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EMERGENCY EVACUATION PROVISIONS

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PROVISIONAL ACCEPTABLE MEANS OF COMPLIANCEEMERGENCY EVACUATION PROVISIONSFOREWORD

1. The Standards in Annex 8, Airworthiness of Aircraft, are of the nature of broad specifications stating objectives rather than the methods of realizing those objectives. In order to indicate by example the level of airworthiness intended by the Standards of that Annex, some specifications of a more detailed and quantitative nature have been included in the same volume under the title "Acceptable Means of Compliance". The Foreword of Annex 8 indicates the obligation under the Convention, resulting from the introduction of Acceptable Means of Compliance.
2. When the Annex was adopted on 13 June 1957, the Standards on the subjects - Aeroplane Performance, Strength under Flight Loads, Reciprocating Engines, Turbine Engines, Propellers, and Navigation Lights - were supplemented by Acceptable Means of Compliance. The absence of provisions of that type pertaining to other subjects was considered either as recognition, by the Council, that the Standards in themselves defined a sufficiently accurate level of airworthiness, or as recognition, by the Council, that due to the technical developments going on in a subject at the time of adoption, it had not yet been possible to establish a more precise technical specification than that in the Standards themselves.
3. It is the essence of the Acceptable Means of Compliance that they permit variations in overall method as well as in detailed application. Therefore, Contracting States, in establishing national codes that will ensure compliance with the Standards, will sometimes need guidance as to the departures from Acceptable Means of Compliance that are suitable for the certification of aircraft other than those specified in their Range of Validity, and also as to the use of methods developed too recently to have behind them the suitable background of experience deemed necessary for introduction of an Acceptable Means of Compliance.
4. The guidance material is established by ICAO as "Provisional Acceptable Means of Compliance", a class of specification that does not impose any obligation under the Convention. The Provisional Acceptable Means of Compliance are not, like the Standards or the full-fledged Acceptable Means of Compliance, established by agreement between Contracting States; instead, they reflect an agreement reached by an international body of experts to the effect that a specification is worthy of trial.
5. Trial application of Provisional Acceptable Means of Compliance in national regulations or practices is intended to build up the amount of experience that could eventually lead to the introduction of an Acceptable Means of Compliance on the same subject.
6. The Provisional Acceptable Means of Compliance presented in the First Edition of this Circular (Circular 55-AN/50) was prepared by the Airworthiness Committee, a body of experts authorized by the Council and functioning under the Air Navigation Commission. The Airworthiness Committee proposed this Provisional Acceptable Means of Compliance in its second report issued at the end of its Second Meeting, which took place from 3 July to 29 July 1958. The Air Navigation Commission, after satisfying itself that this Provisional

Acceptable Means of Compliance was properly co-ordinated with the Standards, the Acceptable Means of Compliance, and other Provisional Acceptable Means of Compliance and that the policies of the Organization have been followed, approved issue of this Provisional Acceptable Means of Compliance at the Second Meeting of its Twenty-Ninth Session, on 9 October 1958. It is to be noted that in so doing, the Air Navigation Commission did not pass judgement on, or endorse, the technical contents recommended by the Airworthiness Committee.

7. The Provisional Acceptable Means of Compliance presented in this Second Edition of the Circular was prepared by the Airworthiness Committee at its Eighth Meeting, which was held from 22 April to 11 May 1968. A significant feature of this PAMC is that the manufacturer is required to demonstrate in practice to the certificating authorities that a fully representative load of passengers can be evacuated from an aeroplane, irrespective of its size and seating capacity, within 90 seconds using only the exits provided on one side of the aeroplane and without making use of any ventral or tail exit that may additionally exist. The PAMC also includes requirements for a new "Type A" exit for aeroplanes with 300 or more seats. The emergency exits are required to be uniformly distributed and also to be readily accessible. The assisting means for passenger emergency exits are required to be self-supporting, automatically deployable and capable of erection within 10 seconds. The Air Navigation Commission, after satisfying itself that this Provisional Acceptable Means of Compliance is properly co-ordinated with the ICAO Standards and related material and that the policies of the Organization have been followed, approved issue of this revised edition of the Provisional Acceptable Means of Compliance at the Eighteenth Meeting of its Fifty-Eighth Session on 26 June 1968. It is to be noted that, in so doing, the Air Navigation Commission did not pass judgement on, or endorse, the technical contents recommended by the Airworthiness Committee.

