

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

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

PARTIAL GRANT OF EXEMPTION

By letter A-5460, dated May 5, 2005, Mr. Samuel Ifergan, Senior Director Quality Assurance, Bedek Aviation Group, Israel Aircraft Industries Ltd., Ben Gurion Airport, Israel 70100, petitioned the Federal Aviation Administration (FAA) for an exemption from §§ 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 which have been converted from either an all passenger or a cargo combi configuration to a freighter configuration.

The petitioner requests relief from the following regulations:

Section 25.785(j), at Amendment 25-88, requires, in pertinent 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 pertinent part, that when a Class E cargo compartment is installed on the airplane, the airplane is used for carriage of cargo only.

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

distributed throughout the cabin as practicable. There must be at least two oxygen dispensing units connected to oxygen terminals in each lavatory.

Related sections of the regulations:

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

The petitioner's supportive information is as follows:

“Introduction

“IAI has requested to certify (STC) [supplemental type certificate] a major modification of a Boeing Model 747-400 aircraft from combi to a special freighter (SF) configuration. The program shall be certified by the CAAI [Civil Aviation Administration of Israel], then by the FAA via a validation process. The program has been identified by the CAAI as Project 317. The appropriate G1 [issue] paper has defined the certification basis. IAI is requesting to be granted with an exemption from meeting certain requirements, as described below.

“The exemptions requested are related to:

“Carriage of eight (8) non-crew persons (supernumeraries) on the upper deck compartment and their access into the Class E cargo compartment during flight.

“Use of portable oxygen bottles in place of self-presenting oxygen masks by persons entering the Class E cargo compartment.

“Relief from the requirement for hand holds to persons entering the Class E cargo compartment.

“The exemptions are requested for all Boeing Model 747-400 aircrafts modified to freighter under IAI STC.

“Sections of CFR 25 affected

“Section 25.857(e), *cargo compartment classification*, Amendment 25-93, requires, in pertinent part, that when a class ‘E’ Cargo Compartment is installed on an airplane, the airplane is used for carriage of cargo only.

“Section 25.1447(c)(1), *equipment standards for oxygen dispensing units*, Amendment 25-116, requires, in pertinent part, that oxygen dispensing unit must be automatically presented to occupants before cabin pressure altitude exceeds 15,000 feet.

“Section 25.785(j), *seats, berths, safety belts, and harnesses*, Amendment 25-88, requires, in pertinent part, handholds to enable passengers to steady themselves while using the aisles in the event of moderate turbulence.

“Related Sections of the CFR

“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 persons who may be carried aboard an airplane in part 121 service without complying with the requirements of part 121 pertaining to carriage of passengers.

“Description of Conversion Configuration

“Flightdeck

“The original flightdeck is certified for maximum occupancy of 2 crewmembers and 2 observers. Flightdeck layout is not affected by the modification.

“The Boeing Model 747-400 flightdeck is originally fitted and certified with an overhead emergency exit hatch for the flightcrew, using inertia descent devices. Flightdeck emergency exit is retained unchanged from the original TC [type certificate] configuration.

“Upper Deck supernumeraries compartment

“The Boeing Model 747-400 upper deck is originally fitted and certified with two Type I floor level exits, one on each side of the fuselage, equipped with assist devices (slides). Emergency exits are retained in the original TC configuration.

“The original upper deck of the Boeing Model 747-400 is certified for occupancy of 45 passengers, depending on configuration. The modified aircraft will retain seating for eight non-crew (supernumerary) persons only. Total seating in the aircraft (including flight compartment) shall be 12 persons.

“The following major items are retained from the Type Certificated configuration: crew rest area, lavatory 4U, four (4) passenger seats (two on each side of the fuselage), L.H. & R.H. emergency exits, emergency lighting, escape path lighting, passenger PSU including supplemental oxygen self-presenting dispensing units and interior envelope, except as noted below.

“The following are main changes made in the upper deck layout: a new partition/smoke barrier is located at the aft end of the upper deck FS 740, new crew galley is installed in place of deleted 6U lavatory, new ladder enclosure cabinet installed. All cabin furnishing located aft of FS740 are removed. The interior envelope is modified to fit the new configuration.”

