

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

In the matter of the petition of

**Aeronautical Engineers, Inc.**

for an exemption from §§ 25.785(j),  
25.810(a)(1), 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-2015-6277**

**PARTIAL GRANT OF EXEMPTION**

By letter dated August 28, 2015, Mr. David M. McDonald, Vice President, Aeronautical Engineers Inc., 7765 NW 54<sup>th</sup> Street, Miami, Florida, 33166, petitioned the Federal Aviation Administration (FAA) for an exemption from the requirements of §§ 25.785(j), 25.810(a)(1), 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). This exemption, if granted, would permit the carriage of up to seven non-crewmembers (commonly referred to as supernumeraries) aft of the flight deck on Boeing Model 737-800 airplanes which have been converted from a passenger to freighter configuration. It would allow up to seven supernumeraries access into the Class E main cargo compartment during flight for the purpose of attending to cargo types requiring care or inspection, or both (e.g., live animals or hazardous materials).

**The petitioner requests relief from the following regulation(s):**

**Section 25.785(j), at Amendment 25-88**, requires, in pertinent part, a firm handhold to enable occupants to steady themselves when moving through the aisles in moderately rough air.

**Section 25.810(a)(1), at Amendment 25-114**, requires a self-supporting emergency exit slide for passengers.

**Section 25.812(e), at Amendment 25-116**, requires floor proximity emergency escape path lighting.

**Section 25.855(a), at Amendment 25.116**, requires that cargo compartments 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 to carry cargo only.

**Section 25.1447(c)(1), at Amendment 25-116**, requires 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 uniformly distributed throughout the cabin as practicable. There must be at least two oxygen dispensing units connected to oxygen terminals in each lavatory.

**Section 25.1449** requires a means to allow the crew to determine whether oxygen is being delivered to the oxygen dispensing equipment.

### **Related sections of 14 CFR**

**Section 121.583(a)** contains, in part, a list 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:**

This section quotes the relevant information from the petitioner's request, with minor edits for clarity. The complete petition is available at the Department of Transportation's Federal Docket Management System, on the Internet at <http://regulations.gov>, in Docket No. FAA-2015-6277.

### **General**

Aeronautical Engineers, Inc. (AEI) holds numerous supplemental type certificates (STCs) for modification of transport aircraft. With regard to this petition, AEI is applying for STCs which allow conversion of Boeing 737-800 aircraft to a freighter with a Class E main deck cargo compartment. Over 300 Boeing aircraft have been converted by AEI to freighters. Some operators of AEI freighters need to be able to carry supernumeraries to assist with special cargo such as valuable cargo requiring security and/or perishable, fragile, or live cargo requiring special attention to ensure its safe delivery. The interest of the petitioner is in providing a level of safety for the crew, supernumeraries, cargo, and aircraft that will allow operators of AEI-converted 737 freighters to meet the needs of their clientele.

In this case, the supernumeraries are limited to a maximum of seven persons (plus two crew members for a total of nine souls on board). The supernumeraries will occupy existing flight attendant and observer seats within or immediately aft of the flight deck as well as additional seating being added forward of the 9G smoke barrier that separates the supernumerary area from the Class E cargo compartment.

## **Exemptions Being Petitioned**

The exemption from § 25.785(j) is necessary to allow the supernumeraries to move through the Class E compartment to care for cargo/animals and firm handholds are not available in the cargo compartment.

The exemption from § 25.810(a)(1), Amendment 25-114, requires there be a self-supporting emergency exit slide for passengers. Section 25.810(a)(2) provides that flight crew may utilize an escape rope for emergency egress. Similar to AEI's STC number ST01827LA, AEI will install an emergency escape rope in the supernumerary area.

The exemption from § 25.812(e) will allow trained supernumeraries to occupy the Class E compartment. Since the supernumeraries will be trained on emergency procedures, including emergency egress from the cargo area, the lack of additional lighting will not adversely affect safety.