8. This PAMC contains specifications intended to provide for a level of airworthiness equivalent to that intended by the relevant provisions in paragraph 4.1.7 of Part III of Annex 8.

9. States are invited to use these specifications and to notify ICAO of the extent to which they are being applied. Should any State find it desirable or necessary to adopt any significant variations from the specifications, that State is invited to notify the Organization of such differences.

PROVISIONAL ACCEPTABLE MEANS OF COMPLIANCEEMERGENCY EVACUATION PROVISIONS1. GENERAL

1.1 Crew and passenger areas should be provided with emergency evacuation means to permit rapid egress, with the landing gear extended or retracted, taking into account the possibility of the aeroplane being on fire. If the aeroplane is divided into separate compartments arranged so that minimum unobstructed passageway between such compartments is not available as required in Section 8, these specifications should be applied to each compartment independently. Passenger and crew entrances and service doors may be considered as emergency exits if they meet the applicable requirements of this PAMC.

2. FLIGHT CREW EMERGENCY EXITS

2.1 Except for aeroplanes with passenger capacity of 20 or less in which the proximity of passenger emergency exits to the flight crew area offers a convenient and readily accessible means of evacuation for the flight crew, the type of exits and their location should be as indicated in paragraphs 2.1.1 and 2.1.2.

2.1.1 There should be two exits in the flight crew area, one on each side, or an acceptable equivalent arrangement.

2.1.2 The size, location and arrangements associated with each exit should be such as to allow rapid evacuation of the crew. An exit size and shape of other than at least 48 cm by 51 cm (19 in by 20 in) unobstructed rectangular opening may be used only if exit utility is satisfactorily shown by a typical flight crew member.

3. PASSENGER EMERGENCY EXITSType and location

3.1 All required exits should be in such specific locations as would afford the most effective means of passenger and cabin crew evacuation. The type and their general location should be as indicated in paragraphs 3.1.1 to 3.1.9.

3.1.1 TYPE I. This type should have a rectangular opening of not less than 61 cm (24 in) wide by 122 cm (48 in) high, with corner radii not greater than one third the width of the exit. Type I should be floor-level exits.

3.1.2 TYPE II. This type should have a rectangular opening of not less than 51 cm (20 in) wide by 112 cm (44 in) high, with corner radii not greater than one third the width of the exit. Type II exits should be floor-level exits unless located over the wing, in which case they may not have a step-up inside the aeroplane of more than 25 cm (10 in) or a step-down outside the aeroplane of more than 43 cm (17 in).

3.1.3 TYPE III. This type should have a rectangular opening of not less than 51 cm (20 in) wide by 91 cm (36 in) high, with corner radii not greater than one third the width of the exit, located over the wing, with a step-up inside the aeroplane of not more than 51 cm (20 in) and a step-down outside the aeroplane of not more than 69 cm (27 in).

3.1.4 TYPE IV. This type should have a rectangular opening of not less than 48 cm (19 in) wide by 66 cm (26 in) high, with corner radii not greater than one third the width of the exit, located over the wing, with step-up inside the aeroplane of not more than 74 cm (29 in) and a step-down outside the aeroplane of not more than 91 cm (36 in).

3.1.5 VENTRAL. This type is an exit from the passenger compartment through the pressure shell and the bottom fuselage skin. The dimensions and physical configuration of this type of exit should allow at least the same rate of egress as a Type I with the aeroplane in the normal ground attitude, with landing gear extended.

3.1.6 TAIL CONE. This type is an aft exit from the passenger compartment through the pressure shell and through an openable cone of the fuselage aft of the pressure shell. The means of opening the tail cone should be simple and obvious.

3.1.7 TYPE A. An emergency exit may be designated as a Type A exit if the following criteria are met:

3.1.7.1 There should be a rectangular opening not less than 106 cm (42 in) wide by 182 cm (72 in) high, with corner radii not greater than one sixth of the width of the exit.

3.1.7.2 It should be a floor-level exit.

3.1.7.3 Unless there are two or more main (fore and aft) aisles the exit should be located so that there is passenger flow along the main aisle to that exit from both the forward and aft direction.

3.1.7.4 There should be an unobstructed passageway at least 91 cm (36 in) wide leading from each exit to the nearest main aisle.

3.1.7.5 If two or more main aisles are provided, there should be unobstructed cross aisles at least 51 cm (20 in) wide between main aisles. There should be a cross aisle leading directly to each passageway between the exit and the nearest main aisle.