“Main deck cargo compartment

“The main deck Class E compartment is separated from the upper deck compartment by a smoke barrier and ladder enclosure. Access to the main deck Class E cargo compartment is gained through a door leading to the folding ladder. A placard will be conspicuously located on the inboard and outboard side of the enclosure door, which states:

"MAIN DECK CARGO COMPARTMENT ACCESS

KEEP DOOR CLOSED EXCEPT DURING ENTRANCE AND EGRESS

IN THE EVENT OF FIRE, DO NOT OPEN"

“A portable ‘walk around’ oxygen bottle with a full-face mask will be installed at the entrance to the cargo compartment.

“Three PBE [portable breathing equipment] units will be installed in addition to the existing equipment in the flightdeck, two on the upper deck and one in the main deck cargo compartment. The equipment shall meet the requirements defined in section 25.1439.

“Halon fire extinguishers will be installed in the main deck Class E cargo compartment, meeting the requirements of section 25.851.

“Aural-Visual alerting system

“Two alert means will be provided in order for the flightcrew to communicate to person or persons located in the cargo compartment that conditions exist requiring immediate return of the person to the main deck and/or donning of oxygen equipment. The alerts shall be provided as follows;

“ ‘Return to seat’

A visual alert signal, flashing of every third main deck cargo compartment light for 30 seconds at 0.5 second cycle, concurrent with activation of ‘Return to Seat’ will indicate to a person in the main deck cargo compartment to return to his seat on the upper deck. The flightcrew will manually activate the signal in case of imminent turbulence or cargo compartment smoke warning.

“ ‘Don Oxygen Mask’

An aural alert signal, sounded by warning horns located in the main deck cargo compartment, will indicate to a person in the main deck cargo compartment to don a portable oxygen mask. This signal will be automatically activated in case of a drop in cabin pressure or manually activated by the flightcrew. The initiation of this alert signal will automatically activate the visual ‘Return to Seat’ signal in the main deck cargo compartment.

“A placard will be conspicuously located on the outboard side of the enclosure door, which states:

"PORTABLE OXYGEN BOTTLE MUST BE CARRIED BY PERSON ENTERING CARGO COMPARTMENT IN FLIGHT

RETURN TO YOUR SEAT WHEN CARGO COMPARTMENT LIGHTS ARE FLASHING

DON OXYGEN MASK AND RETURN TO SEAT IMMEDIATELY WHEN CARGO COMPARTMENT HORN SIGNAL IS SOUNDED"

“This procedure will be incorporated into the AFM [airplane flight manual] supplement and be included as part of the pre-flight briefing.

“Requested Exemption

“An exemption is requested from CFR 25.857(e) to permit carriage of 8 non-crew passengers on an all freighter airplane with a Class E cargo compartment, including permission to access the Class E cargo compartment by non-crewmember (supernumerary) during flight.

“An exemption is requested from CFR 25.1477(1) to permit persons entering the Class E compartment the use of a portable oxygen mask instead of a self-presenting mask.

“An exemption is requested from CFR 25.785(j) to obtain relief from the requirement for handholds for persons walking in the cargo compartment.

“Supporting Arguments

“In order to optimize the usage of the Boeing Model 747-400 as a cargo airplane, operators need to be able to accompany their cargo by people whose function is to take care of sensitive cargo and of loading and unloading tasks at any port of arrival. Their presence in the aircraft ensures they will be immediately available on arrival to handle the cargo. This is most important in case of transport of perishable goods, items of value, etc.

“Some of the cargo items being transported may include live animals, hazardous materials, or valuable or perishable goods that can not be left unattended, even for the duration of the flight, and the presence of personnel trained and qualified in their handling is necessary on the aircraft on which they are carried. In-flight inspection of the cargo, especially live animals and hazardous materials, enhances safety.

“Some of the locations serviced by the cargo carriers may not have ground maintenance centers capable of performing necessary tasks for the operator aircraft nor passenger

flights to carry maintenance personnel to the location. The ability to transport company maintenance personnel on company flights increases flexibility of operation.

“Non-crewmember passengers carried on Boeing Model 747-400SF airplanes are limited to categories listed on section 121.583(a)(1) thru (7). The non-crewmembers, commonly referred to as supernumeraries, shall be physically capable of performing their emergency and normal cargo handling duties, and trained in the use of emergency equipment

“When supernumeraries are seated in their seats or while in the lavatory on the upper deck, self-presenting oxygen masks indicate the need to don an oxygen mask. Since self-presenting oxygen masks are not available to persons entering the Class E compartment, an equivalent level of safety is provided by the visual alert system that indicates to compartment occupants the need to immediately don the portable oxygen masks, which they are required to carry while in the compartment.

