SAE Aerospace
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AEROSPACE RECOMMENDED PRACTICE

ARP4769 | REV. A

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Crew Rest Container for Main Deck or Lower Deck

RATIONALE

ARP4769, Crew Rest Container for Main Deck or Lower Deck, was originally issued by SAE in 1994. When this document came up for five year review by AGE-2A in 1999, some minor discrepancies were noted resulting in a project to revise this ARP. After several months of research into current crew rest designs and airworthiness requirements, AGE-2A has concluded that there is no real need for an industry standard for this product. Existing crew rest container designs were developed to meet very specific regulatory requirements already clearly defined by the applicable regulatory agencies. Crew rest containers are also designed for use on specific aircraft types for specific operator requirements, preventing the potential for any interline use. Though none of the existing crew rest container designs make reference to ARP4769, AGE-2A does feel there is some information contained in this document which precludes its cancellation. Despite this, there is no anticipated need for this document so the committee recommends that it be placed in a noncurrent status.

NONCURRENT NOTICE

This specification has been declared "NONCURRENT" as of January 2007. It is recommended, therefore, that this document not be specified for new designs.

Each of these "NONCURRENT" documents is available from SAE.

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1. SCOPE:

This document provides information about regulations and gives recommendation for the design of ULD - type main deck and lower deck mobile crew rest containers to be transported in aircraft equipped with a Class II restraint system as defined by NAS 3610.

2. APPLICABLE DOCUMENTS:

2.1 NAS Standards:

Available from Aerospace Industries Association, 1250 Eye Street NW, Washington, DC 20005.

NAS 3610 Minimum Airworthiness Requirements and Test Conditions for Air Cargo Unit Load Devices (latest amendment status)

2.2 FAR Documents:

Available from Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591.

FAR 25 Federal Aviation Regulations of FAA

2.3 Other Documents:

JAR 25 Joint Airworthiness Regulations of JAA

TSO C22 Seatbelts

TSO C39 Seats and Berths

TSO C90 Cargo Pallets, Nets, and Containers

TSO C116 Crew Member Protective Breathing Equipment

2.3 (Continued):

ULD Technical Manual 40/0 and 40/2 and 80/2

ECAC Doc. No. 18 Joint European Requirements for Emergency and Safety Airborne Equipment

TARC 82-29 Standards for Symbology and Graphic Signage Aboard Commercial Aircraft

RTCA DO 160C Environmental Condition and Test Procedures for Airborne Equipment

Advisory Circular (AC) FAA

A.C. 121-xx Flight Crew Sleeping Quarter A.C.

A.C. 25-9 Smoke Detection, Penetration and Evacuation Tests and Related Flight Manual Emergency Procedures

3. TYPES OF ULD-TYPE MOBILE CREWREST:

There are two types of MCRs; both have to comply with the aircraft requirements of the aircraft to be operated on; both have to be certified.

3.1 Type 1:

Designed for compatibility with the main cargo deck cargo loading and restraint system of wide body combined passenger/cargo aircraft.

3.2 Type 2:

Designed for compatibility in the lower deck cargo loading and restraint system of either all wide body passenger or combined passenger/cargo aircraft.

4. DESIGN OBJECTIVES:

4.1 General:

This document is intended to establish design objectives for a ULD-type mobile crewrest.

5. REQUIREMENTS:

5.1 Maintainability:

The MCR shall be designed and constructed to facilitate economical component inspection, adjustment, repair, and overhaul.

5.2 Service Life:

The useful service life for the MCR should be a minimum 20 years (service life is the life at which it is no longer physically or economically feasible to repair or overhaul the MCR to an acceptable cost standard).

5.3 Pressurization:

5.3.1 Pressure Equalization: If required by the construction, a pressure equalization device shall be installed for two-way equalization.

5.3.2 Rapid Decompression: Blow in/blow out panels shall be provided unless the design otherwise demonstrates to be safe in the event of a rapid decompression. The dimensions and the pressure difference to be considered are dependent on the location and size of the MCR. For further details required, see IATA Specification 80/2 paragraph 5.4 and definition of aircraft manufacturer.

5.4 Noise:

The MCR shall be sound insulated to reduce the ambient noises created by equipment installed in the MCR. Thirty second samples of A-weighted sound level (slow time weighting) measured at the head position of a resting crewmember should not exceed 70 db A. All other areas may be a 2 db A higher.

5.4.1 The MCR should be sufficiently soundproof to preclude sleep interruption from sudden, externally generated noise sources. Specific attention should be given to the closing of doors, the operation of systems in the immediate area (vacuum toilets, galleys, announcements over the cabin public address system).

