

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

In the matter of the petition of

The Boeing Company

for an exemption from §§ 25.785(d),
25.807(c)(1), 25.857(e), and
25.1447(c)(1) of Title 14, Code of Federal
regulations

Regulatory Docket No. 29282

PARTIAL GRANT OF EXEMPTION

By letter dated June 11, 1998, and facsimile dated December 2, 1998, Mr. Kevin Hull, Manager, Airplane Certification, Douglas Products Division, The Boeing Company, 3855 Lakewood Blvd., Long Beach, CA 90846-0001, petitioned for exemption from the requirements of §§ 25.785(d), 25.807(c)(1), 25.857(e), and 25.1447(c)(1) of Title 14, Code of Federal Regulations. The proposed exemption, if granted, would permit the accommodation of up to four supernumeraries immediately aft of the cockpit on MD-10 freighter airplanes equipped with a Class E cargo compartment.

The petitioner requests relief from the following regulations:

Section 25.785(d), as amended by Amendment 25-20, requires, in pertinent part, that there be a firm handhold to enable occupants to steady themselves while using the aisles in moderately rough air.

Section 25.807(c)(1), as amended by Amendment 25-15, requires, in pertinent part, that a minimum of one Type IV emergency exit be installed in each side of the fuselage for passenger seating configurations of one through ten.

Section 25.857(e), as adopted in part 25, defines the attributes of a Class E cargo compartment, and requires that a Class E cargo compartment may not be on any aircraft other than one utilized exclusively for the carriage of cargo (i.e., occupants other than flightcrew not permitted).

Section 25.1447(c)(1), as adopted in part 25, requires, in pertinent part, that oxygen masks must be immediately available to each seated occupant, be automatically deployed, and must exceed in number the quantity of seats by a minimum of ten percent, with the extra units distributed evenly throughout the cabin.

Related Sections of the Federal Aviation Regulations (FAR):

Title 14, Code of Federal Regulations § 121.583(a) contains, in pertinent part, a listing of categories of the occupants who may be carried aboard an airplane in part 121 service without complying with all the passenger-carrying airplane requirements of part 121.

Title 14, Code of Federal Regulations § 121.583(c) requires that supernumerary occupants receive oral briefings on pertinent emergency equipment prior to each takeoff.

Subpart N of part 121 provides the training requirements for crewmembers.

The petitioner's supportive information is as follows:

McDonnell Douglas Corporation (MDC) hereby petitions for exemption from the requirements of §§ 25.785(d), 25.807(c)(1), 25.857(e), and 25.1447(c)(1) for MDC Model MD-10 airplanes operating with either of the following two Class E cargo compartment configurations:

To allow accommodations for up to four supernumeraries in a “courier area” aft of the cockpit door and forward of a rigid cargo barrier, or;

To allow accommodations for up to two supernumeraries in a “courier module” area aft of the cockpit door and forward of a 9g crash net.

“Nature of extent of relief sought:”

“Section 25.785(d): No hand hold is installed.

“Section 25.807(c)(1): Relief is sought to show that an equivalent or greater level of safety is provided by the two oversized Type I exits provided in the forward portion of the main deck of the MD-10 Freighter Airplane.

“Section 25.857(e): Relief is sought to permit accommodations for up to four persons during taxi, takeoff, flight and landing, in the Class E cargo compartment on an all-freighter airplane.

“Section 25.1447(c)(1): One oxygen dispensing unit is supplied and readily available for every seated occupant in the supernumeraries’ seats. The occupants will take hold of the mask upon instruction via lighted signs and chimes. These signs and chimes are either automatically activated by an altitude-sensing aneroid switch or can be activated manually by the cockpit crew.”

“Information provided in support of petition:

“The MDC MD-10-10F/-30F is a pressurized, transport category airplane powered by three turbofan engines. It will be included on Type Certificate Data Sheet (TCDS) No. A22WE, which was issued for the first DC-10 freighter aircraft on March 30, 1973. The freighter airplane affected by this exemption will have a Class E main-deck cargo configuration.