“Handhold provisions in the upper deck per the requirements of CFR 25.785(j) are retained from the passenger configuration. Since installation of handholds in the main deck cargo compartment is impractical, an acceptable level of safety is provided by the crew operated alert system ability to indicate, at the onset of turbulence to persons in the cargo compartment, to return to their seats.

“Flight Manual supplement shall include the requirement for flightcrew pre-flight briefing of the supernumeraries, including procedures of egress to the Class E compartment, and of emergency procedures including the aural-visual alert signals. Flight Manual supplement shall include the flightcrew procedures related to the operation of Class E aural-visual alert signals.

“Conclusion”

The granting of the requested exemptions will not degrade the level of safety provided by the regulations. The granting of the requested exemptions will be in the public interest for the following reasons:

The supernumeraries will be trained in the use of emergency equipment and will receive a pre-flight briefing from the flightcrew;

An equivalent level of safety for the self-presenting oxygen mask requirement will be provided by the visual alert system that indicates the need to immediately don the portable oxygen masks, which the supernumeraries will be required to carry while in the Class E cargo compartment; and

An equivalent level of safety for the handhold requirement will be provided by the crew-operated alert system, which will indicate the onset of turbulence and instruct the supernumeraries to return to their seats.

A summary of the petitioner's request for exemption was published in the Federal Register on June 8, 2005 (70 FR 33578). No comments were received.

The FAA's analysis/summary is as follows:

The demand for shipment of goods by air cargo continues to grow worldwide. The modification of Boeing Model 747-400 all passenger and cargo combi configurations to freighter configurations is being done to support this increasing demand in a manner that is very economical to air cargo operators. The modified 747-400 configuration provides additional upper deck cabin seating for supernumeraries (who must meet the criteria defined in § 121.583(a)(1) through (a)(7)). Having necessary supernumeraries immediately available for cargo handling and management reduces operational costs by not having supernumeraries take separate commercial flights to the cargo destination, which also reduces the turn-around time for the cargo carrier. This services the overall public interest by virtue of the net cost savings for cargo shipment, resulting in lower costs for goods and material transported as air cargo, as ultimately reflected in lower consumer costs for goods transported as air cargo.

The supernumeraries will be trained in the use of emergency equipment and will receive a pre-flight briefing from the flightcrew;

An equivalent level of safety for the self-presenting oxygen mask requirement will be provided by the visual alert system that indicates the need to immediately don the portable oxygen masks, which the supernumeraries will be required to carry while in the Class E cargo compartment; and

An equivalent level of safety for the handhold requirement will be provided by the crew-operated alert system, which will indicate the onset of turbulence and instruct the supernumeraries to return to their seats.

Class E cargo compartments are usually remote from the flightdeck and encompass the entire interior of the airplane. The means of controlling fires that might occur in the cargo compartment is to starve the fires of oxygen. This is accomplished by depressurizing the airplane and maintaining an altitude that will not support combustion. The FAA has previously granted exemptions for carriage of persons in addition to crew on freighter airplanes and allowed access to the cargo compartment to care for animals and hazardous and sensitive cargo, provided that certain conditions are met. These conditions have varied depending on the airplane design and the number of persons involved.

In all cases, 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 flightdeck and the supernumerary compartment. The petitioner has indicated that this configuration is intended to allow supernumeraries to enter the Class E cargo compartment and hence open the smoke barrier between the cargo compartment and the supernumerary

compartment. In order to provide an appropriate level of safety, the petitioner has proposed to install a placard indicating that the smoke barrier is to be secured (i.e., the door or curtain must be closed) when there are no occupants in the Class E cargo compartment. The placard must be located in a conspicuous place, either on or next to the smoke barrier.

Since access into the Class E cargo compartment is being requested, an aural or visual annunciation operated by the flightcrew and recognized in the Class E cargo compartment must be installed to indicate that persons must return to their seats and secure the smoke barrier (i.e., close the door or curtain) during a fire in the Class E cargo compartment. Appropriate procedures and limitations would need to be established to ensure that the flightcrew signals the supernumeraries to return to their seats and secure the smoke barrier at the onset of a fire. The pre-flight briefing would need to explain this annunciation to the supernumeraries.

