, that each passenger-entry door shall meet the requirements of §§ 25.807 through 25.813.

**Section 25.807(g)(1)**, at Amendment 25-94, requires, in pertinent part, that for aircraft with 1 to 9 passengers without overwing exits, at least one Type III emergency exit shall be provided on each side of the fuselage.

**Section 25.810(a)(1)**, at Amendment 25-88, requires, in pertinent part, an approved, self-supporting slide or equivalent means to assist the occupants to the ground.

**Section 25.813(b)**, at Amendment 25-88, requires, in pertinent part, that each passenger-emergency, floor-level exit equipped with an assist means have an assist space next to it.

**The petitioner supports its request with the following information:**

This section quotes the relevant information from the petitioner's request. The complete petition is available at the Department of Transportation's Federal Docket Management System, on the Internet, at <http://www.regulations.gov>, in docket No. FAA-2009-0711.

The 727 freighters presently have no provisions for a sufficient number of supernumerary seats for handlers to help in aid for live animal handling. This request generally follows those granted to other freighter operators and STC holders. The FAA approved Aircraft Flight Manual (AFM) will contain a supplement with the operating limitation restricting the carriage of occupants accommodated to those defined by §121.583 who have been trained for such duties. In addition, an FAA approved training plan will be initiated to instruct the supernumeraries in the prohibition against smoking, and procedures in equipment use relating to fire suppression, ditching, and emergency evacuation. In addition, the Supernumerary Area will meet the following safety requirements:

The supernumeraries will be in an area that can receive verbal information from the flight crew during takeoff, flight and landing when either seated in the cockpit or area between the cockpit and the 9G barrier. If and when the supernumeraries are in the Class E cargo compartment during flight, they will wear headsets that are connected to the aircraft intercom system using headset extension cords that will allow the supernumeraries access to whole length of the cargo compartment. The use of the headsets, will allow the flight crew and the supernumeraries to communicate and to be notified when to don oxygen masks in the event of decompression, and when to return to seat in the event of turbulence or emergency.

### **Federal Register publication**

A summary of this petition was published in the *Federal Register* on October 14, 2009. The FAA received no comments.

### **The FAA's analysis**

By allowing the carriage of the supernumerary persons aboard cargo flights, operators can optimize the utility of the airplanes and the airports. The FAA considers the petitioner's proposal to be in the public interest for the following reasons:

- These supernumeraries are considered a benefit to airplane safety and efficient operations of air cargo.
- A significant disruption of air commerce could occur if the petition is not granted.
- The FAA has granted several exemptions for the carriage of supernumeraries, with in-flight access to the Class E cargo compartment, to attend to cargo on freighter airplanes.

The petitioner has requested relief primarily from the requirements of § 25.857(e), which permits carriage of only cargo when a Class E cargo compartment is installed on the airplane. 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 petitioner is requesting that supernumeraries be located in an area in and aft of the flight deck.

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 has previously granted exemptions for supernumerary in-flight access to Class E cargo compartments, provided that certain other conditions are met. These conditions have

varied, depending on the airplane design, certification basis, and the number of supernumeraries involved. The FAA has been reviewing the operational need for access into the Class E cargo compartment in-flight, and the number of persons needed in the cargo compartment for the type of operation. The FAA has divided access to the main-deck Class E cargo compartment into three types of operations:

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

In the first type of operation, the FAA understands that the industry standard for carriage of horses is one supernumerary for every three to four horses. Considering the size of the 727-100/-200 airplane, many horses could be carried in the Class E cargo compartment. In considering this type of operation, the FAA has considered that live animals present less of a fire hazard than other types of cargo. Therefore, the FAA has allowed less restrictive access for this type of cargo configuration.

With regard to the second type of operation, the FAA has limited access into the cargo compartment to a very small number of supernumeraries (one to three). This number of supernumeraries should be capable of addressing the need to have access to hazardous materials and valuable or perishable goods during flight.

Concerning the third type of operation, carriage of both live animals requiring care or attention during flight, and cargo, the FAA understands 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 that a maximum of four supernumeraries be allowed access to the Class E cargo compartment in-flight to care for and attend to live animals alone. Although the FAA accepts the proposal for access for only a type 1 operation, the FAA chooses to grant all three types of operations, as practical experience has shown that operations need to vary between these operations from flight to flight. The FAA will grant a maximum of four supernumeraries to be allowed access into the main-deck Class E cargo compartment in flight to care for and attend to live animals, and to inspect the cargo, with the following limitation:

The addition of cargo to a live animal 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, the FAA must provide for a reasonable level of protection from smoke inhalation.