In order to optimize cargo missions, a “courier area” accommodating four persons or a “courier module” accommodating two persons is provided between the flight-deck and the main-deck Class E compartment, in the direct vicinity of the exits. Except for the sections from which exemption is requested, all design criteria applicable to the carriage of passengers have been taken into account during the design of these accommodations. In particular, protection from crash injury and from the penetration of smoke and noxious gases is provided by a rigid cargo barrier with a smoke-tight curtain in the one configuration, or a 9g crash net with the smoke curtain in the other configuration, which isolates the main-deck cargo compartment from the zone where the supernumerary persons are seated. “Two emergency exits are provided, one on each side of the fuselage, each equipped with slide/rafts. The supernumerary oxygen supply is from the same distribution supplied to the flight deck. There are two 115 cu. ft. supply cylinders located beneath the cockpit floor. There are no means to separate the supernumeraries from the flight deck crewmembers. If a shutoff valve is installed, it is only for use by maintenance personnel to isolate a leak. This design is the same as our approved production MD-11 freighters with courier stations installed. The occupants are notified that oxygen masks need to be used by a continuous chime and lighted signs located in their direct eye scan. A press-to-test and reset button for the Don Oxygen light will be installed. Note: As an improvement to the notification system, the chime will be a continuous chime on all of our freighter designs. These warning features (chime and lighted signs) can be either manually activated by the flight crewmembers or automatically turned on by an altitude sensing switch. The masks are of the quick-donning, full-face type similar to the cockpit masks.

“Two-way communication with the cockpit is possible through dedicated communication panels, and other emergency equipment required by the applicable airworthiness standards is also provided.” MDC believes that an equivalent level of safety with the parts of the requirements from which relief is sought will be achieved by design precautions and by the introduction of instructions in the TCDS defining the conditions under which supernumerary persons may be carried (Ref. § 121.583(a)).

“Supporting arguments:”

Section 25.857(e): Cargo operators need for their missions a number of support personnel necessary for the safe handling of cargo in the process of loading/offloading. Such personnel are obviously needed both at departure and arrival of a cargo flight. It is particularly important that cargo handlers are present upon airplane arrival if perishable goods or live animals are carried. The most efficient, surest, and most cost-effective way to assure their attendance at destination airports is to transport them aboard the cargo flight. Among their various missions, cargo operators may have to carry goods such as live animals, hazardous materials, and 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. The rigid cargo barrier is designed with a sliding door and a viewing window on the right-hand side looking aft, to allow for crew members to have access to the cargo compartment. Safety and efficiency of the operation will therefore be enhanced.

“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 personnel aboard their cargo flights, thus saving travel by regular passenger flights.”

The airworthiness standards under which the affected airplanes were type certificated, as well as current airworthiness standards, address the carriage aboard commercial flights of only the following types of occupants:

“Crewmembers, including flight crewmembers and flight attendants, who are each assigned duties associated with the operation of the airplane, and;

“Passengers, who have no expected ability in the use of emergency provisions, and therefore need to be attended.

“The categories of occupants for which this exemption is sought are qualified aeronautical personnel. Furthermore, they are briefed in the autonomous use of emergency equipment and emergency exit operation. It will also be required that the operator allows access to these seats only to persons found able to perform these tasks on their own.”

“Section 25.785(d): The requirement to have handgrips installed when seat backs do not allow a firm handhold could not be met due to the forward cabin zone configuration. For

the proposed category of occupants, the recommendation to remain seated with seat belt fastened as far as practicable will be made in order to limit moving around to the necessary minimum.”