Exemption from § 25.855(a) is also requested as this regulation requires any cargo compartment to comply with a designated classification of § 25.857 which would exclude the carriage of supernumeraries in the cargo compartment. AEI freighters have a Class E main deck cargo compartment.

The exemption from § 25.857(e) will allow for the accommodation of up to seven supernumeraries in addition to the crew. The FAA-approved aircraft flight manual (AFM) will contain a supplement with the operating limitation restricting the carriage of occupants to those personnel described in § 121.583(a).

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 portable oxygen units meet the requirements of § 25.1447(c)(1), excluding the requirement that the number of oxygen units must exceed the number of seats by at least 10 percent. Since the supernumeraries will be trained in emergency procedures and will be carrying the portable oxygen with them when not in their seats, an equivalent level of safety is maintained without having an additional 10 percent supply cushion.

To the extent the § 25.1449 requires the crew to be able to determine if oxygen is being provided to the portable oxygen bottles being utilized by the supernumeraries, AEI also seeks exemption from compliance from this regulation as it is technically and commercially infeasible to comply with the requirements of § 25.1449 when the supernumeraries are using portable oxygen.

## **Justification for Request**

As set for the above, § 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 airplane operations that would require supernumeraries to enter the Class E cargo compartment are divided into three types:

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; and
3. Carriage of live animals requiring care/attention during flight and cargo.

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

### **Request for Waiver of Public Comment**

AEI requests waiver of the normal public comment process since this request is substantially similar to that already granted Custom Air Transport and because other similar petitions have already been granted to other freighter operators and STC holders to accomplish the same objectives with very similar conditions.

### **Public Interest**

The carriage of an appropriate number of attendants aboard an aircraft to monitor and to attend to the special requirement of valuable, fragile, perishable, or live animal cargo, serves the public interest in raising the level of safety of the cargo, the airplane, the flight crew, and consequently, the public in general. In addition, these exemptions will enhance the utility of the aircraft, thereby helping to reduce shipping costs, which will in turn be in the public interest.

This exemption therefore serves the public interest for safety reasons and also for increased airfreight utility, both domestically and internationally, and consistent commercial operations among all AEI freighter operators.

### **Safety**

Safety is the primary concern. All safety requirements of the original type certification of the aircraft will be complied with as defined by the aircraft type certificate data sheets (TCDS) A3WE. Any adverse effects that the exemption and the equivalent level of safety of the modification will cause are discussed below.

## Adverse Effects

The exemption is to allow for the carriage of supernumeraries. Because of the level of safety provided by 14 CFR part 25, and the restrictions placed on the carriage of personnel as specified in the FAA-approved AFM supplement, there are no apparent adverse effects.

## Equivalent Level of Safety

The modification will be designed to incorporate certain features that will ensure the supernumeraries enjoy a level of safety equivalent to that enjoyed by passengers, as provided by the original certification basis of the aircraft, and some of the updated part 25 regulations.

1. **Emergency Equipment** -- In providing for a compensating level of safety for the main deck occupants, a fire extinguisher, crewmember protective breathing equipment (CPBE), first aid kit, emergency locator transmitter (ELT), and any other required equipment would be provided. For emergency egress assistance, an axe will be provided to assist in the case of a jammed or stuck exit door.
2. **Decompression Signal** -- An automatically activated decompression signal immediately recognizable throughout the cabin area will be provided to automatically notify supernumeraries when to don oxygen.
3. **Emergency Lighting System, 14 CFR 25.812** -- An emergency lighting system will be provided to meet Amendment 25-15, including the following items:
  - Emergency lighting illumination of the seating area, passageways, door signs, instructions, etc. will be provided.
  - Exit identifier signs.
  - Exterior lighting at the base of the slide.

Due to the proximity of the seats to the intended exits and that the occupants have a direct view of those exit doors, it is believed that escape path lighting (EPL) installation will not add to the safety level and therefore, will not be installed and an exemption from § 25.812(e) is requested.