The following factors are considered when making a determination of the acceptable level of safety in this case:

- the number of supernumeraries with access to the Class E cargo compartment
- cargo-compartment size
- limited-egress paths

- airplane configuration
- potential cargo present
- duration of exposure to the Class E cargo compartment
- past industry practice

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 system) must be carried by each supernumerary.

The FAA has determined that, due to the way fire in the cargo compartment is to be controlled, supernumeraries on the airplane must be found physically fit by the operator. Supernumeraries also must be briefed on the use of the emergency equipment. These limitations on the supernumeraries are consistent with previously granted exemptions and are included in this partial grant of exemption.

Although not specifically requested by the petitioner, the FAA finds that additional relief should be granted for the emergency exits of the airplane. Because the exact cabin configuration was not identified, the FAA understands that the typical layout uses the flightdeck windows and the left-side, forward door for supernumerary exits. The following relief for exits has been granted previously and the FAA finds it appropriate to grant in this case.

An exit must be available on each side of the airplane for an acceptable level of safety to be provided for supernumeraries, because it is a real possibility that an exit on one side of the airplane may not be useable during an accident due to fire, extensive crash damage, or some obstruction outside of the airplane. The petitioner has proposed that supernumeraries be allowed to occupy an area forward of the Class E cargo compartment and aft of the flight deck. These Boeing Model 727-200 airplanes likely have only one exit aft of the flight deck, which is on the left side of the fuselage in this area. The flight deck has a window exit on each side of the fuselage, but the flightdeck can be separated from the supernumerary seating area by a closed flightdeck door. An acceptable level of safety would be provided, in terms of the exit requirements of part 25, if the flightdeck door is latched open during taxi, takeoff, and landing so that supernumeraries would have access to the flightdeck window exits.

The intent of § 25.783(h) is to ensure that the door used to enter an airplane can also be used as an emergency exit and that the door meets the requirements of § 25.807 through § 25.813. The left-side, door-1 passenger exit meets the criteria, as it is a Type I exit. The emergency exit provided on the right side of the airplane—the flightdeck right window—does not meet the minimum size for a Type III exit as required by § 25.807(g)(1). The FAA has previously granted exemptions for using the flightdeck right window on the Boeing Model 727-200 and other cargo airplanes. Also, the supernumeraries will have a higher level of training and be more physically capable of evacuating the airplane, when using the smaller exit opening provided on the right side of the airplane, than would typical passengers.

In addition to not meeting the requirements of a Type III exit, the flightdeck right window also does not meet the minimum size for a Type IV exit as required by § 25.807(i)(1) for a

ditching exit. As discussed above, the utility of the flightdeck right window, and its usability with the evacuation means provided, have been granted in other exemptions for the Boeing Model 727-200 cargo airplane. Furthermore, the supernumeraries will have a higher level of training and be more physically capable of evacuating the airplane, when using the reduced exit opening on the right side of the airplane, than would typical passengers. It should be noted that, if life rafts must be installed for flights over water, they must be designed so they can be launched out the flightdeck right window.

The petitioner also has not requested relief from the assist-means requirements of § 25.810(a)(1). Because the specific means were not identified, the FAA finds it appropriate to grant the same relief given to others. The issue of whether an escape rope, or inertia reels with harnesses, for trained supernumeraries provides an acceptable alternative to the escape slides required by part 25 for passengers is discussed in some length in Exemption Nos. 4808 and 4808A. (The FAA granted those exemptions to the Boeing Commercial Airplane Group in 1987 and 1997, respectively.) In addition, the issue of whether inertia reels and harnesses provide an acceptable alternative to the escape slide is discussed in detail in Exemption No. 5993A, which the FAA granted in 1995 to the Boeing Commercial Airplane Group for Boeing Model 767-300PF airplanes.

The FAA recognizes that supernumeraries, as opposed to passengers, may be selected and trained appropriately in the use of escape ropes, and inertia reels and harnesses. In this case, the FAA considers that the typical installation of escape ropes (one at the entry door and two for the flightdeck windows) provides an adequate level of safety in this case. The following factors were considered in the FAA's decision to allow escape ropes only:

- Maximum of three crew and four supernumeraries seated in the area in and just aft of the flight deck
- The Boeing Model 727-200 door and window-sill heights
- Inertia reels are not required on other Boeing Model 727-200 cargo airplanes
- The limited number of affected airplanes, and
- The expected service life of the affected airplanes

The FAA would also allow the petitioner to install inertia reels and harnesses. Such installations would require separate FAA design approval.

