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Civil Aviation Authority

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Helicopter Public Address Systems

1 Applicability

This Specification applies to public address systems installed in helicopters for the purpose of broadcasting safety-related announcements to the occupants. The Specification prescribes minimum performance standards and installation requirements for such systems.

2 Systems Independence

The public address system shall be capable of operation independent of any flight crew to flight attendants' interphone system except for handsets, headsets, microphones, selector switches and signalling devices, which may be common to both systems.

3 Equipment and Installation

3.1 Environmental Qualification

3.1.1 The equipment shall be shown to be suitable for use in the environmental conditions associated with their installed positions in the helicopter when operated within the range of environmental conditions expected in service.

NOTE: Acceptable equipment environmental standards include EUROCAE ED-14C/RTCA DO-160C.

3.1.2 The system shall be capable of normal operation after its components have been subjected to the following ultimate inertia forces acting separately relative to the structure to which the equipment is attached:

The direction of forces, expressed as inertia load factors, shall be taken as relative to the helicopter.

20g downwards to 4g upwards

l6g forwards to 1.5g rearwards

0g to ±8g sideways

3.2 Equipment Performance

The Performance Characteristics of individual system components shall be such that, when used in combination, the overall performance of the Public Address System will meet the performance objectives of paragraph 5.

NOTE: Information for audio equipment characteristics is available in RTCA document DO-170, dated January 1980 and equivalent EUROCAE Document ED-18.

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3.3 Installation Requirements

The public address installation shall comply with the installation requirements of JAR 27/29, BCAR Section 0 or BCAR 29 as applicable to the helicopter concerned.

4 Accessibility for Use

4.1 Accessibility to Flight Crew

The public address system shall be accessible for immediate use from each of the flight crew member stations in the pilot compartment.

NOTE: Broadcasts initiated by the flight crew will need to have priority automatically over those initiated by flight attendants.

4.2 Accessibility to Flight Attendants

4.2.1 Where the carriage of flight attendants is required, at least one public address system microphone shall be positioned adjacent to any designated flight attendant seat.

4.2.2 The system shall be capable of operation within 10 seconds by a flight attendant at those stations in the compartment from which its use is accessible.

4.3 Controls

4.3.1 Controls which are not normally adjusted in flight shall not be readily accessible to the flight crew or to the flight attendants.

4.3.2 Where the output level of the system is controlled automatically as a function of flight phase, means to select manually the output to a high level shall be provided. This requirement need not be met where failure of the automatic level control to select a high level, when required, is shown to be REMOTE[1].

5 System Performance

5.1 The overall performance of the equipment and its installation shall be such that messages may be broadcast so as to be audible and intelligible at all passenger seats, lavatories, and flight attendant seats and work stations.

5.2 Where necessary to prevent acoustic instability during a broadcast, it is permissible to reduce automatically the output level of loudspeakers near a flight attendant's station from which the broadcast is being made.

5.3 When installed, any passenger entertainment systems or electronic passenger briefing systems will need to be muted when the public address system is being used for safety-related broadcasts, except where an electronic passenger briefing system is being used to augment the public address system. Where headphones are issued to passengers for use with the entertainment system, messages broadcast over the public address should be broadcast also through these headphones.

5.4 The performance of the system will need to be re-assessed following any significant modification to the cabin furnishings or layout.

5.5 Appendix 1 provides an acceptable means of performance assessment for the Public Address System based on subjective assessment. The Speech Transmission Index and Articulation Index methods permitted in aeroplanes, are not considered suitable for helicopters.

5.6 Messages from loudspeakers or headphones shall also be audible and intelligible if immersion suits are worn with hoods covering the ears or hearing protection is worn.

1. **REMOTE:** Unlikely to occur to each helicopter during its total operational life, but which may occur several times when considering the total operational life of a number of helicopters of the type.

5.7 If a dual channel PA amplifier (stereo) is used, the speakers allocated to each channel, should be arranged in a parallel formation, such that should a single channel of the amplifier fail, the remaining serviceable speakers give adequate audio broadcast to all areas of the cabin

6 Electrical Supply

The Public Address System shall be supplied from an electrical power source which provides continued operation for a minimum of 10 minutes following a total failure of the normal electrical generating system.

7 Maintenance Provisions

The certification tests shall include measurements at defined locations within the helicopter which establish performance reference levels suitable for subsequent maintenance checks of the system (Appendix 1, paragraph 3 refers). The periodicity of maintenance checks shall be agreed with the CAA.

NOTE: An acceptable means of compliance would be to specify minimum broadcast sound levels for defined locations within the helicopter.

8 Cockpit Voice Recorder

Attention is directed to CAA Specification No 11, as amended "Cockpit Voice Recorder Systems" which requires the broadcasts on the public address system to be recorded if a free channel is available on the Cockpit Voice Recorder.

Acknowledgment

The Public Address Working Group wishes to acknowledge its indebtedness to the Institute of Sound and Vibration Research at the University of Southampton and to the CAA for their assistance and advice given during the preparation of this specification.

Appendix 1

Demonstration Of System Performance

1 The applicant should conduct suitable ground and flight tests as agreed by the CAA, to show that the public address system, when adjusted, can be heard at all passenger seats, lavatories, and flight attendant seats and work stations. An acceptable means of conducting these tests would be to assess at each seat position phonetic sounds or a suitable phrase spoken from the pilots' positions and attendants' handset. The quality of the PA at each seat position should be assessed by more than one nominated person.

NOTE: If an electronic passenger briefing system is installed to augment the public address system, the quality of the briefing system at each seat position should also be assessed by more than one nominated person.

2 If the helicopter is operated with the occupants wearing headsets, hearing protection or immersion suits, the public address system should be adjusted so that it is audible and intelligible at all seat positions given in I, with the immersion suits, hearing protection or headsets donned. The test should be carried out in the cruise condition.

3 Following adjustment to a satisfactory level, the applicant should conduct measurements, using calibrated sound measuring equipment, at defined locations within the helicopter which establish performance reference levels suitable for subsequent adjustments or maintenance checks of the public address system.