

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

In the matter of the petition of

Israel Aircraft Industries, Ltd.

for an exemption from §§ 25.785(j),
25.813(b)(3), 25.857(e) and 25.1447(c)(1) of
Title 14, Code of Federal Regulations

Regulatory Docket No. FAA-2008-0158

GRANT OF EXEMPTION

By letter dated February 3, 2008, Mr. A. Rogev, Director of Certification, Aircraft Division, Bedek Group, Israel Aircraft Industries, Ltd., LOD 70100, Israel, petitioned for an exemption from §§ 25.785(j), 25.813(b)(3), 25.857(e), and 25.1447(c)(1) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would allow the carriage of up to two additional non-crewmembers (commonly referred to as supernumeraries) aft of the flight deck on Boeing Model 737-400 airplanes converted from a passenger to a freighter configuration, and allow them access into the Class E main deck cargo compartment during flight for the purpose of attending to cargo types requiring care or inspection, or both (e.g., live animals and/or hazardous materials).

The petitioner requests relief from the following regulations:

Section 25.785(j), at Amendment 25-88, 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 25.813(b)(3), at Amendment 25-116, requires that for each Type C, I or II exit installed in an airplane with seating for more than 80 passengers, an assist space must be provided at one side of the passageway regardless of whether an assist means is required by § 25.810(a).

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, 10 % extra oxygen masks, and that there be two oxygen masks in each lavatory.

Related sections of 14CFR:

Sections 25.813(b) and 25.813(b)(1), at Amendment 25-116, require, in pertinent part, that adequate space to allow crewmember(s) to assist in the evacuation of passengers be provided. Each assist space must be a rectangle on the floor, of sufficient size to enable a crewmember, standing erect, to effectively assist evacuees. The assist space must not reduce the unobstructed width of the passageway below that required for the exit.

Section 25.813(b)(4), at Amendment 25-116, requires that for each Type C, I or II exit, an assist space must be provided at one side of the passageway if an assist means is required by § 25.810(a).

Section 25.813(b)(6), at Amendment 25-116, requires that there be a handle, or handles, at each assist space, located to enable the crewmember to steady himself or herself:

- (i) While manually activating the assist means (where applicable) and,
- (ii) While assisting passengers during an evacuation.

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's supports its request with the following information. This information is quoted from the petition.

Introduction

IAI has requested to certify (STC) a major modification of a B737-400 aircraft from passenger to a special freighter (SF) configuration. The program is being certified by the CAAI, then by the FAA via a validation process. The project has been assigned the FAA project number ST-10131SE-T.

IAI is requesting to be granted an exemption from meeting certain requirements, pertaining to the following:

- Carriage of two non-crewmembers (supernumeraries), in a dedicated supernumerary compartment in addition to the existing flight deck occupancy of two flight crewmembers, and two observers.

- Access of supernumeraries into the Class E compartment in flight for the purpose of attending to the cargo.
- Use of non presenting oxygen masks in the supernumerary compartment and use of portable oxygen bottle by persons entering the Class E cargo compartment in lieu of self presenting oxygen masks.
- Relief from the requirement for hand holds for persons entering Class E cargo compartment.
- Relief from requirement for assist space at floor level exit.

The exemption is requested for B737-400 aircraft modified to special freighter under an IAI STC. The configuration of the modified airplane as related to the carriage of supernumeraries and the requested exemptions are identical to the configuration of the IAI 737-300 special freighter and exemptions which were previously granted to IAI by the FAA for that conversion (Ref Exemptions 8335 and 8335B).

In view of the commonality of the projects and the identical exemptions requested, IAI requests that the requirement for publication of a summary for public comment be waived in order to shorten the time for processing the petition.

a. [CF]R 25 Affected Sections

Section 25.785(j), at Amendment 25-88 Seats, berths, safety belts, and harnesses, requires in pertinent part, that that there be a firm handhold, handgrip, or rail along each aisle to enable persons to steady themselves while using the aisles in moderately rough air.

Section 25.813(b)(3), at Amendment 25-116 Emergency Exit Access, requires, in pertinent part, that each passenger emergency floor level exit equipped with an assist means have an assist space next to it.