“Section 25.807(c)(1): The requirement for a minimum of a Type IV exit on each side of the fuselage is offset by the installation of an oversized Type I exit with slide/raft on each side of the fuselage.” Even if one of these exits should be blocked by shifting cargo, the remaining exit, during tests witnessed by FAA, has successfully allowed the evacuation of a minimum of 61 untrained test subjects during a 90-second time period. It is believed that since all persons will be knowledgeable personnel, and at least one oversized Type I exit and the right- and left-side cockpit windows would be available for evacuation, a level of safety greater than that required by § 25.807(c)(1) is provided.

“Section 25.1447(c)(1): The requirement for oxygen dispensing units to be automatically presented before cabin pressure altitude exceeds 15,000 ft. is compensated for by the users having knowledge of equipment location and use. The masks provided are quick-donning masks with regulator, and are immediately available to seated occupants in a similar manner as for flight crewmembers.” The additional requirement of § 25.1447(c)(1) for a ten-percent excess quantity of dispensing units is mainly for cabin attendants moving along the aisles, and to accommodate infants held in laps. Neither of these situations applies to the proposed occupancy or configuration. However, we can provide additional dispensing units in some locations, as required.

“Actions to be taken by MDC to provide an equivalent level of safety:”

In order to insure compliance with the conditions provided in support to this exemption, MDC proposes to include in the pertinent TCDS the following limitations when operating in the Class E cargo mode:

“1. Occupancy is restricted to a maximum of four supernumerary persons when operating with the rigid cargo barrier configuration, or;

“Occupancy is restricted to a maximum of two supernumerary persons when operating with the 9g crash net configuration.

“2. Occupants are limited to the categories specified in § 121.583(a)(1) through (7).

“3. The operator must determine that each occupant has the demonstrated physical ability to autonomously use the emergency provisions.

“4. Each occupant must be instructed by the operator in accordance with FAA-approved procedures on the autonomous use of the emergency provisions, and orally briefed before each takeoff by an appropriate crew member as to the location and use of the emergency exits and emergency equipment.”

Reasons why granting an exemption is in the public interest:

Granting of exemption would be in the public interest, since by carrying supernumerary persons aboard their cargo flights, U.S. operators of the affected airplanes will be able to operate under optimal safety conditions, render their operations more efficient, improve the utility of cargo airplanes, and make substantial savings in carrying their personnel from one destination to another.

A summary of Boeing’s petition was published in the Federal Register on December 16, 1998 (63 FR 69356). No comments were received.

The FAA's analysis/summary is as follows:

Section 121.583: This section recognizes a “person” category of occupant, as distinct from “passenger” or “crew” occupants addressed in 14 CFR part 25. Section 121.583 allows non-compliance, for operational purposes only, with certain part 121 requirements normally pertinent to passenger-carrying airplanes, passenger-carrying operations, and passenger requirements. These “persons” are commonly referred to as supernumeraries. Supernumeraries are a special class of occupant, by virtue of certain knowledge and abilities attributed to them through selection and mandatory training. The resulting enhanced capabilities of supernumeraries, over that which can be expected of passengers, allows exemption in certain instances from selected type design requirements that are normally imposed for the safety of ordinary passengers. In all cases, however, the desired end result is the retention of all passenger safety features to the maximum extent reasonable, when all factors are considered, and an overall level of safety for supernumeraries that is comparable to that afforded to passengers.

Part 25 does not address “persons.” Therefore, regardless of any part 121 provisions affecting operations, in order to modify part 25 transport category airplanes by installing supernumerary accommodations that do not comply with part 25 certification requirements for passengers, it is first necessary to petition for and obtain exemption from the affected part 25 requirements. To date, the FAA has processed, generally favorably, a number of petitions for exemption associated with the installation of supernumerary

accommodations, provided there was a public interest in doing so, and certain conditions were met to assure an adequate level of safety. Those conditions have varied, depending on the airplane design, the nature of the proposals under consideration, and the number of persons involved. In most instances, these petitions have addressed accommodations for only a few supernumeraries, located immediately aft of the flight deck, which is a scenario reasonably consistent with that thought to be envisioned during the promulgation of § 121.583.