With respect to the lack of an assist space adjacent to the flightdeck right window as required by § 25.813(b), the FAA has determined that the supernumeraries will have a higher level of training than a typical passenger, and will therefore have less need for crew assistance. Additionally, in the relatively small confines of the flight deck, the flight crew can easily provide instructions and some physical assistance, if needed. The FAA considers that an assist space is not necessary in this case due to the size of this exit relative to the number of occupants, and to the higher level of training and awareness of the occupants.

The petitioner requested an exemption from § 25.812(e), at Amendment 25-116, that requires floor-proximity, emergency-escape-path marking in the passenger areas of the airplane. During the evaluation of this petition, the FAA determined the original certification basis for

the Boeing Model 727-100 and -200 series airplanes did not include Amendment 25-58, which codified the requirements for floor proximity, emergency-escape-path marking. The FAA has determined, therefore, that an exemption to this regulation is not required.

The petitioner has requested an exemption from § 25.855(a). The FAA has previously granted exemptions for carriage of supernumeraries in addition to crew on freighter airplanes, provided that certain other conditions are met. These conditions have varied, depending on the airplane design and the number of supernumeraries involved. To comply with §§ 25.855(h)(2) and 25.857(e)(4), a suitable means must be provided to prevent smoke from penetrating into the occupied areas. The design of the aircraft must account 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 open a door through the smoke barrier between the cargo compartment and the supernumerary compartment. To provide an appropriate level of safety, the petitioner must install a placard indicating that the door through the smoke barrier is to be secured (i.e., the door must be closed) except when entering or exiting the cargo compartment. The placard must be located in a conspicuous place, either on or next to the smoke-barrier door.

The FAA is concerned with the quantity of smoke that may enter the occupied areas in the event of a fire on the main deck. The amount of smoke that would enter into the supernumerary compartment and flight deck, when the smoke barrier is open during evacuation of the cargo compartment by the supernumeraries, must not create a hazard to the occupants. This smoke source must be considered when demonstrating compliance with § 25.855(h)(2).

The purpose of the handholds requirement in § 25.785(j), at Amendment 25-88, is to ensure that occupants have a means to steady themselves in moderately rough air while traversing the main aisles of typical passenger airplanes. The petitioner has proposed that, if and when the supernumeraries are in the Class E cargo compartment during flight, they will wear headsets connected to the aircraft intercom system using headset extension cords, which will allow the supernumeraries access to the whole length of the cargo compartment. The claim is that the use of headsets will allow the flight crew and the supernumeraries to communicate and to be notified when to return to their seats in the event of turbulence or smoke/fire. Although the FAA agrees with the principle of notifying the supernumeraries of actions to be taken during an emergency, the FAA finds the headset and long-cord proposal unacceptable. The FAA has consistently required a visual alert to indicate that persons must return to their seats and secure the smoke barrier (i.e., close the door or curtain) in the event of turbulence or smoke/fire. The FAA finds that the headset-and-cord proposal would not provide an acceptable level of safety when compared to the crew-operated, visual-alert system. The FAA therefore requires the installation of a visual-alerting system. This visual-alerting system enables the crew to indicate, at the onset of turbulence or smoke or fire, that the supernumeraries in the supernumerary compartment and the cargo compartment must return to their seats. The visual alert must be recognized in accessible areas of the airplane, and indicate, during turbulence or smoke/fire, that persons must return to their seats and secure the smoke barrier (i.e., the door or curtain must be closed). Appropriate procedures and limitations must be established to ensure that a flightcrew member alerts the supernumeraries

to return to their seats and secure the smoke-barrier door at the onset of turbulence or smoke/fire. The pre-flight briefing would need to explain these alerts to the supernumeraries.