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

Section 25.1447(c)(1), at Amendment 25-116 Equipment Standards for Oxygen Dispensing Units, 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 uniformly distributed throughout the cabin as practicable, and there must be two oxygen masks in each lavatory.

b. Related Sections of the [CF]R

Section 121.583(a) Carriage of persons without compliance with the passenger-carrying requirements of this part contains, in pertinent part, a listing of categories of the people who may be carried aboard an airplane in part 121 services without complying with the requirements of part 121 to carriage of passengers.

Description of the converted airplane configuration

General

The Boeing B737-400 is a transport category airplane. The converted B737-400SF will have an all-cargo main deck configuration. A new 9g rigid cargo/smoke barrier located aft of doors 1L and 1R, separates the Class E main deck cargo compartment from the supernumerary compartment The existing flight deck accommodation for pilot, co-pilot and two observer seats are retained from the type certified aircraft providing for a flight deck maximum occupancy of four persons. Two (2) additional non-crewmembers (supernumeraries) are seated in the supernumerary compartment on the original existing aft facing flight attendant seats, which are mounted on the aft lavatory wall near door 1L.

Supernumerary seats

The type certified aft facing cabin attendant seats and their restraint harness are retained unchanged from the type certified aircraft. Life vest and their stowage provisions are also retained unchanged for the use of the supernumeraries.

Emergency exits arrangement and emergency evacuation

The existing original aircraft emergency egress means doors 1L and 1R are not affected by the modification to freighter and are retained with their slides, marking, accessibility and illumination. These doors provide the emergency exits for the supernumeraries in compliance with the regulations, except for the lack of assist space aft of door 1L due to the installation of the rigid barrier closely aft of the door.

Flight deck exits and evacuation path are not affected by the conversion to freighter. Following an emergency landing an evacuation alert signal will be given to the supernumeraries through an existing attendant evacuation signaling system.

PA [Public Address] system and Intercom

The existing PA system is retained in the supernumerary area. The existing FWD attendant station intercom is retained.

Oxygen equipment

The conversion to freighter requires a capability to depressurize the airplane in order to extinguish fire in the class E compartment and to maintain a cruise altitude of 25K ft until landing is possible.

In order to provide oxygen for the airplane occupants for the required duration the following equipment is provided:

For the two supernumeraries within the supernumerary area, two oxygen bottles with two masks that are permanently connected to the bottles are installed within reach of the seated supernumeraries. The oxygen bottles are sized for the maximum required flight duration. An illuminated "Use Oxygen" sign is installed in direct view of the seated supernumeraries. Illumination of the sign, combined with an audible warning signal over the PA, will be operated automatically if cabin altitude exceeds 15K ft in case of loss of cabin pressure or manually by the flight crew, to alert the supernumeraries.

Due to the close proximity of the galley area to the supernumerary seat there is no need for an additional oxygen source at the galley. A lighted "Return to seat" sign shall be installed at the galley area, activated automatically and manually simultaneously with the "Use Oxygen" signal.

Lavatory compartment self presenting oxygen mask dispenser is retained in the type certified configuration.

Oxygen supply to any person entering Class E cargo compartment is provided by an 11ft³ portable oxygen bottle with full face mask which must be carried by the person entering the compartment at all times. Persons in the cargo compartment will be warned to use oxygen and return to seat through a cargo compartment alert system.

Excess of oxygen masks is also provided by the installation of the portable oxygen bottle in the supernumerary compartment.

Smoking is not permitted in the compartment. Appropriate instruction placards are installed on the cargo compartment and lavatory entry doors.

Flight deck oxygen system as certified in the original aircraft for the four flight deck occupants is sufficient for the required flight duration and is not affected by the conversion to freighter.

Cargo compartment alert system

A flight deck operated switch shall activate a visual alert system flashing alternate compartment lights for the duration of 20 seconds to indicate to any person within the compartment that immediate return to seat is required. The system shall be activated by the flight crew to warn persons in the cargo compartment of a need to return to seat due to a smoke alert or an imminent turbulence.

An aural and visual alert system consisting of horns and flashing of alternate compartment lights will be automatically activated in case of loss of cabin pressure at cabin altitude above 15K ft and in case of activation of the decompression mode

or manually by the flight crew, to alert any person in the class E compartment to don oxygen mask and return to seat.