3.1.7.6 There should be at least one seat adjacent to each exit that could be occupied by a flight attendant.

3.1.7.7 Adequate assist space next to each Type A exit should be provided at each side of the passageway, to allow the crew member(s) to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required in paragraph 3.1.7.4.

3.1.7.8 At each non-overwing exit, a device installed in accordance with 5.6 should be capable of carrying simultaneously two parallel lines of evacuees.

3.1.7.9 Each overwing exit having a step-down should have an assist means unless the exit without an assist means can be shown to have a rate of passenger egress at least equal to that of the same type of non-overwing exit. If an assist means is required it should be automatically deployed and automatically erected, concurrent with the opening of the exit and self-supporting within 10 seconds.

3.1.8 Step-down distance in this section means the actual distance between the bottom of the required opening and a usable foothold extending out from the fuselage, that is large enough to be effective without searching by sight or feel.

3.1.9 Openings larger than those specified in this section, whether or not of rectangular shape, may be used if:

- (a) the specified opening can be inscribed within the available opening; and
- (b) the base of the available opening meets the specified step-up and step-down heights and provides a flat horizontal area at least as wide as that provided by the specified opening.

Number required

3.2 The prescribed exits need not be diametrically opposite each other or identical in size and location on both sides. They should be distributed as uniformly as practicable taking into account passenger distribution. The first prescribed floor-level exit on each side of the fuselage should be in the rearward part of the passenger compartment unless another location affords a more effective means of passenger evacuation. Where more than one floor-level exit per side is prescribed at least one floor-level exit per side should be located near each end of the cabin, except that this provision need not apply to combination cargo-passenger configurations. Except as provided in paragraphs 3.2.2 to 3.2.8 the number and type of passenger emergency exits should be in accordance with paragraph 3.2.1.

3.2.1 The relationship between the passenger seating capacity and the type and number of exits provided on each side of the fuselage should be as follows:

Passenger seating capacity (cabin attendants not included)	Emergency exits for each side of the fuselage			
	Type I	Type II	Type III	Type IV
1 to 10				1
11 to 19			1	
20 to 39		1		1
40 to 59	1			1
60 to 79	1		1	
80 to 109	1		1	1
110 to 139	2		1	
140 to 179	2		2	

3.2.2 Two Type IV exits may be installed instead of each Type III exit prescribed in paragraph 3.2.1.

3.2.3 If automatic slides meeting the requirements of paragraph 5.6.1 are installed at floor-level exits (other than overwing exits), the passenger/emergency exit relationship specified in paragraph 3.2.1 may be increased by:

- (a) not more than five passengers on aeroplanes with at least two of these exits; and
- (b) not more than 10 passengers on aeroplanes with at least four of these exits.

However, no increase in passenger seating capacity should be allowed under this paragraph if an increase in passenger seating capacity is obtained under paragraph 3.2.4.

3.2.4. An increase in passenger seating capacity above the maximum permitted under paragraph 3.2.1 but not to exceed a total of 299 may be allowed in accordance with the following table for each additional pair of emergency exits in excess of the minimum number prescribed in paragraph 3.2.1 for 179 passengers:

ADDITIONAL EMERGENCY EXITS (EACH SIDE OF FUSELAGE)	INCREASE IN PASSENGER SEATING CAPACITY ALLOWED
Type A	100
Type I	45
Type II	40
Type III	35

3.2.5 For passenger capacities in excess of 299, each emergency exit in the side of the fuselage must be either a Type A or a Type I. A passenger seating capacity of 100 may be allowed for each pair of Type A exits and a passenger seating capacity of 45 may be allowed for each pair of Type I exits.

3.2.6 If a passenger ventral or tail cone exit is installed and can be shown to allow a rate of egress at least equivalent to that of a Type III exit with the aeroplane in the most adverse exit opening condition because of the collapse of one or more legs of the landing gear, an increase in passenger seating capacity beyond the limits specified in paragraphs 3.2.1, 3.2.4 or 3.2.5 may be allowed as follows:

- (a) for a ventral exit, 12 additional passengers;
- (b) for a tail cone exit incorporating a floor-level opening of not less than 51 cm (20 in) wide by 153 cm (60 in) high with corner radii not greater than one third the width of the exit, in the pressure shell and incorporating an approved assist means in accordance with paragraph 5.6.1, 25 additional passengers; or
- (c) for a tail cone exit incorporating an opening in the pressure shell which is at least equivalent to a Type III emergency exit with respect to dimensions, step-up and step-down distance, and with the top of the opening not less than 142 cm (56 in) from the passenger compartment floor, 15 additional passengers.