The FAA considers that the supernumeraries should have an oxygen system that is comparable to that of passengers. However, taking into account the extra knowledge and training that these persons will have, it is not necessary that an equivalent system be installed. Section 25.1447(c)(1) requires automatic presentation of 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, the supernumeraries in the supernumerary seating area and in the Class E cargo compartment would not have this indication. The petitioner has not proposed any method to alert the supernumeraries in the seating compartment of when to don oxygen masks. The petitioner has proposed that if and when the supernumeraries are in the Class E cargo compartment during flight, they will wear headsets connected to the aircraft intercom system using headset extension cords that will allow the supernumeraries access to the whole length of the cargo compartment. The claim is that the use of headsets will allow the flight crew and the supernumeraries to communicate and to be notified when to don oxygen masks and return to their seats in the event of decompression. Although the FAA agrees with the principle of notifying the supernumeraries of actions to be taken during an emergency, the FAA finds the headset and long-cord proposal unacceptable. The FAA has consistently required an automatically activated aural alert to indicate that persons must don oxygen masks and return to their seats and secure the smoke barrier (i.e., close the door or curtain) in the event of decompression. The FAA finds that the headset-and-cord proposal would not provide an acceptable level of safety when compared to the automatically activated, aural-alert system. The FAA therefore requires the installation of an automatic aural-alert system. The FAA finds that the automatically activated, aural, decompression-alert system provides an acceptable level of safety provided that it is present and immediately recognizable throughout the accessible areas in both the supernumerary seating area and the Class E cargo compartment. As a backup to the automated alert system, the flight crew must be able to manually initiate the alert.

The petitioner has proposed mounting portable oxygen bottles within reach of the supernumeraries while in their seats in lieu of automatically presented masks. However, the petitioner did not propose the size of the oxygen system. The FAA requires that the oxygen units be sized for continuous and uninterrupted use during worst-case flight duration following decompression. Additionally, the petitioner proposes to provide supernumeraries with portable walk-around oxygen bottles equipped with supplemental, full-face oxygen masks when accessing the main-deck Class E cargo compartment. This will provide an acceptable level of safety to the immediately available requirement of § 25.1447(c)(1) in the supernumerary seating area and the Class E cargo compartment. To ensure adequate hypoxia protection during non-sedentary use, the portable oxygen device(s) must meet the requirements for flightcrew oxygen equipment (§ 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 their seat following a rapid decompression up to 25,000 feet cabin altitude. One acceptable means of compliance is the use of a continuous-flow, passenger-oxygen mask that meets FAA Technical Standard Order TSO-C64a, or later revision, and is approved for use up to at least 40,000 feet cabin altitude, and is connected to an oxygen bottle that supplies a flow rate

of at least 4 liters per minute Normal Temperature and Pressure Dry (NTPD) at a cabin altitude of 23,000 feet. If the oxygen-bottle regulator has more than one flow rate, it must be set to 4 liters per minute NTPD.

Section 25.1447(c)(1) also requires 10 percent more oxygen masks than the maximum number of seats installed on the airplane. The intent is that these masks will be used by flight attendants or children sitting on passengers' laps. Because no flight attendants, children, or passengers (as differentiated from supernumeraries and flight crew) will be on-board the airplane, installing 10 percent extra oxygen masks is not required.

The petitioner has not requested an exemption from the lavatory-compartment oxygen requirements of § 25.1447(c)(1). The FAA assumes that the oxygen system provided in this area will meet the automatic-presentation requirements. If, however, no automatic presentation is provided, the FAA allows a portable oxygen bottle in the lavatory, provided that it meets the same requirements as the bottles in the supernumerary seating area and an automatic, aural-alert system is installed as described above.

The oxygen units must still meet the intent of § 25.1449, which states that a means must be available for the crew to determine whether oxygen is being delivered to the dispensing units. The FAA allows compliance through training the supernumeraries in making this determination, and to provide oxygen flow indication in or on the oxygen equipment.

Configurations which would not require supernumeraries to access the Class E cargo compartment may be approved for carrying cargo. For these configurations, the alerts are not required to be recognizable in the Class E compartment if an Airplane Flight Manual (AFM) limitation is established to prohibit supernumeraries from accessing the Class E cargo compartment during flight. Placards and procedures must also be changed to be consistent with the AFM limitation.

The FAA provides the following comments regarding the decompression alerts and supplemental-oxygen equipment:

#### **Aural Alert Intensity**

The petitioner must account for operational conditions. 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.

#### **Adequacy of oxygen equipment**

The oxygen units for the supernumeraries must meet the requirements in the FAA's analysis, above, and the limitations in the decision, below.

Note that this exemption does not provide relief, beyond that explicitly stated, from applicable airworthiness requirements. This exemption discusses specific regulations that must be met for approval of the proposed design but does not discuss all the applicable regulations.

## **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, Alegre Equine Corporation is hereby granted an exemption from 14 CFR 25.785(j), 25.807(g)(1), 25.807(i), 25.810(a)(1), 25.813(b), 25.855(a), 25.857(e), and 25.1447(c)(1). The exemption is granted to the extent necessary to allow supplemental type certification of Boeing Model 727-100/-200 series airplanes with provisions for the carriage of supernumeraries. This exemption is subject to the conditions and limitations below.