Appropriate instruction placards are installed at the cargo compartment entry door.

Lavatory Compartment

The type certified aft lavatory compartment is retained unchanged from the type certified aircraft including its self dropping oxygen mask.

Crew Galley

G1 galley unit is retained from the type certified aircraft.

An illuminated "Return to seat" sign is installed on the face of the galley. The galley is located in close proximity to the oxygen bottle and the supernumerary seats. A fire extinguisher and a PBE are installed on the rigid barrier adjacent to the galley.

Cargo Compartment Access Door

An entry slide door in the 9g barrier provides access to the main deck Class E cargo compartment from the supernumerary compartment. The door and barrier shall be designed to prevent smoke penetration into occupied area. The door must be closed at all times except for entry and exit. Entry into the compartment is prohibited during taxi, takeoff and landing or in case of fire within the compartment. A placard on the door provides the operating instructions and limitations accordingly.

Airplane Flight Manual

Flight manual supplement shall include all the limitations and instructions related to the carriage of supernumeraries and their entry into the class E compartment in flight including instructions for their pre flight briefing by the crew.

Requested exemption

Exemption from the aforesaid sections is sought to the following extent:

Section 25.785(j): An exemption is requested from the requirement for a firm hand hold, hand grip or hand rail for persons entering the cargo compartment in flight. As the compartment is a large open space it is impractical to provide hand hold for a person entering the compartment. Instead, an equivalent safety is provided by the alert system that is available for the flight deck crew to warn persons in the cargo compartment of imminent turbulence and of the need to return to their seats and by their physical capability and training.

Section 25.813(b): An exemption is requested from requirement for assist space adjacent to exit door. Assist space is not needed since supernumerary persons are capable of performing autonomous evacuation of the aircraft and there is no cabin crew on board to provide assistance.

Section 25.857(e): Relief is sought to permit carriage of four (4) non-crew persons (Two observers and two supernumeraries), in addition to the two flight crewmembers, on an all-freighter airplane, which has a class E cargo compartment.

Section 25.1447(c)(1): An exemption is requested to allow usage of non self presenting oxygen dispensing units in the supernumerary compartment. Self presenting masks alert passengers of the need to don masks which are located within hand reach. An equivalent safety is provided by having oxygen bottles with connected masks installed in direct view and within hand reach of the seated supernumerary and by an automatic and manual alert system illuminating an ordinance sign located in direct view of the supernumeraries. The visual signal, combined with an audio signal, alert persons in the supernumerary compartment of the need to don the masks and use oxygen. Non-crewmembers shall be briefed pre-flight on the use of oxygen equipment.

An exemption is requested to allow usage of non self presenting oxygen dispensing units in the class E compartment. An equivalent safety is provided by having a portable oxygen bottle with a full face mask which must be carried by each person entering the Class E cargo compartment at all times and by providing an automatic and manual audio and visual alert system alerting the person to don the oxygen mask.

Supporting arguments

Exemption from cargo only provisions of Section 25.857(e) has been previously granted to IAI for cargo conversions of B767-200SF, B747-200/-300SF and B737-300SF/RB/QC aircraft.

1. The cargo operators need for their missions a number of support personnel, necessary for the safe handling of the cargo in the process of loading/offloading and for in-flight attendance of the cargo. Such personnel are obviously needed both at departure and destination of a cargo flight. It is important that the cargo handlers are present upon airplane arrival, particularly if perishable goods or live animals are carried. The most efficient way to assure their attendance at destination airport is to transport them aboard the cargo flight.
2. Among their various missions, the cargo operator may have to carry particular kinds of goods, such as live animals, hazardous materials, valuable or perishable cargo. Such types of cargo cannot be left unattended, even for the duration of a flight, and the presence of personnel qualified in their handling is necessary on the airplane on which they are carried. Safety and efficiency of the operation will therefore be enhanced.
3. Cargo operators also need to have qualified personnel necessary for operation and maintenance purposes at various locations. They will optimize their missions if

they are permitted to carry their personnel aboard their cargo flights, thus saving travel by regular passenger flights.