3.2.7 For aeroplanes on which the vertical location of the wing does not allow the installation of overwing exits, an exit of at least the dimensions of a Type III should be installed instead of each Type III and each Type IV exit required by paragraph 3.2.1.

3.2.8 Each emergency exit in the passenger compartment, recognizable and available to the passengers and in excess of the minimum number of required emergency exits, need only meet applicable requirements of Sections 5 to 7, and should be readily accessible.

4. DITCHING EMERGENCY EXITS

4.1 If the emergency exits required by paragraph 3.2 do not meet the requirements of paragraphs 4.1.1 and 4.1.2, exits should be added to meet them.

4.1.1 A Type IV exit on each side of the aeroplane, both above the waterline, with passenger seating capacity of 10 or less.

4.1.2 A Type III exit for aeroplanes with passenger seating capacity of 11 or more, with at least one emergency exit above the waterline for each unit (or part of a unit) of 35 passengers, but no less than two such exits, with one on each side of the aeroplane. However, where it has been shown through analysis, ditching demonstration, or any other tests that the evacuation capability of the aeroplane during ditching is improved by the use of larger exits or by other means, passenger/exit ratio may be increased.

4.1.3 If side exits cannot be above the waterline, the side exits should be replaced by an equal number of readily accessible overhead hatches of not less than the dimensions of a Type III exit except that, for aeroplanes with passenger capacity of 35 or less, the two required Type III side exits may be replaced by only one overhead hatch.

4.1.4 Two Type IV exits may be installed instead of each required Type III exit.

5. EMERGENCY EXIT ARRANGEMENT

5.1 Each emergency exit should allow an unobstructed opening to the outside.

5.2 Each emergency exit should be openable from the inside and the outside except that sliding window emergency exits in the flight crew area need not be openable from the outside if other approved exits are convenient and readily accessible to the flight crew area.

5.3 The means of opening emergency exits should be simple and obvious and may not require exceptional effort in the most adverse exit opening condition because of the collapse of one or more legs of the landing gear. Internal exit-opening means involving sequence operations (such as operation of two handles or latches or the release of safety catches) may be used for flight crew emergency exits if it can be reasonably established that these means are simple and obvious to crew members trained in their use.

5.4 There should be a means to lock each emergency exit and to safeguard against its opening in flight, either inadvertently by persons or as a result of mechanical failure. In addition, there should be a means for direct visual inspection of the locking mechanism by crew members to determine that each emergency exit for which the initial opening movement is outward is fully locked.

5.5 There should be provisions to minimize the probability of jamming of the emergency exits resulting from fuselage deformation in a minor crash.

5.6 Each landplane emergency exit (other than exits located over the wing) more than 182 cm (72 in) from the ground with the aeroplane on the ground and a) with the landing gear extended, and b) with one or more legs of the landing gear collapsed, should have an approved means to assist the occupants in descending to the ground as indicated in paragraphs 5.6.1 and 5.6.2.

5.6.1 The assisting means for each passenger emergency exit should be a self-supporting slide or equivalent, and should be designed so that it is:

- (a) automatically deployed, and automatically erected, concurrent with the opening of the exit except that the assisting means may be erected in a different manner when installed at service doors that qualify as emergency exits, and at passenger doors; and
- (b) erectable within 10 seconds and of such length that the lower end is self-supporting on the ground after collapse of any one or more landing gear legs.

5.6.2 The assisting means for flight crew emergency exits may be a rope or any other means demonstrated to be suitable for the purpose. If the assisting means is a rope, or an approved device equivalent to a rope, it should be:

- (a) attached to the fuselage structure at or above the top of the emergency exit opening, or, for a device at a pilot's emergency exit window, at another approved location if the stowed device, or its attachment, would reduce the pilot's view in flight;
- (b) able (with its attachment) to withstand a 180 kg (400 lb) static load.

5.7 The proper functioning of each emergency exit should be shown by tests.

5.8 If the trailing edge of the flaps in the take-off or landing position is more than 182 cm (72 in) above the ground with the aeroplane on the ground and the landing gear extended, or if the wing is more than 182 cm (72 in) above the ground with the landing gear extended and the flaps are unsuitable as a slide, means should be provided to assist evacuees (who have used the overwing exits) to reach the ground.