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

The petitioner indicates that this configuration is intended to allow the supernumeraries to enter the Class E cargo compartment. In order to provide an acceptable level of safety to the “immediately available” requirement of § 25.1447(c)(1), each supernumerary must carry on his or her person a portable oxygen bottle with a mask connected to it while in the Class E cargo compartment.

Section 25.1447(c)(1) also requires automatic presentation of the oxygen dispensing units. For seated passengers in typical passenger airplanes, the automatic presentation of masks throughout the cabin indicates the need to don an oxygen mask. However, supernumeraries in the Class E cargo compartment will not have this indication. To provide an acceptable level of safety, an automatically activated aural decompression signal must be immediately recognizable throughout accessible areas in the Class E cargo compartment. Operation of this signal must be automatic with flightcrew manual action as a backup.

Supernumeraries must be trained about the location and use of the oxygen equipment and the signals for its use. Additionally, the oxygen units must be sized adequately for continuous and uninterrupted use during worst-case flight duration following decompression.

The intent of the requirement for handholds is to enable passengers to steady themselves when moving about the cabin, in the event of moderate turbulence. The supernumerary seating area must be considered in regard to this requirement, since persons may move about this area. The FAA recognizes that it would be impractical to require handholds in the Class E cargo compartment. The FAA finds that an acceptable level of safety for justifying an exemption will be provided without handholds if at the onset of turbulence,

a flightcrew-operated aural or visual annunciation in the supernumerary seating area and the Class E compartment indicates that persons must return to their seats as proposed by the petitioner.

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, Israel Aircraft Industries, Ltd. is hereby granted a partial exemption from 14 CFR 25.785(j), 25.857(e), and 25.1447(c)(1). The petition is granted to the extent required to permit type certification of Boeing Model 747-400 series airplanes, which have been converted from either an all passenger or a cargo combi configuration to a freighter configuration, with provisions for the carriage of supernumeraries. The following limitations apply and must be documented in the limitations section of the airplane flight manual:

1. A maximum of eight supernumeraries may occupy the area just aft of the flightdeck. The total maximum occupancy of the airplane is limited to 12 persons including the flightcrew.
2. Supernumeraries are limited to the categories specified in § 121.583(a)(1) through (a)(7).
3. Prior to each flight, a flightcrew member must brief each supernumerary on the use of the exits and emergency equipment, including instructions to inspect the ground to determine whether a safe landing can be achieved before using an assist means.
4. The operator must determine that each supernumerary is physically able to accomplish the necessary emergency procedures.
5. Each supernumerary must be provided with a portable oxygen unit with a mask attached to it that he or she must carry whenever he or she is in the Class E cargo compartment. The portable oxygen units may be located in a common area. The supernumeraries must be trained in the use of these oxygen units. Additionally, the oxygen units must be sized adequately for continuous and uninterrupted use during worst-case flight duration following decompression.
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.
7. For the exits designated for supernumerary use, eight descent devices (commonly known as inertia reels) and eight harnesses for use with the descent devices, available for the supernumeraries to use, must be provided.
8. An automatically activated aural decompression signal must be present and immediately recognizable in accessible areas of the Class E cargo compartment to notify supernumeraries when to don oxygen masks. No signal is required in accessible areas in the Class E cargo compartment if an airplane flight manual limitation is established

prohibiting supernumeraries from being in the Class E cargo compartment during flight. The pre-flight briefing must include training in the sound of the signal, the meaning of the signal, and the response to the signal (i.e., procedures for donning the masks and activating the flow of oxygen).

9. A flightcrew operated aural or visual annunciation, 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 signals the supernumeraries to return to their seats at the onset of turbulence and prior to landing. The pre-flight briefing must explain this annunciation to the supernumeraries. This briefing, annunciation, 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.
10. A flightcrew operated aural or visual annunciation, which is recognized in the Class E cargo compartment, must be installed. This aural or visual annunciation 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 signals the supernumeraries to return to their seats and secure the smoke barrier. The pre-flight briefing must explain this annunciation to the supernumeraries. This briefing, annunciation, 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.
11. A placard must indicate that the smoke barrier must be secured (i.e., the door or curtain must be closed) when the Class E cargo compartment is not occupied. The placard must

be located in a conspicuous place in the flightdeck, either on or next to the smoke barrier. The pre-flight briefing must inform supernumeraries of this requirement and whether or not they may enter the Class E cargo compartment.

Issued in Renton, Washington, on July 19, 2005.

/S/

Ali Bahrami
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