

Background

On December 19, 2001, the Boeing Commercial Airplane Group (BCAG), P.O. Box 3707, Seattle, Washington 98124, applied for a change to Type Certificate No. T00001SE for a design change to install an overhead flight crew rest (OFCR) and an overhead flight attendant rest (OFAR) in the Boeing Model 777 series airplanes. The Boeing Model 777 series airplanes are large twin engine airplanes with various passenger capacities and ranges depending upon airplane configuration.

The OFCR compartment, adjacent to Door 1, is located in the overhead above the main passenger cabin and will include a maximum of two private berths and two seats. Occupancy of the OFCR will be limited to a maximum of four occupants. Several different OFAR compartments are being proposed under this design change. The OFAR adjacent to Door 3 will have berths for a maximum of seven occupants. The OFAR adjacent to Door 5 will have three compartment options available, with berths for a maximum of six, eight or ten occupants.

Both crew rests, the OFCR and OFAR, will be accessed from the main deck by stairs. In addition, an emergency hatch that opens directly into the main passenger cabin area will be provided for each compartment. A smoke detection system, an oxygen system, and occupant amenities will also be provided. These compartments will only be occupied in flight, not during taxi, takeoff, or landing.

Crew rest compartments have been previously installed and certified in the main passenger cabin area, above the main passenger area, and below the passenger cabin area adjacent to the cargo compartment of the Boeing Model 777 series airplanes. Also, overhead crew rest compartments have been installed on the Boeing Model 747 series airplanes.

The FAA has previously issued special conditions that contain the additional safety standards that must be met for the overhead crew rest compartments on Boeing Model 747 series airplanes. The FAA certified the lower lobe flight attendant rest compartment on the Boeing Model 777 series airplanes by an equivalent level of safety finding to the requirements of § 25.819. In addition, the FAA recently issued Special Conditions No. 25-169-SC, dated December 1, 2000, amended on May 2, 2001, for Boeing Model 777 series airplanes for overhead crew rest compartments for Flight Structures Inc. of Arlington, Washington. The FAA also issued Special Conditions No. 25-192-

SC, dated November 6, 2001, for Model 777 series airplanes for overhead crew rest compartments for the Boeing Commercial Airplane Group—Wichita Division Designated Alteration Station (DAS) of Wichita, Kansas.

Type Certification Basis

Under the provisions of § 21.101, Amendment 21-69, effective September 16, 1991, Boeing Commercial Airplane Group must show that the Model 777 series airplanes, as changed, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate Data Sheet No. T00001SE or the applicable regulations in effect on the date of application for the change. Subsequent changes have been made to § 21.101 as part of Amendment 21-77, but those changes do not become effective until June 10, 2003. The regulations incorporated by reference in the type certificate are commonly referred to as the "original type certification basis." The regulations incorporated by reference in Type Certificate No. T00001SE for the Boeing Model 777 series airplanes include 14 CFR part 25, as amended by Amendments 25-1 through 25-82. The U.S. type certification basis for the Boeing Model 777 series airplanes is established in accordance with 14 CFR 21.17 and 21.29 and the type certification application date. The type certification basis is listed in Type Certificate Data Sheet No. T00001SE.

If the Administrator finds that the applicable airworthiness regulations (*i.e.*, 14 CFR part 25) do not contain adequate or appropriate safety standards for the Boeing Model 777 series airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Boeing Model 777 series airplanes must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36.

Special conditions as defined in § 11.19, are issued in accordance with § 11.38 and become part of the type certification basis in accordance with § 21.101(b)(2), Amendment 21-69, effective September 16, 1991.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design features, or should any other model already included on the same

type certificate be modified to incorporate the same novel or unusual design features, the special conditions would also apply to the other model under the provisions of § 21.101(a)(1), Amendment 21-69, effective September 16, 1991.

Compliance with these special conditions does not relieve the applicant from the existing airplane certification basis requirements. One particular area of concern is that the overhead crew rest compartment installation creates a smaller compartment volume within the overhead area of the airplane. The applicant must comply with the requirements of §§ 25.365(e), (f), and (g), for the overhead crew rest compartment, as well as any other airplane compartments whose decompression characteristics are affected by the installation of an overhead crew rest compartment. Compliance with § 25.831 must be demonstrated for all phases of flight where occupants will be present.

Novel or Unusual Design Features

While the installation of an overhead crew rest compartment is not a new concept for large transport category airplanes, each compartment design has unique features by virtue of its design, location, and use on the airplane. Previously, crew rest compartments have been installed and certified in the main passenger cabin area of the Boeing Model 777-200 and -300 series airplanes and the overhead area of the passenger compartment of the Model 777-200. Other crew rest compartments have been installed below the passenger cabin area adjacent to the cargo compartment. Similar overhead crew rest compartments have also been installed on the Boeing Model 747 series airplanes. The modification is evaluated with respect to the interior and assessed in accordance with the certification basis of the airplane. However, part 25 does not provide all of the requirements for crew rest compartments within the overhead area of the passenger compartment. Further, these special conditions do not negate the need to address other applicable part 25 regulations.

Due to the novel or unusual features associated with the installation of this overhead crew rest compartment, special conditions are considered necessary to provide a level of safety equal to that established by the airworthiness regulations incorporated by reference in the type certificate.

Operational Evaluations and Approval

These special conditions outline requirements for overhead crew rest