4. **Lighted Fasten Seat Belt Signs, 14 CFR 25.791** -- Flight crew-activated lighted “Fasten Seat Belt” signs will be provided that are visible while seated.
5. **Lighted Return to Seat Signs** -- Flight crew-activated “Return to Seat” signs will be provided along the length of the aircraft.
6. **Flight Deck Communications, 14 CFR 25.1423** -- A standard aircraft intercom/public address (PA) system will be installed and the PA system will be

audible from anywhere within the aircraft. The PA system will be activated from either the flight deck or from the supernumerary seating area.

7. **Flight Phone** -- Two-way communication from the supernumerary seating area to the flight deck will be provided by means of a flight phone installed within reach of at least one of the supernumeraries at their seats.
8. **Placards** -- The following placards will be provided:
  - No smoking signs
  - Door operating instructions
  - Slide operating instructions
  - Raft operating instructions
  - External door exit marking
9. **AFM Supplement** -- The FAA-approved AFM will be supplemented to contain operating limitations restricting the carriage of occupants to those identified in § 121.583.
  - The AFM supplement will limit the seats to being occupied by supernumeraries only.
10. Due to the fact that AEI-converted aircraft are operated internationally, AEI requests the exemption, if granted, be applicable both within and outside the United States of America.

### **Federal Register publication**

The FAA has determined that good cause exists for waiving the requirement for *Federal Register* publication for public comment because the request is identical in all material respects to previously granted exemptions; the exemption, if granted, would not set a precedent; and any delay in acting on this petition would be detrimental to AEI.

### **The FAA's Analysis**

By allowing the carriage of supernumeraries aboard cargo flights, operators will be able to 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 seen as a benefit to airplane safety and efficient operations of cargo.

- A significant disruption of air commerce could occur if the petition were not granted.
- The FAA has granted many exemptions for the carriage of supernumeraries on freighter airplanes.

The petitioner has requested relief primarily from the requirements of § 25.857(e), which permits only the carriage of 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 shutting off ventilating airflow and may be enhanced 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 aft of the flight deck.

The certification regulations for transport category airplanes address airplane occupants as 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. Since supernumeraries are not crewmembers, they must be considered “passengers” by default with respect to part 25. However, the supernumeraries do hold a special status because of their training and other factors.

The requirement for handholds 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. On the proposed airplane, we find that an acceptable level of safety will be provided by the crew-operated visual alert system (return to seat lighted signs). This visual alert system enables the crew to indicate, at the onset of turbulence, that supernumeraries in the cargo compartment or not in their seats must return to their seats. The visual alert must be recognized in the accessible areas of the supernumerary area and in the Class E cargo compartment and indicate, during turbulence, that persons must return to their seats and secure the smoke barrier (i.e., the door or curtain must be closed). The pre-flight briefing would need to explain this alert to the supernumeraries.

The petitioner has requested relief from the requirements of § 25.810(a)(1), which requires the passenger emergency exits to be equipped with a self-supporting slide or equivalent assist means. The petitioner has proposed to install an escape rope in the supernumerary area just aft of the flight deck. This rope must be acceptable for use with the L1 and R1 exit doors.

The issue of whether escape ropes for trained supernumeraries provide 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.) This issue is also discussed in Exemption No. 5993A, which the FAA granted in 1995 to the Boeing Commercial Airplane Group for Boeing 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. The FAA considers that the typical installation of escape ropes (one at the entry door and two for the flight deck windows) provides an adequate level of safety in this case. The FAA considered the following factors in its decision to allow escape ropes only.

- Maximum of two crew and seven supernumeraries seated in the area in and just aft of the flight deck.
- The Boeing Model 737 airplane door and window-sill heights.
- Inertia reels not required on other Boeing Model 737 cargo airplanes.
- The expected service life of the affected airplanes.

The FAA would allow the petitioner to install inertia reels and harnesses with separate FAA design approval.

