Exemption No. 6887

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

In the matter of the petition of

Ilyushin Aviation Complex

for exemption from § 25.562(b)(2), of Title 14, Code of Federal Regulations

Regulatory Docket No. 29383

PARTIAL GRANT OF EXEMPTION

By letter dated October 30, 1998, Mr. Yuri Ostrovsky, Interstate Aviation Committee Aviation Register, Russian Federation, Bolshaya Ordynka, 22/2/1, Moscow, 109017, Russia, on behalf of the Ilyushin Aviation Complex, transmitted by facsimile a petition for exemption from the floor warpage test requirements of § 25.562(b)(2) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would be for all seats on the Ilyushin Model 96T freighter aircraft.

The petitioner requests relief from the following regulations:

> Section 25.562(b)(2), in prescribing the conditions under which seats must be tested, requires in pertinent part that where floor rails or floor fittings are used to attach the seating devices to the test fixture, the rails or fittings must be misaligned with respect to the adjacent set of rails or fittings by at least ten degrees vertically (i.e., out of parallel) with one rolled ten degrees.

ANM-98-060-E

Related sections of the Federal Aviation Regulations (FAR):

Section 25.785(b) requires that each seat, 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 the inertia forces specified in §§ 25.561 and 25.562.

The petitioner's supportive information is as follows:

"1. The transport category IL-96T is a widebody cargo airplane which seats crewmembers only. There will be two pilot seats and two observers seats in the flight deck and three seats for an attendant and the second-shift flight crew in the extra crew cabin (behind the cockpit). The IL-96T is the first airplane in Russia that will be certified to the US Federal Aviation Regulations FAR 25. Also, it will be for the first time that all types of seats installed on the flight deck and extra crew cabin will have to meet the requirements of FAR 25.562. The compliance with FAR 25.562 will be demonstrated by evaluation of the results of dynamic seat testing and additional analysis of the airplane structure and cabin interior design. There are some provisions in FAR 25.562, however, which will complicate the conducting of dynamic seat testing and therefore result in increased costs of the test and the cost of the IL-96T airplane with no commensurate increase in safety.

"2. Specifically, Section 25.562(b)(2) requires that '…Where floor rails or floor fittings are used to attach the seating devices to the test fixture, the rails or fittings must be misaligned with respect to the adjacent set of rails or fittings by at least 10 degrees vertically (i.e., out of parallel) with one rolled 10 degrees.' The simulated floor deformation in dynamic testing shall demonstrate the tolerance of the seat and its attachments to the floor warpage that can occur in actual survivable crash conditions. This requirement, though based on the analysis of passenger seats mainly, is now applied to both crew and passenger seats. Considering the traditional differences in the structure and attachments of crew and passenger seats, one can readily assume that floor warpage will not be a critical factor for crew seats. In particular, installed in the IL-96T flight deck are the pilot seats manufactured by SOGERMA-SOCEA (France) . . . which are rigid enough to withstand maximum pilot control forces. The single piece . . . ensures a rigid connection of the seat base with the main load bearing floor structure, and will be quite insensitive to probable floor structure distortion in crash conditions.

"3. Also, FAR 25.562(b)(2) does not consider the peculiarities of the structure and arrangement of a widebody cargo airplane. For example, only the restricted

number of occupants are allowed to be on-board the IL-96T in flight: from two (minimum) to eight (maximum) crewmembers and they will seat in a specific location. Thus, the IL-96T pilot seats are installed at the ST. 3-4 area where the distance from the floor level to the fuselage lowest point is 55 in. (1400mm). The first observer seat is located at the ST-7-8 area with this distance of about 75 in (1900mm). The second observer seat, the attendant seat and extra crew seats are all located at areas where this distance approximates 82 in. (2100mm). Hence, the fuselage structure below the common floor of the flight deck and extra crew cabin is more than 40 in. (1016mm) in height that we consider quite adequate to absorb the ground impact energy of the IL-96T in an actual crash. Due to the plastic deformation of the lower fuselage primary structure there are expected to be no essential floor distortions and no extra loading of the seats and their attachments to the cabin floor.

"4. Considering the foregoing, ILYUSHIN petitions for Exemption from the IL-96T Certification Basis from the floor warpage simulation requirement of FAR 25.562(b)(2) (Amendment 25-64) regarding pre-test seat attachment deformations in dynamic testing of all types of seats in stalled in this airplane."

A summary of the petition was published in the Federal Register on November 30, 1998 (63 FR 65862). No comments were received.

The FAA's analysis/summary is as follows:

Subsequent to the adoption of this requirement by Amendment 25-64, it was determined that, although some cockpit floor distortions have occurred during accidents, there has not been a problem with flight deck seat separations due to floor buckling on "narrow body" and larger airplanes having at least 40 inches of frangible structure between the flight deck floor and the extended lower fuselage contour. Consequently, the FAA has concluded that requiring the testing of flight deck seats under conditions of floor warpage cannot be justified on airplanes of this minimum size. The FAA is currently working toward amending § 25.562(b)(2) in this regard.

The FAA notes that since the petition was filed, Ilyushin has elected to use a different seat than the one referenced in the petition. The choice of seat suppliers does not affect the FAA's decision in this matter.

In this petition Ilyushin has also requested relief from this section for seats that are outside the flight deck, that will be used by relief and other crew. The FAA does not consider that an exemption is warranted for seats outside the flight deck. Service history has shown that seat separation as result of distortion between the seat and its attachment to the floor has occurred outside the flight deck, and can and should be addressed in certification testing. The petitioner's comments regarding the types of occupants of these seats are not really relevant to this petition, since all occupants should be provided the same level of safety. Therefore, the petition with respect to seats outside the flight deck is denied.

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest, and is determined not to have an adverse effect on 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 portion of Ilyushin Aviation Complex petition for exemption from the floor warpage test requirements of § 25.562(b)(2) for flight deck seating, is granted.

With regard to the portion of the petition for exemption for seats outside the flight deck, I find that a grant of exemption is not in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), that portion of the petition is hereby denied.

Issued in Renton, Washington, on April 13, 1999.

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