This petitioner has proposed two different supernumerary accommodation configurations, one of which accommodates up to two supernumeraries, and the other up to four supernumeraries, in the area immediately aft of the cockpit and forward of the smoke barrier and cargo retention means. Generally, configurations such as these have some considerable precedent.

In reviewing the petition, the FAA notes the petitioner's statement that, "...all design criteria applicable to the carriage of passengers *have been taken into account...*" (emphasis added). The FAA considers this statement to be somewhat less definitive than one declaring compliance with all pertinent sections of 14 CFR pertaining to accommodations for passengers. Accordingly, this partial grant of exemption shall be understood to address only the specific sections from which exemption is sought, and necessarily assumes that all other pertinent passenger safety requirements of part 25 have been complied with to the satisfaction of the FAA's cognizant Aircraft Certification Office (ACO).

Section 25.785(d): The requirement of § 25.785(d) for handholds is to assure 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, the occupied area is very small, with no aisles and nowhere to go, and it is possible to return to each seat very quickly. Therefore, the FAA concurs with the petitioner that it is not necessary to provide dedicated handholds beyond those that may be already incidentally available. Accordingly, the petition in this regard is granted.

Section 25.807(c)(1): The pertinent requirements of § 25.807(c)(1) are to assure a certain number of minimally sized emergency exits on each side of the fuselage for the intended occupancy. For the occupancy proposed by the petitioner, a minimum of a Type IV exit on each side is required. The petitioner is actually providing oversized Type I exits, however, which far exceed those minimum requirements. A petition for exemption from those requirements is therefore unnecessary. The FAA notes as commendable the petitioner's retention of existing escape slide/rafts as the required assist means at those exits, and considers their retention an integral part of the petitioner's proposal.

Section 25.857(e): The requirements of § 25.857(e) permit the carriage of only cargo when a Class E cargo compartment is installed on an airplane. Class E cargo compartments are separate from the flight deck, and generally encompass the entire remaining interior of the airplane. One major concern in permitting occupancy by non-crewmembers outside the flight deck on such airplanes is in assuring that there is a suitable means for preventing smoke penetration into this occupied area. Another concern is that the persons allowed on board the airplane are limited to those who are briefed on emergency equipment and procedures, and are found by the operator to be both physically fit and willing to use the emergency equipment and means of emergency egress provided. The petitioner appears to satisfy these concerns by providing a smoke curtain, and by acknowledging that certain limitations on the occupants is appropriate. These limitations are considered to be already adequately addressed in part 121, with regard to occupant qualifications and training.

The design requirements for airplanes with a Class E cargo compartment installed is predicated upon implementation of the cabin decompression procedures required by § 25.857(e)(3) to control a fire until a landing can be effected. Accordingly, MD-10 Airplane Flight Manual (AFM) procedures which require raising the cabin altitude to 25,000 feet when above 27,000 feet, and establishing a cabin differential pressure of 0.5 psi when below 27,000 feet, remain applicable, and shall be a condition of this exemption. Additionally in that regard, as a condition of this exemption, substantiation shall be provided to the satisfaction of the FAA that sufficient supplemental oxygen is available for all intended occupants at those cabin altitudes, for the maximum anticipated flight durations under those conditions.

Exemption is conditionally granted from the requirement of § 25.857(e) which would otherwise preclude the installation of accommodations for occupants in an airplane in which a Class E cargo compartment is installed, for a maximum of four supernumerary occupants in the accommodations proposed, in an area immediately aft of the cockpit and forward of the cargo retention device and smoke barrier as proposed. These conditions are discussed herein.