The FAA recognizes that two categories of operations occur in service:

- I. The airplane does not carry cargo that requires special attention during any operation. Therefore, supernumeraries do not need to access the Class E cargo compartment in flight during any operation. The following limitations apply: 1, 3 (as appropriate), 4, 5.a, 5.b, 6.a, 6.b, 7, 8.a (for lavatory only), 8.b, 9, and 11 (as appropriate) through 13. Limitations 1, 4, and 6, and the pre-flight briefings and placards (as appropriate), must be documented in the Limitations section of the Airplane Flight Manual (AFM). Access to the cargo compartment is prohibited during taxi, takeoff, flight, and landing. A placard to identify this prohibited access is required to be located outside the cargo compartment in a conspicuous location, either on or adjacent to the smoke-barrier door/curtain. This placard must be documented in the Limitations section of the AFM.
- II. The airplane does carry cargo that needs special attention during flight and therefore supernumerary access to the Class E cargo compartment during flight is required. For those operations, limitations 1 through 14 apply. Limitations 1, 2, 4, 5, 9, and the pre-flight briefings and placards (as appropriate), must be documented in the Limitations section of the AFM. Access to the cargo compartment is prohibited during taxi, takeoff, and landing.

This exemption is subject to the following conditions and limitations:

1. Supernumeraries:
  - a. A maximum of four supernumeraries may occupy the area in and aft of the flight deck. The total occupancy of the airplane is limited to seven persons, including the flightcrew (three on-duty flightcrew members, and up to four off-duty flightcrew members, observers, or supernumeraries).
  - b. The supernumeraries are limited to the categories specified in §§ 121.583(a)(1) through 121.583(a)(7).
  - c. Prior to each flight, a flightcrew member must brief each supernumerary on the use of exits, including instructions to inspect the ground to determine whether a safe landing can be achieved, before using an assist means and emergency equipment.

- d. The operator must determine that each supernumerary is physically capable of, and trained to accomplish, the necessary emergency procedures.
  - e. Supernumeraries are prohibited from being in the cargo area behind the smoke barrier during taxi, takeoff, and landing.
2. Main-deck Class E cargo-compartment access limitations:
    - a. Access is limited to the main-deck Class E cargo compartment.
    - 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 or attention during flight, and associated material only, no other cargo. The maximum number of supernumeraries allowed in the cargo compartment in-flight is four.
      - Cargo only, no live animal requiring care or attention during flight. The maximum number of supernumeraries allowed in the cargo compartment in-flight is three.
      - Carriage of live animals, requiring care or attention during flight, and cargo. The maximum number of supernumeraries allowed in the cargo compartment is four.
3. 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 cargo compartment decompression-alerting system, and what supernumerary actions are required
    - the lavatory visual decompression-alerting system and what supernumerary actions are required (if an automatically presented oxygen system is not installed)
    - the visual turbulence-alerting system and the requirement that persons must return to their seats
    - the fire or smoke visual-alerting system, and what supernumerary actions are required
    - access is limited to the care and handling of animals and cargo only
    - access is limited to a maximum of three, unless attending to live animals requiring care or attention in-flight, and with carriage of associated materials
    - access is limited to a maximum of four with carriage of live animals requiring care or attention in-flight
    - 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 by each person entering the cargo compartment

- smoking is not allowed within the cargo compartment
  - the cargo compartment must not be entered in the event of fire or smoke detected inside the Class E cargo compartment
4. The flightdeck door (if installed) must be latched open during taxi, takeoff, and landing when supernumeraries are on board the airplane. The latching means must be able to withstand the loads imposed upon it when the door is subjected to the ultimate inertia forces, relative to the surrounding structure, listed in § 25.561(b). Appropriate procedures/limitations must be established to ensure that taxi, takeoff and landing is prohibited when the flightdeck door is not latched open.
  5. Supernumeraries' supplemental oxygen and protection from smoke inhalation:
    - a. Supplemental oxygen equipment with a mask connected to it must be located so each occupant can don the mask and activate oxygen flow while seated.
    - b. One portable oxygen bottle with one mask connected to it must be available in the lavatory for the supernumeraries if an automatically presented system is not installed.
    - c. At least one portable oxygen unit with a mask connected to it must be provided for each supernumerary allowed to enter the main-deck Class E cargo compartment during flight. These portable units must be located outside the cargo compartment (e.g., in the common area).
    - d. Each supernumerary must carry a portable oxygen unit with a mask connected to it when he or she is in the cargo compartment during flight.
    - e. If Class E cargo-compartment access is approved for four supernumeraries for the mixed-cargo-and-live-animals type of operation, 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 bottle).
  6. Oxygen-system design requirements:
    - a. The oxygen units must provide an indication to the user when oxygen is flowing.
    - b. 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 supernumerary to return to his or her seat where oxygen for the remainder of the decompression is readily accessible.
    - c. The portable oxygen unit must meet the performance requirements of § 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, up to 25,000 feet cabin altitude.
    - d. One acceptable means of compliance is the use of a continuous-flow, passenger oxygen mask that meets FAA technical standard order TSO-C64a or later, and is approved for use up to at least 40,000 feet cabin altitude, connected to an oxygen

