

[4910-13]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 25**

**[Docket No. NM428; Special Condition No. 25-417-SC]**

**Special Conditions:** Boeing 747-468, Installation of a Medical Lift.

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions.

**SUMMARY:** These special conditions are issued for the Boeing 747-468 airplane. This airplane, as modified by Jet Aviation, will have a novel or unusual design feature associated with the installation of a medical lift. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

**EFFECTIVE DATE:** March 22, 2011.

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**SUPPLEMENTARY INFORMATION:**

**Background**

On March 2, 2007, Jet Aviation Engineering Services L.P. (JAES), of Teterboro, New Jersey, applied for a supplemental type certificate for a reconfiguration of an aircraft interior in a 747-468. The Boeing Model 747-468 airplane is FAA approved under Type Certificate A20WE

as a large transport-category airplane that is limited to 660 passengers or fewer, depending on the interior configuration.

This modification includes the installation of a medical lift between the main deck and upper deck. The lift allows the transport of a single occupant between the decks during cruise or ramp operations. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature.

### **Type Certification Basis**

Under the provisions of Title 14, Code of Federal Regulations (14 CFR) 21.101, JAES must show that the 747-468, as changed, continues to meet the applicable provisions of the regulations incorporated by reference in Type Certificate A20WE, or of the applicable regulations in effect on the date of application for the change. 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 A20WE are as follows:

- Part 36, as amended by Amendments 36-1 through 36-15, and any later amendments in existence at the time of certification.
- Special Federal Aviation Regulation (SFAR) 27, as amended by Amendments 27-1 through 27-6 and any later amendments in existence at the time of type certification.
- Part 25, effective February 1, 1965, as amended by Amendments 25-1 through 25-59, and the part 25 section-number exceptions itemized in Type Certificate A20WE.

The following special conditions, exemptions, and equivalent safety findings, which are part of the Model 747-300 certification basis, are also part of the certification basis for the Model 747-400.

The special conditions include those enclosed with an FAA letter to The Boeing Company dated February 20, 1970, and the following:

1. Special Condition 4A, revised to apply to airplanes with the landing-gear load-evener system deleted, was recorded as an enclosure to an FAA letter to The Boeing Company dated May 12, 1971.
2. Special Condition No. 25-61-NW-1, for occupancy not to exceed 32 passengers on the upper deck of airplanes with a spiral staircase, was transmitted to The Boeing Company by FAA letter dated February 26, 1975.
3. Special Condition No. 25-71-NW-3, for occupancy not to exceed 45 passengers on the upper deck of airplanes with a straight-segmented stairway, was transmitted to The Boeing Company by FAA letter dated September 8, 1976.
4. Modification of Special Condition No. 25-71-NW-3, for occupancy not to exceed 110 passengers on the upper deck of airplanes with a straight-segmented stairway, was transmitted to The Boeing Company by FAA letter dated August 3, 1981.
5. Special Condition No. 25-77-NW-4, modification of the autopilot system to approve the airplane for use of the system under Category IIIb landing conditions, was transmitted to The Boeing Company by FAA letter dated July 8, 1977.
6. Special Condition No. 25-ANM-16, for use of an overhead crew-rest area, occupancy not to exceed ten crewmembers, was transmitted to The Boeing Company by FAA letter dated November 19, 1987. The FAA-approved procedures required for compliance with paragraph 13 of the special condition are located in Boeing Document D926U303, Appendix D.

7. Special Condition no. 25-ANM-24, applicable to flight-deck displays and propulsion-control systems, was provided to Boeing on December 22, 1988.
8. Special Condition No. 25-ANM-25, which established lightning- and radio-frequency-energy protection requirements, was provided to Boeing on December 22, 1988.

### Exemptions from Part 25

Exemption no. 1013A, dated December 24, 1969: Exemption from Section 25.471(b) to allow lateral displacement of the center of gravity from the airplane centerline.