4. The categories of the supernumerary persons for which this exemption is requested are as defined on [CFR] Section 121.583(a), they are trained as to the autonomous use oxygen masks, emergency equipment, and emergency exit operation.

It will also be required that the operator allows access to the supernumerary seats only to persons trained in the necessary emergency procedures. These persons must be physically capable of using the rope descent means and will not need assistance by a crewmember. The non-crewmembers shall be briefed preflight about the emergency procedures by the flight crew. The necessary instructions shall be incorporated in the Airplane Flight Manual.

Supporting arguments for the additional sections affected

The airplane reconfiguration for carriage of cargo does not enable providing assist space adjacent to the exits as required by Section 25.813(b). The use of assist space adjacent to the emergency exits is not necessary, however, as the considered categories of personnel will be trained for operation of main exit doors and for autonomous evacuation.

The exemption from Section 25.785(j) requirement to provide a handhold is justified by providing means that enable flight deck crew to warn persons in the main deck of imminent turbulence, signaling them of the need to return to their seats and fasten seat belts. Appropriate instruction placards will be installed at the entrance to the main deck cargo compartment and the requirement for pre-flight briefing of the supernumeraries in this respect will be added to the AFM.

The requirements of Section 25.1447(c)(1) to have automatic presentation of oxygen dispensing units before the cabin pressure altitude exceeds 15K ft are compensated by the fact that the supernumeraries will have knowledge of equipment location and use and by their seating in direct view of the "Use Oxygen" instruction sign. This signal, combined with the training and briefing provided to the supernumeraries is considered equivalent to the self dropping masks of a passenger airplane.

Masks shall be accessible to seated occupants of 5'2" to 6'3" stature. The quantity of oxygen is sufficient for the maximum duration of the flight including an intended decompression for suppression of cargo fire.

A portable oxygen bottle with full face mask must be carried by each person entering the Class E cargo compartment at all times. An automatic and manual aural and visual alert system is provided to instruct the person to don the oxygen mask in case of drop of cabin pressure.

Public interest

Granting the requested exemption will be in the public interest, as by allowing the carriage of the supernumerary persons aboard the cargo flights the operators will be able to optimize the safety conditions of the cargo operation and to make the operation more efficient.

Improving the utility of the airplanes reduces the total number of airplanes and affects the environment and the airports' congestion.

Federal Register publication

A summary of this petition was not published in the *Federal Register*. This exemption does not set a precedent and any delay in acting on this petition would be detrimental to Israel Aircraft Industries.

The FAA's analysis

By allowing the carriage of the supernumerary persons 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 air cargo.
- A significant disruption of air commerce could occur if the petition were not granted.
- The FAA has granted several exemptions for the carriage of supernumeraries 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 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 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 petitioner has requested that the double flight attendant seat just forward of the left hand entry door be available for supernumerary use. In addition to the two observer seats in the flight deck, this seat would allow for up to four supernumeraries on board.

The requirement of § 25.785(j), Amendment 25-88, for handholds 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 an acceptable level of safety will be provided by the crew-operated visual alert system. This visual alert system enables the crew to indicate, at the onset of turbulence, that supernumeraries in the cargo compartment must return to their seats. The visual alert must be recognized in the accessible areas of 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.

With respect to the lack of an assist space adjacent to each exit as required by § 25.813(b), Amendment 25-116, 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, the flightcrew can easily provide instructions and some physical assistance to non-crewmembers, if needed, because the non-crewmembers would be seated in relatively small confines within easy access of the flight deck. Although the petitioner has requested relief from § 25.813(b)(3), we find this paragraph is not applicable and find it necessary to grant relief from §§ 25.813(b)(1), (4), and (6) instead.

To comply with §§ 25.855(h)(2) and 25.857(e)(4), there must be suitable means of preventing smoke penetration into the occupied areas. 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 open a door through the smoke barrier between the cargo and the supernumerary compartments. In order 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 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 Class E cargo compartment. 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. This smoke must be considered when demonstrating compliance with § 25.855(h)(2). Flight testing is required for compliance.

