Exemption No. 6598

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

In the matter of the petition of **Boeing Commercial Airplane Group** for an exemption from §§ 25.562 and 25.785(b) of the Federal Aviation Regulations	**Regulatory Docket No. 28720**

GRANT OF EXEMPTION

By letter B-T113-96-3254 dated October 14, 1996, K. B. Buchanan, Manager, Certification Delivery and Fleet Support Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, WA 98124-2207, petitioned for an exemption from §§ 25.561, 25.562 and 25.785(b) of the Federal Aviation Regulations (FAR) to the extent necessary to permit certification of medical stretchers for transport of persons whose medical condition dictates such accommodation. The exemption is for Boeing Model 777 series airplanes.

Section of the FAR affected:

Section 25.785(b) (Section 25.785(a) at Amendment 25-64) requires that each seat, berth, safety belt, harness, and adjacent part of the airplane at each station designated as occupiable during takeoff and landing must be designed so that a person making proper use of those facilities will not suffer serious injury in an emergency landing as a result of inertia forces specified in §§ 25.561 and 25.562.

Section 25.561 specifies the emergency landing static load conditions for structural retention.

Section 25.562 specifies dynamic test conditions for qualification of occupant injury criteria, as well as structural retention criteria.

The petitioner's supportive information is as follows:

"Nature of extent of relief sought:

"For only stowable hospital berth installations for non-ambulatory occupants, Boeing petitions for exemption from FAR 25.785 (b) and FAR 25.562 in its entirety, for all injury and structural criteria.

"Description of each aircraft covered:

"Boeing Model 777-200 and 777-300.

"Information provided in support of petition:

"The purpose of the stowable hospital berth is to transport non-ambulatory individuals who can not travel, for medical reasons, in a normal passenger seat. In most cases these individuals will be transported for the purpose of receiving needed medical attention.

"The stowable hospital berth is not basic to any Boeing airplane design. When installed, it will be limited to a single installation per aircraft and will not be used every flight. When the berth is occupied, it will not reduce safety or limit the level of protection provided to the other occupants of the aircraft.

"The berth in its stowed configuration will fold into a stowage unit located directly aft of the two rows of seat assemblies over which it attaches to in its deployed configuration. The stowage unit and the two seat rows which make up the berth system will be located in the aft portion of the airplane. There will be no passenger seats or attendant seats immediately aft of the berth. This location precludes the possibility of the berth creating a Head Injury Criteria (HIC) or impact safety issue to other occupants of the aircraft. The non-ambulatory occupant of the berth will be oriented head forward in the berth.

"The basic premise for the implementation of FAR 25.562 was to provide an overall increased level of passenger safety by reducing serious injuries which would affect the passengers ability to evacuate the aircraft in a survivable accident. The FAA has evaluated the manufacturing and operational costs associated with installing dynamically tested seats and has determined that the benefits of the increased level of safety is significantly greater than these costs. While this conclusion may be valid for passenger seats which can number up to 440 per aircraft, it is not necessarily valid for berth installations which, in this case, will only number one installation per aircraft.

"The FAA and industry has invested sizable resources in research and development in defining FAR 25.562 for the standard passenger, flight deck, and flight attendant seats. None of this research and development addresses the uniqueness of a stowable hospital berth configuration, hence the rule and associated advisory circular (AC) should not be considered applicable. The design and testing costs associated with the certification of a berth installation will be equal to, if not exceed, those of a typical passenger seat installation. The market over which these costs can be spread is so limited that it will drive the unit cost of a berth to a point which will make its installation impractical. The effort involved in producing passenger seat installations that comply with FAR 25.562 benefits the vast majority of passengers on an aircraft. The berth installation, although being used infrequently and only by one passenger, will require an equal or greater level of effort as that associated with a passenger seat installation certification; however, it will yield little or no increase in overall passenger safety.

"The type of injuries that are to be minimized in frequency and severity with the adoption of FAR 25.562 are typically incurred by seated passengers. The subsequent injury criteria that is to be complied with as defined in FAR 25.562 and Advisory Circular 25.562-1A were developed to minimize HIC values, lumbar loading, femur loading, and torso compression. All of these injuries are consistent with seated individuals utilizing upper torso straps (shoulder harnesses) and/or lap belts when subjected to extreme forward and down loading. The occupant of a berth will be in a supine position and will not be subjected to the specific load paths defined for seated passengers. Enhancing. the survivability of the berth occupant through compliance with FAR 25.562 is questionable since these injury criteria were developed for seated occupants coming into contact with adjacent seat rows or fixed bulkheads. Therefore, the appropriate injury criteria for a non-ambulatory passenger occupying the berth does not exist.

