

Exemption No. 8587B

**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), 25.857(e),
and 25.1447(c)(1) of Title 14, Code of Federal
Regulations

Regulatory Docket No. FAA-2005-21288

GRANT OF EXEMPTION

By letter dated October 22, 2007, Mr. Ami Rogev, Director, Certification, IAI Aircraft Division, Bedek Aviation Group, Israel Aircraft Industries (IAI) Ltd., Ben Gurion Airport, Israel 70100, petitioned for an amendment to Exemption No. 8587A, issued on November 3, 2005. That exemption granted IAI certain relief from the requirements §§ 25.785(j), 25.857(e), and 25.1447(c)(1) of Title 14, Code of Federal Regulations (14 CFR), to allow carriage of eight non-crewmembers (commonly referred to as supernumeraries), located aft of the flightdeck, on Boeing Model 747-400 airplanes converted from either an all passenger or a cargo combi configuration to a freighter configuration. The petitioner requests an amendment to Exemption No. 8587A to increase the number of supernumeraries from 8 to 12.

The petitioner requests relief from the following regulations:

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

Section 25.857(e), at Amendment 25-93, requires, in 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 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. There must be at least two oxygen dispensing units connected to oxygen terminals in each lavatory.

Related sections of 14 CFR:

Section 121.583(a) contains, in 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:

Israel Aircraft Industries is requesting that the exemption 8587A be amended to allow an increase in the number of supernumeraries permitted on the airplane from 8 to 12 and a corresponding increase of the total airplane occupancy from 12 to 16. The typical extended range missions for the Boeing Model 747-400 airplane require the operators to carry replacement flightcrew members on these flight. These additional flightcrew members typically occupy the two observer seats located on the flight deck. The increase in the number of supernumeraries allowed on the airplane to twelve will allow an increase of the number personnel handling cargo. The carriage of additional supernumeraries serves the overall public interest by improving cargo loading and unloading efficiency, reducing airplane turnaround time at airports, and thus contributing to a reduction in airport congestion.

To accommodate the supernumeraries, additional seats and oxygen are provided in the upper deck compartment located aft of the flight deck. All other emergency equipment is unchanged and has adequate capacity to accommodate the additional occupancy on the airplane. The previous exemptions have included provisions for access to the Class E cargo compartment in-flight by supernumeraries to attend to live animals, hazardous materials, or valuable or perishable goods that cannot be left unattended, even for the duration of the flight.

Israel Aircraft Industries Ltd., Bedek Aviation Group's complete petition can be found under docket number is FAA-2005-21288 at www.regulations.gov.

Federal Register publication

The FAA has determined that good cause exists for waiving the requirement for Federal Register publication because the amended exemption, if granted, would not set a precedent and any delay in acting on this petition would be detrimental to IAI.

The FAA's analysis follows:

The FAA considers the petitioner's proposal to amend that exemption 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 was not granted.
- The FAA has granted several exemptions for the carriage of supernumeraries with access into the Class E cargo compartment in-flight to attend to cargo on freighter airplanes.

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 and the number of supernumeraries involved. 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 two types of operations. They are:

1. Carriage of live animals and associated material only, no other cargo.
2. Cargo only, no live animal carriage.

In the first type of operation we understand that the industry standard for the carriage of horses is one supernumerary for every three or four horses. Considering the size of the 747-400 airplane there could be several dozen horses in the main deck cargo compartment. In considering this type of operation, we have considered that live animals are less flammable than other cargo. Therefore, we have allowed less restrictive access to the cargo compartment.

With regard to the second type of operation, we have 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.

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.

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 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 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. This 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 allowed, an alert, aural, visual, or both, operated by a flightcrew member and recognized in the Class E cargo compartment was required to be installed. The alert immediately notified the supernumeraries in the compartment that there was smoke/fire in the compartment. The aural, visual, or both, 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. Appropriate procedures and limitations were required to ensure that a flightcrew member alerted the supernumeraries to return to their seats and secure the smoke barrier at the onset of a fire. The pre-flight briefing included an explanation of this alert to the supernumeraries.