The following optional requirements, which are part of the Model 747-300 certification basis, apply also to the 747-400:

**Table 1: Optional Requirements**

<b>Requirement</b>	<b>Section</b>
Ditching provisions	25.801
Ice-protection provisions	25.1419

The following equivalent-safety findings, previously made for earlier models under the provisions of § 21.21(b)(1), are also applicable to the Model 747-400:

**Table 2: Equivalent-Safety Findings**

<b>Requirement</b>	<b>Section</b>
Width of aisle	25.815
Pilot-compartment view	25.773
Use of 1-g stall speed (nonstructural items)	Several (747-400 only)
Use of 1-g stall speed (structural items)	Several (747-400 only)
Position-light distribution and intensities	25.1389(b)(3) (747-400 only)
Fire-detection system	25.1203 <sup>1</sup>
Pressure relief	25.1103(d) <sup>1</sup>

Requirement	Section
Emergency-locator transmitter (ELT)	25.1415(d)
Emergency-exit marking	25.811(f)

<sup>1</sup>Applies to RB211-524G/H series engine installations only.

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 747-468 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 747-468 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.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 21.101.

Special conditions are initially applicable to the model for which they are issued. Should the applicant apply for a supplemental type certificate to modify any other model included on the same type certificate to incorporate the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

### **Novel or Unusual Design Features**

The original aircraft configuration included a straight stairway between the main deck and upper deck at Fuselage Station 870. The stairway is relocated in the new configuration, and the existing stairway is replaced with an electrically powered medical lift using the opening in the upper deck formerly occupied by the stairs. When the lift is not in operation, the upper-deck opening is covered by floor panels. These floor panels are opened up prior to operation of the lift and form a protective fencing around the upper-deck opening.

The purpose of the medical lift is to move an occupant between the master lounge in the upper deck and the medical room on the lower deck.

The lift platform is driven by two redundant electrical motors, mounted to the rear wall, between the struts. A lifting gear-drive with shafts and gear boxes is powered on the front and rear of the lift platform. The spindles are supported at the lifting gear on the lower support structure and with a strut support on the upper deck. The lift platform is guided in lateral directions with the guiding rails mounted on the struts.

## **Discussion**

Due to the novel or unusual features associated with the installation of this medical lift, the following 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.

## **Discussion of Comments**

Notice of proposed special conditions no. 25-99-11-SC for the Boeing Model 747-468 airplane was published in the Federal Register on May 18, 2010 (75 FR 27662). No public comments were received and the special conditions are adopted as proposed.

After the public-comment deadline on June 17, 2010, the FAA added text referenced in Note 1 in Table 2, and added special conditions 14e and f, and additional text to special condition 15a. The FAA has determined that this additional information enhances, and does not compromise, safety; does not materially affect the intent of the special conditions upon which the public had opportunity to comment; and therefore does not warrant a second public-comment period.

## **Applicability**

As discussed above, these special conditions are applicable to the 747-468. Should JAES apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate A20WE, to incorporate the same novel or unusual design feature, the special conditions would apply to that model as well.

## **Conclusion**

This action affects only certain novel or unusual design features on one model of airplanes. It is not a rule of general applicability and it affects only the applicant who applied to the FAA for approval of these features on the airplane.

## **List of Subjects in 14 CFR Part 25**

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

## **The Special Conditions**

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type-certification basis for Boeing 747-468 airplanes modified by JAES.

1. A functional verification must be conducted to ensure the adequacy of the lift design features that are supposed to prevent injury to the lift occupant, lift operator, and lift observer.
2. The occupied lift must be designed to withstand the non-emergency load conditions imposed by the aircraft according to loads report SIE-327-301, revision D.

3. Occupancy or operation of the lift must not be permitted during taxi, takeoff, landing (TTL), or turbulent conditions.
4. The lift must be stowed for TTL. The stowed position requires the lift platform positioned at the main-deck level with the floor panels closed.
5. A portable oxygen bottle must be present in the lift and easily accessible to the occupant.
6. Occupancy of the lift must be limited to a single occupant secured in one of two possible configurations:
  - a. The occupant must be secured to a medical stretcher that is attached to the lift platform. The occupied stretcher must be designed to withstand the non-emergency load conditions defined in loads report SIE-327-301, revision D.
  - b. The occupant must be secured to a wheelchair that is attached to the lift platform.
7. Control panels must be located on both main and upper decks, connected with full duplex audio communications. On both operator control units, an emergency shut-off switch must be installed. In an emergency, this switch must immediately interrupt the main power supply to the motors. Lift operation must be stopped until the emergency shut-off switch is reset. As soon as one of the operators commands operation in a direction, the “Up” and “Down” option buttons must be disabled and the stop button enabled. Before one of the operators is able to change the lift-travel direction again, the lift must first be stopped.
8. Lift operation must require a trained operator at the main-deck control panel and a trained observer at the upper-deck control panel.