The intent of § 25.812(e) is to provide floor-proximity, emergency-escape-path marking in the passenger areas of the airplane. Because of the limited area aft of the flight deck and its immediate proximity to the forward emergency exits, the lack of the floor-proximity, emergency-escape-path marking will not adversely impact the safety of the supernumeraries. Additionally, the supernumeraries have a higher level of training and knowledge of the airplane configuration than the typical passenger. The FAA finds that the configuration provides an acceptable level of safety.

To comply with §§ 25.855(h)(2) and 25.857(e)(4), there must be suitable means of preventing smoke penetration into areas that are occupied. The petitioner's design must provide a barrier which must comply with the smoke penetration requirements for the flight deck and the supernumerary compartment. However, the petitioner indicated that configurations may be approved that will allow supernumeraries to enter the Class E cargo compartment. To gain access, the supernumeraries would open 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 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 a conspicuous place, either on or next to the smoke barrier.

The FAA has a concern associated 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 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. The smoke source must be considered when demonstrating compliance with § 25.855(h)(2).

On previous certification programs, if access into the Class E cargo compartment was going to be allowed, we required that an alert (aural, visual, or both) be installed, operated by a flightcrew member, and recognized in the Class E cargo compartment. The alert immediately notified the supernumeraries that there was smoke or fire in the compartment. The alert indicated that persons must return to their seats and secure the smoke barrier (i.e., close the door or curtain) if there was a fire. The pre-flight briefing included an explanation of this alert to the supernumeraries. On this certification program, the petitioner has proposed installing lighted “return to seat” signs along the length of the airplane (in the supernumerary area and in the Class E cargo compartment) requiring manual activation of the alert by the flightcrew. We find that the proposal provides an acceptable level of safety, provided that the signs are viewable from all accessible areas of the supernumerary area and Class E cargo compartment.

Due to the way that fire in the cargo compartment is to be controlled, it is necessary to limit persons on the airplane to supernumeraries 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 indicated that configurations may be approved that will allow the supernumeraries to enter the Class E cargo compartment in-flight to attend to animals or hazardous cargo. The FAA considers that the supernumeraries should have an oxygen system that is comparable to that of passengers to protect against hypoxia in the event of a decompression. 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 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. Supernumeraries on the subject airplane will not have this indication. For an acceptable level of safety, an automatically activated aural decompression signal must be immediately recognizable throughout the supernumerary seating area and the Class E cargo compartment. Operation of this signal must be automatic, with flightcrew manual operation as a backup. Supernumeraries must be trained regarding the location and use of the oxygen equipment, and the alerts that indicate the need to don oxygen equipment. The combination of the aural alert, along with the supernumerary training to carry the portable oxygen units, compensate for the oxygen masks not being automatically presented. A portable oxygen system must be carried by each supernumerary upon entering the cargo compartment to protect against decompression.

The use of portable oxygen equipment following annunciation of a smoke event should be at the discretion of the supernumeraries, depending on where the source of the smoke is in relation to each supernumerary and the exit. Therefore, in the event of smoke being detected inside the Class E cargo compartment, the supernumeraries inside the Class E cargo compartment must be directed to immediately return to their seats and secure the smoke barrier. As necessary, the supernumeraries should don their oxygen mask and initiate the flow of oxygen.

The portable oxygen units must still meet the intent of § 25.1449, which states that there must be a means for the crew to determine whether oxygen is being delivered to the dispensing units.

We find that it would be an acceptable means of compliance to train the supernumeraries in making this determination and to provide oxygen flow indication in the oxygen equipment.

Section 25.1447(c)(1) also requires 10% extra oxygen masks. The intent is that these masks will be used by flight attendants and children sitting on passengers' laps. Since neither will be on-board the airplane, installing 10% extra oxygen masks is not required.

Supernumeraries must be trained in the location and use of the oxygen equipment, and the signals for its use. The oxygen units must be sized adequately for continuous and uninterrupted use during worst-case flight duration following decompression, or of sufficient duration to allow the supernumeraries to return to their seats. The portable oxygen equipment must meet the requirements in § 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 to 25,000 feet cabin altitude. Additionally, the portable oxygen equipment must:

- Meet § 25.1439(b)(1), (2), and (4); and
- be designed to prevent any inward leakage to the inside of the mask; and
- prevent any outward leakage causing significant increase in the oxygen content of the local atmosphere.