bottle that supplies a flow rate of at least 4 liters per minute NTPD at a cabin altitude of 23,000 feet. If the petitioner uses this means of compliance and the bottle has more than one setting for flow rate, the supernumeraries must be trained to use the 4-liters-per-minute NTPD setting.

7. Training:

The supernumeraries must be trained in the use of the oxygen units and protection-from-smoke-inhalation units. The supernumeraries must also be trained in making the determination whether oxygen is being delivered to the dispensing units.

8. Decompression Alert:

- a. An automatically activated, aural, decompression alert must be provided, and immediately recognizable in the lavatory (if an automatically presented system is not installed) and accessible areas of the Class E cargo compartment, to notify supernumeraries when to don the portable oxygen units, return to their seats, and ensure that the smoke barrier is secured (i.e., the door or curtain is closed). As a backup to the automated alert system, the flightcrew must be able to manually activate the alert. The pre-flight briefing must include training in what the alert means and the response to the alert (i.e., procedures for donning the mask and activating the flow of oxygen).
- b. An automatically activated, high-cabin-altitude warning in the flight deck must be provided to notify the supernumeraries in the supernumerary seating area to return to their seats and don oxygen masks. Each supernumerary, while seated, must have a direct view of the flight crew so they are able to observe the flight crew donning their oxygen masks. The pre-flight briefing must include training in the sound of the alert, the meaning of the alert, and the response to the alert (i.e., procedures for donning the mask and activating the flow of oxygen). If a supernumerary does not have a direct view of the flight crew, then an automatically activated aural alert must be installed in the supernumerary compartment similar to 8.a, above.

9. Turbulence, Smoke, and/or Fire Alert:

A flightcrew-member-operated visual alert, which is recognized in the lavatory, the supernumerary seating area, and in accessible areas in the main-deck Class E cargo compartment, must be installed to indicate, during turbulence or predicted turbulence, or fire or smoke in a Class E cargo compartment, that 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 turbulence, or a fire or smoke event, the flightcrew member alerts the supernumeraries to return to their seats and secure the smoke barrier.

10. Supernumerary Emergency Exit:

- a. For the left-side, forward entry door, an escape rope of appropriate length, considering all conditions of landing gear collapse, must be provided for supernumerary use.

- b. If life rafts must be installed for flights over water, they must be designed so they can be launched out the flightdeck right window.

#### 11. Placards:

Placard(s) are to be located outside the cargo compartment in a conspicuous location, either on or adjacent to the smoke-barrier door or curtain. The placards must indicate the following:

- Occupancy of the Class E cargo compartment is prohibited during taxi, take-off, and landing.
- Access is limited to the care and handling of animals, and hazardous or perishable cargo only.
- Access is limited to a maximum of three persons unless transporting live animals and associated material. Access is limited to four persons when transporting live animals.
- 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 mask attached) must be carried at all times when in the cargo compartment.
- A portable smoke-inhalation-prevention device must be carried at all times, for mixed-cargo operation, for configurations with four supernumeraries.
- Smoking is not allowed within the cargo compartment.
- The compartment must not be entered in case of fire or smoke being detected inside any Class E cargo compartment.

The pre-flight briefing must inform supernumeraries of these requirements.

#### 12. Alerting Requirements:

- Must be distinctive and effective. Alerts must distinguish between decompression and turbulence/smoke/fire.
- Visual alerts must be visible from all occupant locations and orientations, and 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.

#### 13. Public Address System:

A standard, airplane public-address (PA) system must be installed. It must be audible throughout the supernumerary seating area, the galley, and the lavatory.

14. Flight Tests:

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: Based on the results of these tests, the occupancy of the main-deck Class E cargo compartment may be limited to less than the maximum allowed in condition 2.

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/s/

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