The petitioner has proposed a visual alert to indicate that persons must return to their seats and secure the smoke barrier (i.e., close the door) if there is a fire. On the proposed airplane, we concur with the petitioner that an acceptable level of safety will be provided by the crew-operated visual alert system. This visual alert system enables the crew to indicate, at the onset of smoke/fire, that supernumeraries in the cargo compartment must return to their seats. The visual alert must be recognized in accessible areas of the Class E cargo compartment, and indicate, during 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 would need to be established to ensure that the flightcrew member alerts the supernumeraries to return to their seats and secure the smoke barrier door at the onset of a fire. The pre-flight briefing would need to explain this alert to the supernumeraries.

The FAA has determined that, due to the way that fire in the cargo compartment is to be controlled, supernumeraries (persons) on the airplane must have been found physically fit by the operator. Supernumeraries must also have been briefed on the use of the emergency equipment. These limitations on the occupants are consistent with previous approvals and are 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, occupants in the supernumerary area and the Class E cargo compartment will not have this indication. The petitioner has proposed an automatically activated, illuminated "Use Oxygen" sign installed in direct view of the seated supernumeraries. Additionally, a lighted “Return to seat” sign shall be installed at the galley area, activated automatically (with a manual backup) and simultaneously with the “Use Oxygen” sign. Illumination of the signs, combined with an audible warning signal over the public address system (PA) in the event of cabin decompression, provides an acceptable level of safety, as long as an additional automatically activated aural and visual decompression alert is installed and immediately recognizable throughout the accessible areas of the Class E cargo compartment.

Additionally, the petitioner proposed to provide supernumeraries with portable walk around oxygen bottles equipped with a supplemental passenger oxygen mask when accessing the main deck Class E cargo compartment. The proposed oxygen supply to any person entering the Class E cargo compartment is provided by an 11ft³ portable oxygen bottle with full face mask, which must be carried by the person entering the compartment at all times. 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 his or her seat following a rapid decompression 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, that 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 NTPD (Normal Temperature and Pressure Dry) 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.

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. The FAA has determined that an acceptable means of compliance is 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 regarding the location and use of oxygen equipment and the alerts that indicate the need to don oxygen equipment. The oxygen units must be sized adequately for continuous and uninterrupted use during worst-case flight duration following decompression.

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 compartment if an Airplane Flight Manual (AFM) 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 limitation.

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. We have 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. We have divided 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. 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 one supernumerary (groom/handler) for every three or four horses. We agree that this recommendation is appropriate to ensure safety of flight.

For the first type of operation, we understand that the industry standard for carriage of horses is one supernumerary for every three or four horses. Considering the size of the 737 airplane, there could be several horses or other large animals in the main deck cargo compartment, which would require an appropriate number of supernumeraries (grooms/handlers). In the past, under certain conditions, we have granted exemptions for a greater number of supernumeraries with access into the main deck Class E cargo compartment. These conditions have included limiting the permitted cargo to only large live animals and associated cargo. We have determined that live animals are less flammable cargo than other cargo, therefore, we have allowed a greater number of supernumeraries access into the cargo compartment. The petitioner has requested that a maximum of four 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 access into the cargo compartment to a small number of supernumeraries (one to three). During flight this number of supernumeraries should be capable of addressing the access needs for the hazardous materials and valuable or perishable goods.

Concerning the third type of operation, live animals requiring care/attention during flight and cargo, we understand that 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 four supernumeraries be allowed access to the 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 four supernumeraries to be allowed access into the main deck Class E cargo compartment in flight for the care/attention of live animals and inspection of 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. 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, if Class E cargo

compartment access is approved for four or more supernumeraries for this type of operation, a portable system (e.g., smoke hood, full face mask oxygen system) must also be carried by each supernumerary.

The FAA accepts the petitioner's proposal to equip all supernumeraries with full face masks when they enter the Class E cargo compartment.