"This berth is not independently attached to the airframe structure when in the deployed position. The deployed berth lays across the broken over seat backs of the two double economy seat rows just forward of its stowage enclosure. These seats will be certified to FAR 25.562 independently of the berth with normally seated occupants. The berth attaches to the structural frames in the bases of the two seats and utilizes them as its support structure. Therefore, all loads, both static and dynamic, generated from the berth will be subsequently transmitted through these seats. The berth/seat system will fully comply with the static load requirements defined in FAR 25.561.

"FAR 25.562 states that deformation shall not occur to the extent that it would impede rapid evacuation of the airplane occupants. It is considered that the deformation limits of the seat assemblies supporting the berth will be less than those experienced during the dynamic testing of the seats for TSO C127 approval. This belief is based on the fact that the berth is supported by two seat assemblies, each containing two seat places for a total load of (4) four 170 lb. passengers while the berth will only impose the weight of

one 170 lb. passenger plus the weight of the berth itself, which will be less than the weight of a second individual.

"It should be noted that the in-service use of this unit will be extremely limited since it is designed and intended for use by non-ambulatory passengers only. When deployed the berth will displace four revenue seating positions. There are no specific restrictions for its usage, but the frequency of its use by the airline will be limited by the very nature of its intended use.

"Reasons why granting an exemption is in the public's interest and will not adversely affect public safety:

"Granting the exemption will allow the 777 airplane to be configured to provide affordable transport of non-ambulatory individuals to locations with needed medical facilities. By not granting the exemption, affordable transport of such individuals aboard scheduled 777 commercial flights will be denied. An available alternative would be to charter a private air ambulance. However, the vast majority of the public cannot afford this and thus, without the grant of exemption, access to needed medical facilities may not be readily available.

"Granting the exemption will not reduce safety or limit the level of protection afforded by FARs 25.785(b) and 25.562 to ambulatory passengers or crew."

A summary of the petitioner's October 14, 1996, petition was published in the Federal Register on November 13, 1996. No comments were received.

The Federal Aviation Administration's analysis/summary is as follows:

The FAA agrees that stretchers for medical use were not considered in the context of the dynamic test requirements of § 25.562 when the regulation was developed. Occupancy of other berths during takeoff and landing for ambulatory persons was not considered feasible under the conditions of § 25.562; and for the purposes of compliance, stretchers are considered "berths."

The FAA agrees that demonstrating compliance with the requirements of § 25.562 would be very difficult, and applicability of the existing pass/fail criteria to these installations is questionable.

The FAA has also considered the cost implications and the overall benefits resulting from usage of the stretchers. If a person is forced to charter an airplane, when carriage by commercial carrier would have otherwise been acceptable, it is possible that the resultant cost would be prohibitive, and the necessary medical attention will not be

available. Certainly, any safety benefit from averting the possible consequences of a stretcher not meeting the dynamic test requirements is moot in this case.

The FAA has also considered that the use of stretcher is limited, and on a case by case basis. The exposure to the possibility of an accident on any given flight is therefore less than for airplanes in general. Since use of the stretcher for takeoff and landing is limited only to those persons whose medical condition dictates travel in that manner, the FAA does not consider this a precedent setting finding.

With respect to the overall level of safety, the FAA notes that full compliance with the requirements of § 25.561 will be demonstrated for the stretcher. In addition, the stretcher will be attached to seats that full comply with § 25.562, so that the retention of the stretcher itself is provided. Therefore, the primary effect of the exemption is to alleviate compliance with the injury criteria for the occupant of the stretcher itself.

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest, and will not significantly affect the overall level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 USC 40113 and 44701, formerly §§ 313(a) and 601(c) of the Federal Aviation Act of 1958 as amended, delegated to me by the Administrator (14 CFR 11.53), the petition of Boeing Commercial Airplane Group for exemption to the requirements of §§ 25.562, and 25.785(b) of the FAR, for installation of stretchers is hereby granted, with the following provision:

Occupancy for takeoff and landing is limited to non-ambulatory persons. Suitable means to identify this limitation shall be provided as part of the stretcher type design.

Issued in Renton, Washington, on March 28, 1997

Stewart R. Miller
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM-100\