On this certification program the petitioner has proposed that smoke/fire and decompression events would have identical aural and visual alerts and that the response to the alerts would be the same. That is, the supernumeraries inside the Class E cargo compartment would immediately don their oxygen masks, initiate oxygen flow, and then return to their seats. Although this procedure differs from previous programs, we find this action acceptable, provided the portable oxygen equipment provided to the supernumeraries, in addition to meeting the requirements of § 25.1443(a) or (b), also meets the appropriate requirements of protective breathing equipment (PBE) in § 25.1439. The same aural/visual alerts, and procedures proposed for both a decompression and smoke/fire event are therefore acceptable.

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 tend to animals or hazardous cargo. When operating above 25,000 feet, § 25.1447(c)(1) requires an “immediately available” supply of oxygen for each supernumerary. To provide an acceptable level of safety while they are in the Class E cargo compartment, each supernumerary must carry on his or her person a portable oxygen bottle with a mask connected to it.

Section 25.1447(c)(1) also requires automatic presentation of the oxygen dispensing units. For seated passengers in typical passenger airplanes, the automatic presentation of masks throughout the cabin indicates the need to don an oxygen mask. However, supernumeraries in the Class E cargo compartment would not have this indication. To provide an acceptable level of safety, an automatically activated aural decompression alert must be provided that is immediately recognizable throughout the accessible areas in the Class E cargo compartment. If there are two or more aural alerts that supernumeraries in the Class E cargo compartment are expected to react to differently (e.g., “don oxygen mask, initiate the flow of oxygen, return to seat” versus “return to seat immediately”) there must be an automatic visual alert in addition to the automatic aural alert for the decompression event. As a backup to the automated alert system, the flightcrew members must be able to manually initiate the alerts. However, as discussed above, on this program the petitioner has proposed to have both aural and visual alerts for decompression and smoke/fire with the supernumeraries responding in the same way for both events.

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

The petitioner has not requested an exemption from the oxygen requirements of § 25.1447(c)(1) for the lavatory and the area with the supernumerary seats. Therefore, these areas must comply with § 25.1447(c)(1).

The requirement of § 25.785(j), at 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 return to their seats. The visual alert must be recognized in accessible areas in the Class E cargo compartment, and indicate, during turbulence, that persons must return to their seats.

Configurations may be approved for carrying cargo that would not require supernumeraries to access the Class E cargo compartment. For these configurations, an aural decompression alert is not required to be recognized 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 limitations.

The FAA has a concern about the removal of an incapacitated person from the cargo compartment since the access means to the main deck cargo compartment is a ladder. Israel Aircraft Industries, Ltd. should develop procedures for removing an incapacitated person from the cargo compartment and provide these procedures to the airplane operators. There is no need to combine this condition with any other failure condition (i.e., only normal flight conditions need to be considered).

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 an amended 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 Acting Administrator, Israel Aircraft Industries, Ltd. is granted an amended exemption from 14 CFR 25.785(j), 25.857(e), and 25.1447(c)(1) to the extent necessary to allow type certification of Boeing Model 747-400 all passenger or combi configuration airplanes converted to a freighter configuration airplanes, with provisions for the carriage of supernumeraries. This amendment includes substantial modifications to limitations numbers 1, 4, 5, 6, 7, 8, and 11 of Exemption numbers 8587 and 8587A. This amendment adds limitations numbers 12, 13, and 14. For clarity, all of the limitations are reproduced in this amendment. The following limitations and conditions apply:

1. A maximum of 12 supernumeraries may occupy the area just aft of the flightdeck. The total maximum occupancy of the airplane is limited to 16 persons, including the flightcrew (2 on-duty flightcrew members and 2 off-duty flightcrew members).
2. Supernumeraries are limited to the categories specified in §§ 121.583(a)(1) through 121.583(a)(7).
3. Prior to each flight, a flightcrew member must brief each supernumerary on 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 and emergency equipment.
4. The operator must determine that each supernumerary is physically able and trained to accomplish the necessary emergency procedures.
5. Supernumeraries' Oxygen:
 - a. 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. The unit must provide an indication to the user when oxygen is flowing.