Section 25.1445(a): Although the petitioner has not requested exemption from the requirements of § 25.1445(a), nor is one granted herein, it is noted that the petitioner nevertheless superfluously describes a distribution system for supplemental oxygen which provides a common supply for all occupants, with no means proposed to separate the supply between the flight crewmembers and the supernumerary occupants. Given that the intent of the noted requirements is to ensure that an adequate supply of oxygen is prioritized for flight crewmembers, there is an appearance that this proposal may violate

those requirements. Accordingly, irrespective of any previous acceptance by the FAA, as the petitioner states, the petitioner shall, as a condition of this exemption, substantiate to the satisfaction of the FAA that compliance with these requirements has been shown for these airplanes.

Section 25.1447(c)(1): Exemption from the requirements of § 25.1447(c)(1) for the automatic presentation of masks is conditioned upon the FAA's determination that the proposed audible and visual means of notifying supernumerary occupants are adequate under all ambient noise and lighting conditions likely to be encountered. The FAA notes that the petitioner describes including an "either/or" capability for automatically, via an aneroid switch, or manually notifying of the need to don oxygen masks. The FAA wishes to clarify that a grant of exemption is made from the requirement of § 25.1447(c)(1) with regard to the automatic presentation of *masks*, but only on the condition that automatic *notification* shall be provided, with a manual backup. Exemption is also granted from the requirements of § 25.1447(c)(1) with regard to the uniform distribution of excess masks.

In providing rationales to justify the accommodation of supernumeraries, the petitioner has advanced some arguments which suggest that there is an expectation that these supernumeraries would and could have access to the Class E cargo compartment during taxi, takeoff, flight, and/or landing. Given that there are no regulatory requirements which address this scenario, however, and since the petitioner has not proposed any means of addressing the safety of occupants in this compartment during flight operations, entry into the Class E compartment during taxi, takeoff, flight, and landing shall necessarily be prohibited. Accordingly, it shall be a condition of this grant that any entry point from the supernumeraries' accommodation area to the Class E cargo compartment be placarded to this effect.

Section 11.25(b)(5): Relative to the requirements of § 11.25(b)(5) that a petitioner advance arguments why granting the petition would be in the public interest, the FAA generally expects to be presented with statements as to how the public would benefit from the grant of exemption. This petitioner, however, cited the various advantages of being permitted to accommodate supernumeraries in terms of financial benefit to the operator. In short, it appears that the petitioner's focus is on profitability, and not on reduced cost for the public. Nevertheless, the FAA expects that any increased profitability will, due to market and competitive pressures, result in lower costs and other advantages to the consumer--which is in the public interest.

Title 49 part 175: Finally, attention is drawn to the petitioner's statements that hazardous cargo cannot be left unattended, as one justification for permitting supernumeraries onboard such flights. Without making any determinations as to the accuracy of this claim, the FAA advises in this regard that the carriage of hazardous cargo is governed by the operational and security requirements of 49 CFR part 175. Accordingly, and in view of the fact that the proposed supernumeraries are not being accommodated in the same

compartment as any hazardous cargo, the FAA's Transport Airplane Directorate (TAD) makes no determination with regard to the acceptability of carrying supernumeraries on flights with hazardous cargo also onboard. The TAD does, however, as a reasonable precaution, recommend that the potential for exposure to hazardous materials be minimized to the maximum extent practicable, by reducing supernumerary occupancies on such flights to the minimum number absolutely required for safety of flight.

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest and will not significantly affect the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), The Boeing Company is hereby granted an exemption from the requirements of §§ 25.785(d), 25.857(e), and 25.1447(c)(1). The petition is granted to the extent required to permit type certification of the MD-10 freighter airplane with a Class E cargo compartment, with accommodations for either (1) up to four supernumeraries in one configuration or (2) up to two supernumeraries in another configuration, to have either configuration immediately aft of the cockpit as proposed, and to have the airplane equipped as proposed with two floor-level emergency exits with escape slide/rafts within the immediate vicinity of the occupied area, except as defined in the several conditions discussed above in the FAA's analysis/summary section.

Issued in Renton, Washington, on March 23, 1999

/s/

John J. Hickey
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM 100