Configurations may be approved for carrying cargo which would not require supernumeraries to access the Class E cargo compartment. For these configurations, an aural and visual decompression alert is not required to be recognizable in the Class E cargo compartment if an airplane flight manual (AFM) operating limitation is established to prohibit supernumeraries from being in the Class E cargo compartment during flight. Placards and procedures must also be changed to be consistent with the AFM operating limitation.

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

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

All large animals shipped by air need supernumeraries on board for their care and 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 safety of flight. Horses are routinely shipped by air and are one of the large animals that require care and attention during flight because of the brute-force issue. Also, these horses that are shipped by air are high-value animals and the owners and insurance policies require in-flight care and attention. We understand that there is an industry standard for the air transport of horses that recommends 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 (live animals only), we understand that there could be a large number of horses in the main deck cargo compartment needing one supernumerary for every three or four horses. As a result of the large number of horses (or other large animals) that could be carried, an appropriate number of supernumeraries (grooms/handlers) would be required. We have granted exemptions in the past for a larger number of supernumeraries with access into the main deck cargo compartment under certain conditions. These conditions have included limiting the permitted cargo to 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 seven supernumeraries to be allowed to access the main deck Class E cargo compartment in flight for the care and attention of live animals. We accept the proposal.

With regard to the second type of operation (cargo only), the petitioner has proposed allowing access to seven supernumeraries. In previously granted exemptions, unless there is a special need or circumstance, we have limited the access into the cargo compartment to up to three supernumeraries only. This number of supernumeraries should be capable of addressing the access needs for the hazardous materials and valuable or perishable goods during flight. The petitioner has not proposed a special need or circumstance that would require seven supernumeraries access to the Class E cargo compartment in-flight. Therefore, the maximum number of supernumeraries allowed into the Class E cargo compartment to care for, or attend to, hazardous, valuable, or perishable cargo is three.

Concerning the third type of operation (combination of live animals needing 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 that a maximum of seven supernumeraries be allowed access to the Class E cargo compartment in flight for the care/attention of live animals and for inspection of cargo. 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, we must provide for a reasonable level of protection from smoke inhalation. Several factors are considered when making a determination for 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. We accept

the proposal for allowing a maximum of seven supernumeraries into the main deck Class E cargo compartment during flight for the care and attention of live animals and to inspect the cargo.

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, I grant Aeronautical Engineers, Inc. (AEI), an exemption from 14 CFR 25.785(j), 25.810(a)(1), 25.812(e), 25.855(a), 25.857(e), 25.1447(c)(1), and 25.1449. The exemption is granted to the extent necessary to allow AEI to convert Boeing 737-800 airplanes to freighters with a Class E main deck cargo compartment with provisions for the carriage of supernumeraries.

This exemption is subject to the following conditions and limitations:

1. The following operating limitations must be documented in the limitations section of the AFM:
  - a. A maximum of seven supernumeraries, limited to the categories specified in § 121.583(a)(1) through (7), may occupy the area just aft of the flight deck. The total maximum occupancy of the airplane is limited to nine persons, including the flightcrew (two on-duty flight crewmembers and two observers on the flight deck).
  - b. The operator must determine that each supernumerary:
    - i. Is physically able and trained to accomplish the necessary emergency procedures.
    - ii. Has been trained in the use of the oxygen units, including making the determination whether oxygen is being delivered to the dispensing units.
  - c. Prior to each flight, a flight crewmember must brief each supernumerary on the following:
    - i. The use of exit ropes, exit slides, or inertia reels, including instructions to inspect the ground to determine whether a safe landing can be achieved before using an assist means and emergency equipment.
    - ii. The meaning of all alerts required by this exemption.