5.4.2 The noise in the MCR should not contain any annoying audible tones although in the allowed sound level.

5.4.3 A test should be performed to demonstrate the noise attenuation reached by the sound insulation. The test should be done in two steps:

a. The MCR shall be installed in the aircraft during flight or under simulated flight noise conditions. This test is good for the acceptance test of the MCR. The noise level of the cargo compartment the MCR will be installed in must be known to the manufacturer of the MCR before development.

b. The MCR shall be installed in the way it will be used during flight by the flight attendants. This test is good for the aircraft acceptance to see if the noise values given by the aircraft manufacturer are correct and to find out noise sources to be considered with additional insulation material.

5.5 The base shall be designed to fit into the cargo loading and restraint system of the appropriate aircraft loading system and position on the aircraft to be loaded.

5.6 The maximum outside dimensions of the MCR shall conform to the maximum allowable ULD contour of the appropriate aircraft and position to be loaded in the aircraft. The dimensions may be extended in the forward or aft direction provided that adequate clearance to the respective walls is available.

5.7 The outside walls of the MCR and any interface item between aircraft structure and MCR must fulfill all applicable fire protection requirements of the aircraft compartment to be loaded into.

5.8 If the MCR is directly connected to the passenger cabin the MCR and each interface device between the aircraft and the MCR must fulfill the same leakage requirements as the appropriate compartment to be loaded into.

5.9 Doors and Accesses:

5.9.1 The MCR shall be equipped with a door (main deck) or if loaded in the lower deck an access from the main deck via a stairway/ladder.

5.9.2 There shall be at least an alternate evacuation route besides the regular access between the MCR and the passenger cabin for the occupants of the crew rest compartment. There shall be a sufficient amount of separation between the regular access and the additional evacuation route (TBD with authorities). Doors/hatches of the evacuation routes must be able to be opened from both sides. The evacuation of an incapacitated person (representative of a 95th percentile male) with assistance from the MCR to the passenger cabin must be demonstrated for both routes.

5.10 Air-Conditioning System:

5.10.1 Airflow: The airflow provided from the aircraft to the MCR shall be a minimum 10 cfm per occupying person. The flow should be monitored by means of a flow sensor in the air supply duct (see 5.10.6) 25 cfm supply air is recommended per person.

5.10.2 Distribution: The air distribution inside the MCR should avoid draft. The velocity of the air reaching the bunks should not exceed 40 ft/min.

5.10.3 Gasper Air: Each bunk shall be furnished with an individual gasper air nozzle. The airflow of each individual air outlet shall be a maximum $V_{individ.} = 3,2$ cfm.

5.10.4 Air Extraction: There shall be provisions to extract air out of the MCR preferably not forced by overpressure.

5.10.5 Temperature Control: The MCR shall provide means to control the temperature inside the MCR within a range of +18 °C to +25 °C.

5.10.6 Airflow Buzzer: If the air supply to the MCR decreases below 10 cfm x number of maximum occupants, an aural alarm shall warn the occupants.

5.10.7 Air Supply Interface Connection: The interface connection shall be accomplished by a flexible hose via a quick release connection. The diameter of the hose should be 104 mm (4 in). The location of the interface connection shall be in an easily accessible position to facilitate installation of the MCR.

5.11 Electrical System:

The MCR shall be equipped with the following systems.

5.11.1 Power Supply: The MCR shall be connected to the 115 V AC/400 Hz and 28 V DC power supply system of the aircraft. A main ON/OFF power switch shall be installed in the MCR. If required by the airline, 115 V AC/60 Hz and 220 V AC/50 Hz shall be provided (e.g., razors, vacuum cleaner, etc.).

5.11.2 General Illumination: A general illumination arrangement which can be switched on/off both inside and outside the MCR shall be provided.

5.11.3 Individual Reading Lights: Each bunk should have its own reading light.

5.11.4 Emergency Lights: Emergency lights and exit signs shall be installed. A floor path marking is not required.

5.11.5 Night Light: For comfort reasons a low intensity, permanently "on", night light may be installed.

5.11.6 Cabin Interphone: A cabin interphone shall be installed to allow communication between cabin/cockpit and MCR and vv and as a backup to the PA system.

5.11.7 PA-System: A PA system shall be installed to inform the MCR occupants in case of emergency and as a backup to the cabin interphone.

5.11.8 Oxygen System: An oxygen system similar to the system in the passenger cabin shall be installed to provide oxygen supply to the occupants in the event of rapid decompression.

5.11.9 Internal Smoke Detection System: An internal smoke detection system shall be installed to detect smoke in the MCR within a time of 60 s after origin.

5.11.10 Internal Fire Extinguishing System: If required by the certificating airworthiness authorities an automatic fire extinguishing system shall be installed. The quantity of the extinguishing agent shall be adequate to control and restrict a fire for the duration of each flight (see also 5.13.2).

5.11.11 Entertainment System (if required): If required by the airline, an audio and/or video system may be installed.

5.11.12 Other Equipment: If required by the airline, other equipment such as a refrigerator, microwave, oven etc. may be installed provided that the relevant installation requirements are met.