The FAA's decision

In consideration of the foregoing, I find that a 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, Israel Aircraft Industries is hereby granted an exemption from 14 CFR 25.785(j), 25.813(b)(1), (4), (6), 25.857(e), and 25.1447(c)(1). The petition is granted to the extent necessary to allow type certification of Boeing Model 737-400 series airplanes converted from passenger to freighter configurations with provisions for the carriage of supernumeraries. The following conditions and limitations apply and numbers 1 through 5, 7, 10 and the preflight briefings required by 8 and 9, below, must be documented in the Limitations Section of the AFM:

1. A maximum of two supernumeraries may occupy the area just aft of the flight deck. The total maximum occupancy of the airplane is limited to six persons, including the flightcrew (two on-duty flightcrew members, and up to four off-duty flightcrew members, observers or supernumeraries).
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 accessing the cargo areas during taxi, take-off, and landing. 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/attention during flight and associated material only, no other cargo. The maximum number of supernumeraries allowed in the cargo compartment is four.
 - Cargo only, no live animal requiring care/attention during flight. The maximum number of supernumeraries allowed in the cargo compartment is three.

- Carriage of live animals, requiring care/attention during flight, and cargo (mixed cargo and live animals). The maximum number of supernumeraries allowed in the cargo compartment is four.

4. The flight crew must conduct a preflight briefing that includes the following in addition to the standard briefing required for operation:

- a. The cargo compartments must not be accessed during taxi, take-off and landing.
- b. The use of the exits, including instructions to inspect the ground to determine whether a safe landing can be achieved before using an assist means.
- c. The use of all emergency equipment including, but not limited to, supplemental oxygen/protection from smoke inhalation system.
- d. The meanings of the decompression, turbulence, and smoke/fire alerts.
- e. The placards required in limitation #10.

5. The operator must determine that each supernumerary is physically able and trained to accomplish the necessary emergency procedures.

6. Supernumerary Supplemental Oxygen and Protection from Smoke Inhalation:

a. Locations and Use:

(1) Supplemental oxygen equipment with a mask connected to it must be located so each occupant can put on the mask and activate oxygen flow while seated.

(2) There must be at least one portable oxygen unit with a mask connected to it 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).

(3) Each supernumerary must carry a portable oxygen unit with a mask connected to it whenever he or she is in the cargo compartment during flight.

b. Design Requirements:

(1) The oxygen units must provide an indication to the user when oxygen is flowing.

- (2) 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 is readily accessible for the remainder of the decompression.
- (3) To ensure adequate protection during non-sedentary use, 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 to 25,000 feet cabin altitude.
- (4) 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, connected to an oxygen bottle that supplies a flow rate of at least 4 liters per minute NTPD (Normal Temperature and Pressure Dry) 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.
- (5) 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). The proposed full face mask system for all supernumeraries is acceptable provided it meets the criteria in these limitations and conditions.

7. Training:

The supernumeraries must be trained in the use of the oxygen/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:

Based on the petitioner's proposal, an automatically activated aural and visual decompression alert must be present and immediately recognizable throughout the supernumerary seating area and in accessible areas of the Class E cargo compartment to notify supernumeraries when to don oxygen masks. The training must include the sound of the alert, the meaning of the alert, and the response to the alert (i.e., procedures for donning the masks and activating the flow of oxygen).

9. Turbulence, Smoke and/or Fire Alert:

Based on the petitioner's proposal, a flightcrew activated visual alert, which is recognized throughout the supernumerary seating area and in the main deck Class E cargo compartment, must be installed to indicate that, in the event of turbulence, fire or smoke in a Class E cargo compartment, persons must return to their seats and ensure that the smoke barrier is secured (i.e., the door is closed). Appropriate procedures and limitations must be established to ensure that, at the onset of a turbulence, fire or smoke event, the flightcrew alerts the supernumeraries to return to their seats and secure the smoke barrier.

10. Placards:

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

- Do not occupy the Class E cargo compartment during taxi, take-off and landing.
- Access is limited to the care and handling of animals and cargo only.
- Access is limited to a maximum of three persons when hauling cargo only (no live animals requiring care and attention). Access is limited to four persons when transporting live animals.
- The smoke barrier must be secured (i.e., the door 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 protection 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/smoke being detected inside a Class E cargo compartment.

11. 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, 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. A standard airplane public address (PA) system must be installed. It must be audible throughout the supernumeraries' seating area and must be activated either from the flightdeck or from the supernumerary seating area.

13. Flight Tests:

Flight tests must be conducted in accordance with § 25.855(h) 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 8 and 9 are not required if an AFM 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.

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Signed by Ali Bahrami

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