- iii. That access to the cargo area below the smoke barrier is prohibited during taxi, take-off, and landing.

2. Supernumerary Oxygen:

- a. There must be at least one portable oxygen unit, with an oxygen mask connected 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 when oxygen is flowing.
  - b. The portable oxygen unit must meet the performance requirements of either § 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. In addition, the portable oxygen equipment must:
    - i. Meet § 25.1439(b)(1), (2), and (4); and
    - ii. be designed to prevent any inward leakage to the inside of the mask; and
    - iii. prevent any outward leakage causing significant increase in the oxygen content of the local atmosphere.
  - c. The portable oxygen units must be located outside the cargo compartment (e.g., in the common area) except when in use.
  - d. The portable 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 additional oxygen is readily accessible for the remainder of the decompression event.
  - e. Based on the petitioner's proposal, the lavatory and the area with the supernumerary seats must still meet § 25.1447(c)(1), except for the requirement for 10% extra oxygen dispensing units.
3. 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.
4. For the exits designated for supernumerary use, exit ropes or nine descent devices (commonly known as inertia reels) and nine harnesses for use with the descent devices must be provided. This condition does not apply to airplanes that retain the passenger evacuation slides.

5. Alerting Requirements:

- a. Visual alerts must be visible and recognized in the accessible areas of the Class E cargo compartment at all occupant locations and orientations, during all expected operational conditions, including a rapid decompression where moisture in the air may condense.
- b. The pre-flight briefing must explain the alerts to the supernumeraries. The briefing, alerts, and associated procedures and limitations to signal the supernumeraries are not required if an AFM limitation is established to prohibit supernumeraries in the Class E cargo compartment.

c. Decompression Alert:

An automatically activated aural decompression alerting system must be present and immediately recognizable in accessible areas of the supernumerary area and the Class E cargo compartment to notify supernumeraries when to don oxygen masks.

d. Turbulence Alert:

A flightcrew-operated visual alerting system, recognizable in accessible areas of the supernumerary area and in the Class E cargo compartment, must be installed to indicate that persons must return to their seats during turbulence. 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.

e. Smoke/Fire Alert:

A flightcrew-activated alerting system, recognizable in the Class E cargo compartment, must be installed. This aural or visual alerting system is to indicate that persons must return to their seats and ensure that the smoke barrier is secured (i.e., the door or curtain is closed) in the event of fire or smoke in the Class E cargo compartment. Appropriate procedures and limitations must 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 or smoke event.

6. Placards are to be located outside of the cargo compartment, in a conspicuous location either on or adjacent to the smoke barrier. Placards must indicate the following:

- a. Occupancy of the Class E cargo compartment is prohibited during taxi, take-off, and landing.

- b. Access is limited to the care and handling of animals and hazardous/perishable cargo only.
- c. Access is limited to a maximum of three persons during flight with cargo only. Access is limited to a maximum of seven persons during flight with animals only or a combination of animals and cargo.
- d. The smoke barrier must be secured (i.e., the door or curtain must be closed) except when entering or leaving the cargo compartment.
- e. Smoking is not allowed in the cargo compartment.
- f. The Class E cargo compartment must not be entered when smoke/fire is detected inside the compartment.
- g. A portable oxygen unit must be carried at all times when in the Class E cargo compartment.

7. Main Deck Class E Cargo Compartment Access Limitations:

- a. Access into the main deck Class E cargo compartment in flight is limited to the following three types of operation:
  - i. Carriage of live animals requiring care and attention during flight, and associated material only. No other cargo.
  - ii. Cargo only. No live animals requiring care and attention during flight.
  - iii. Carriage of live animals requiring care and attention during flight; and other cargo.

- b. The maximum number of supernumeraries allowed in the main deck Class E cargo compartment is three for 7(a)(ii) and seven for 7(a)(i) and (iii).

Issued in Renton, Washington, on March 10, 2016.

/s/

Michael Kaszycki  
Acting Manager, Transport Airplane Directorate  
Aircraft Certification Service