9. Sensors must be installed to detect the following conditions, and to prevent the start or continuation of lift travel if any conditions are not met:
  - a. Upper-deck seat, located on the left side of the aircraft and just forward of the master-bath bulkhead, is in its most forward, outboard position.
  - b. Upper-deck master-bedroom/lavatory port bulkhead is opened and secured.
  - c. Upper-deck shower door is closed and secured.
  - d. Upper-deck master-lavatory door is opened and secured.
  - e. Upper-deck floor panels are opened and configured to form the protective fencing.
  - f. Main-deck inboard doors are closed and secured. The doors must be lockable only from the outside of the lift. This ensures that the operator has control of this area and that nobody is located under the lift.
  - g. Aircraft seat-belt-fasten signs must not be illuminated.
10. Sensors must be installed to detect the following conditions during operation, and to prevent continued lift travel if any of these conditions occur:
  - a. Over-temperature of lift motors and/or power-frequency converter.
  - b. Presence of smoke at motors and in electrical-control cabinet.
  - c. Over-current at the lift motors.
  - d. Asynchronous operation of the spindles.
11. A built-in fire extinguisher must be installed in the motor and electrical-control cabinet. This fire extinguisher must be designed to discharge automatically upon the occurrence of a fire.

12. The lift must have the provision for manual operation in the event of a malfunction such as a loss of power to the lift and/or associated systems.
13. A separate battery backup system must provide lighting for the lift-control system, lift control/sensors, communication system, and lift lights for a minimum of 10 minutes in the event of loss of power to the lift and/or associated systems.
14. Lift placards must be installed near or adjacent the control panels identified in special condition 7. The placards must be stated as follows:
  - a. THIS LIFT IS APPROVED FOR MOVING ONLY A SINGLE OCCUPANT BETWEEN THE MAIN AND UPPER DECKS AND ONLY WHEN SECURED TO EITHER AN APPROVED MEDICAL STRETCHER OR WHEELCHAIR. NO OTHER USES OF THIS LIFT ARE APPROVED.
  - b. DO NOT OPERATE LIFT DURING TAXI, TAKEOFF, LANDING, OR TURBULENCE.
  - c. AN APPROVED MEDICAL STRETCHER OR WHEELCHAIR MUST BE PROPERLY SECURED TO THE LIFT PLATFORM BEFORE OPERATING THIS LIFT.
  - d. THE LIFT MUST BE STOWED FOR TAXI, TAKEOFF, AND LANDING. THE STOWED POSITION REQUIRES THE LIFT PLATFORM POSITIONED AT THE MAIN-DECK LEVEL WITH THE FLOOR PANELS CLOSED.
  - e. DURING MEDICAL-STRETCHER TRANSPORT, ALL PERSONNEL, MATERIEL, AND PATIENT EXTREMITIES MUST BE POSITIONED BETWEEN THE HEAD AND FOOT OF THE STRETCHER.
  - f. LIFT MAXIMUM CAPACITY: X LBS (X KG)

15. Lift operational-instruction placards must be installed near the control panels and must describe how to:

- a. Configure the lift for operation, including ensuring that the bottom of the lift is clear of personnel and materiel before lowering the lift from the upper deck.
- b. Operate the lift.
- c. Stow the lift for non-operation such as during TTL and turbulence.
- d. Operate the mechanical-override features in the event of a malfunction such as a loss of power to the lift and/or associated systems.

16. Training and related manuals must include:

- a. Limitations and procedures for normal lift operation.
- b. Backup and override procedure for evacuating the lift and returning it to TTL configuration.

17. Special conditions nos. 3, 4, and 14 must be documented in the Limitations section of the airplane flight manual.

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