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REV. A

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PASSENGER READING LIGHTS

1. INTRODUCTION: The purpose of this document is to recommend minimum design criteria which will lead to adequate performance standards for passenger reading lights in aircraft.

2. SCOPE: This recommended practice presents criteria for design and location of passenger reading lights in commercial aircraft.

3. DETAIL RECOMMENDATIONS:

3.1 Performance:

3.1.1 ø The reading light should provide average illumination on a flat horizontal circular or square reading surface located 203 mm (8 inches) above seat level. The width of the light pattern should be 457 mm (18 inches). Within the light pattern, the minimum intensity should be 53.8 lux (5 ft-c), and the maximum intensity should be 592 lux (55 ft-c). All intensity measurements should be made with a cosine-corrected illumination meter that is parallel to the horizontal surface. The center of the light pattern on the reading surface should be located on the fore and aft centerline of the seat and 533 mm (21 inches) from the base of the seat back (see Figure 1).

3.1.2 ø Illumination of the reading surface should remain within the recommendations of paragraph 3.1.1 when the reading surface has been rotated upward about its edge closest to the seat to an angle of 45 degrees from the horizontal.

3.1.3 ø With the reading plane surface in the horizontal position, not more than 16.1 lux (1.5 ft-c) should fall on the plane of the reading surface at a distance of 76 mm (3 inches) outside the edge of the reading surface around its periphery.

3.1.4 ø Should the light be adjustable, adjustment travel should be restricted, so that no light in excess of 16.1 lux (1.5 ft-c) fall on the arm rests of the seat or on the back of the next seat forward when that seat is fully reclined.

3.1.5 The light should be designed so that the lamp can emit light only in a downward direction, within the limits specified in paragraph 3.1.1.

3.1.6 It is not considered necessary to provide light for reading when the seat is full reclined.

3.1.7 Light location, louvers, or some other suitable means should be employed to insure that all light is directed downward at an angle of not less than 45 degrees from the horizontal.

3.2 Design and Installation:

3.2.1 The light and installation should be such that lamps are easily replaceable in flight without the use of special tools and with a minimum disturbance to passengers.

3.2.2 ø To ensure uniform lighting and to enable rapid replacement of nonoperating lamps, the proper lamp numbers should be easily readable when the lamp is accessed for removal.

3.2.3 ø The light switch should be easily accessible. Legend, switch actuator shape, and switch location should be chosen to facilitate distinguishing the light switch from the attendant call switch and from light switches for adjacent seats. All switches should be flush or recessed.

3.2.4 ø The light and installation should be such that the temperature of exposed surfaces is not uncomfortable to the touch. Temperatures of metal surfaces should not exceed 48.9 deg.C (120 deg.F) with an ambient temperature of 23.9 deg.C (75 deg.F). If surfaces are of a plastic material, slightly higher temperatures may be satisfactory. Downward heat radiation should be minimized. Heat rejection from the lamp should be controlled such that under continuous operation at maximum voltage and at 23.9 deg.C (75 deg.F) ambient temperature, components of the fixture will not be warped, discolored, or otherwise damaged, including solder and basing cement used in the lamp.

3.2.5 Reading light should be located and designed to reduce glare to a minimum.

3.2.6 Walls, window frames, and overhead surfaces should have a light-diffusing finish to minimize glare which might be annoying to adjacent passengers.

3.2.7 Ø Incandescent lamps should be operated at not more than 90% rated voltage to extend lamp life. Operation at 90% rated voltage will result in four times rated lamp life. Long life lamps (rated for 2000 hours or more) should be operated at not more than 95% rated voltage.

3.2.8 Ø Ballast and transformers should contain replaceable fuses or other circuit protectors to prevent overheating and smoke.

3.2.9 Ø If input voltage to the fixture exceeds 40 volts, an electrical ground should be provided.

3.2.10 Ø Performance should be determined and testing accomplished in accordance with applicable environmental conditions of Radio Technical Commission for Aeronautics (RTCA) Document No. DO-160B "Environmental Conditions and Test Procedures for Airborne Electronics/Electrical Equipment and Instruments", dated July 1984.

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