- b. The portable oxygen unit must meet the performance requirements of §§ 25.1443(a) or 25.1443(b), or the equipment must be shown to protect the supernumerary from hypoxia at an activity level required to return to his or her seat following a rapid decompression to 25,000 feet cabin altitude.
 - c. The portable units must be located outside the cargo compartment (e.g., in the common area).
 - d. Each supernumerary must carry a portable oxygen unit whenever he or she is in the cargo compartment during flight.
 - e. The supernumeraries must be trained in the use of the portable oxygen units. The supernumeraries must also be trained in making the determination whether oxygen is being delivered to the dispensing units.
 - f. 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 for the remainder of the decompression is readily accessible.
 - g. Based on the petitioner's proposal, the lavatory and the area with the supernumerary seats must meet the requirement of § 25.1447(c)(1).
6. 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. For airplanes that retain the passenger evacuation slides on the upper deck and associated emergency lighting systems, these systems are acceptable for this condition.
7. For the exits designated for supernumerary use, 12 descent devices (commonly known as inertia reels) and 12 harnesses for use with the descent devices must be provided for supernumerary use. This condition does not apply to airplanes that retain the passenger evacuation slide on the upper deck.
8. Alerting Requirements:
- a. Must be distinctive and effective. The alert for turbulence must be clearly distinguishable from the alerts for decompression/fire/smoke.
 - b. 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.

- c. 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.

9. Decompression Alert:

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

10. Turbulence Alert:

A flightcrew member operated aural or visual alert, which is recognized in accessible areas in the Class E cargo compartment, must be installed to indicate, during turbulence, that persons must return to their seats. Appropriate procedures and limitations must be established to ensure that the flightcrew member alerts the supernumeraries to return to their seats at the onset of turbulence and prior to landing. The pre-flight briefing must explain this alert to the supernumeraries. This briefing, alert, and associated procedures and limitations are not required if an airplane flight manual limitation is established to prohibit supernumeraries in the Class E cargo compartment during flight.

11. Smoke/Fire Alert:

A flightcrew member operated aural or visual alert, which is recognized in the Class E cargo compartment, must be installed. This aural or visual alert is to indicate that, during a fire in the Class E cargo compartment, persons must return to their seats and ensure that the smoke barrier is secured (i.e., the door or curtain is closed). Appropriate procedures and limitations must be established to ensure that, at the onset of a fire, the flightcrew member alerts the supernumeraries to return to their seats and secure the smoke barrier. The pre-flight briefing must explain this alert to the supernumeraries. This briefing, alert, and associated procedures and limitations to signal the supernumeraries are not required if an airplane flight manual limitation is established to prohibit supernumeraries in the Class E cargo compartment during flight.

12. Placards:

- 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 3 persons unless transporting live animals and associated material. Access is limited to 12 persons when transporting live animals.
 - 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. A portable oxygen bottle (with mask attached) must be carried at all times when in the cargo compartment.
 - f. Smoking is not allowed in the cargo compartment.
 - g. The compartment must not be entered in case of fire/smoke being detected inside the Class E cargo compartment.
13. Class E Cargo Compartment Access Limitations: Access into the cargo compartment in-flight is divided into two different types of operations and they are as follows:
- a. Operations for carriage of live animals and associated material only, no other cargo. The maximum number of supernumeraries allowed in the cargo compartment in-flight is 12.
 - b. Operations for cargo only, no live animal carriage. The maximum number of supernumeraries allowed in the cargo compartment in-flight is 3.
14. Airplane Flight Manual (AFM) Supplement:
- The following limitations numbers 1 through 4, 6 through 11, and 13, above, and 15, below, must be documented in the Limitations Section of the Airplane Flight Manual.
15. Supernumeraries are prohibited from being in the cargo area below the smoke barrier during taxi, takeoff, landing, and flight. The pre-flight briefing must inform supernumeraries of this requirement.

Note: The briefings and associated procedures in limitations numbers 8, 9, and 10 to signal the supernumeraries in the Class E cargo compartment are not required if an Airplane Flight Manual limitation is established to prohibit supernumeraries in the Class E cargo compartment during flight

This amendment is part of, and will remain attached to, Exemption No. 8587 and 8587A.

Issued in Renton Washington, on June 27, 2008.

/s/

Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service