6. EMERGENCY EXIT MARKINGS

6.1 Each passenger emergency exit, its means of access, and its means of opening should be conspicuously marked.

6.2 The identity and location of each passenger emergency exit should be recognizable from a distance equal to the width of the cabin.

6.3 Means should be provided to assist the occupants in locating the exits in conditions of dense smoke.

6.4 The location of each passenger emergency exit should be indicated by a sign visible to occupants approaching along the main passenger aisle. There should be a locating sign:

- (a) above the aisle near each overwing passenger emergency exit, or at another ceiling location if it is more practical because of low headroom;
- (b) next to each floor-level passenger emergency exit, except that one sign may serve two such exits if they can both be seen readily from the sign; and
- (c) on each bulkhead or divider that prevents fore and aft vision along the passenger cabin, to indicate emergency exits beyond and obscured by it, except that if this is not possible the sign may be placed at another appropriate location.

6.5 The location of the operating handle and instructions for opening should be shown:

- (a) for each passenger emergency exit, by a marking on or near the exit that is readable from a distance of 76 cm (30 in); and
- (b) for each Type I or Type II passenger emergency exit with a locking mechanism released by rotary motion of the handle, by:
 - (i) a red arrow, with a shaft at least 1.9 cm (0.75 in) wide and a head twice the width of the shaft, extending along at least 70° of arc at a radius approximately equal to three-fourths of the handle length; and
 - (ii) the word "OPEN" in red letters 2.5 cm (1 in) high, placed horizontally near the head of the arrow.

6.6. Each emergency exit that is required to be openable from the outside, and its means of opening, should be marked on the outside of the aeroplane.

6.6.1 The outside marking for each passenger emergency exit in the side of the fuselage should include a 5 cm (2 in) coloured band outlining the exit.

6.6.2 Each outside marking, including the band, should have colour contrast to be readily distinguishable from the surrounding fuselage surface.

6.6.3 In the case of exits other than those in the side of the fuselage, such as ventral or tail cone exits, the external means of opening, including instructions if applicable, should be conspicuously marked in red or bright chrome yellow if the background colour is such that red is inconspicuous. When the opening means is located on only one side of the fuselage, a conspicuous marking to that effect should be provided on the other side.

6.7 Emergency exits should at least be marked with the word "EXIT".

7. EMERGENCY LIGHTING

7.1 An emergency lighting system, independent of the main lighting system, should be installed which includes:

- (a) illuminated emergency exit marking and locating signs, sources of general cabin illumination, and interior lighting in emergency exit areas;
- (b) exterior emergency lighting.

7.2 Each passenger exit sign and each exit locating sign should have white letters at least 2.5 cm (1 in) high on a red background at least 5 cm (2 in) high. These signs may be internally electrically illuminated, or self-illuminated by other electrical means, with an initial brightness of at least 160 microlamberts. The colours may be reversed in the case of internally electrically illuminated signs if this will increase the illumination of the exit.

7.3 General illumination in the passenger cabin should be provided so that when measured along the centre line of main passenger aisles at seat armrest height and at 102 cm (40 in) intervals, the average illumination is not less than 0.05 foot-candle*. A main passenger aisle is considered to extend along the fuselage from the most forward passenger emergency exit or cabin occupant seat, whichever is farther forward, to the most rearward passenger emergency exit or cabin occupant seat, whichever is farther aft.

7.4 The floor of the passageway leading to each floor-level passenger emergency exit, between the main aisles and the exit openings, should be provided with illumination.

7.5 The emergency lighting system should be designed as follows:

- (a) the lights should be operable manually from the flight crew station and from a point in the passenger compartment that is readily accessible to a normal flight attendant seat. Means must be provided to safeguard against inadvertent operation of the manual controls;
- (b) when armed or turned on, the lights should remain lighted or become lighted upon interruption (except an interruption caused by a vertical separation of the fuselage during crash landing) of the aeroplane's normal electric power.

7.6 Exterior emergency lighting should be provided at each overwing exit so that the illumination is:

- (a) not less than 0.02 foot-candle (measured on a plane parallel to the surface) on a 0.186 m² (2 sq. ft.) area where an evacuee is likely to make his first step outside the cabin;
- (b) not less than 0.05 foot-candle (measured normal to the direction of the incident light) for a minimum width of 61 cm (24 in) along the 30 per cent of the escape route that is farthest from the exit; and

* 1 foot-candle = 1 lm/sq.ft. = 10.76 lx (lm/m²)

- (c) not less than 0.02 foot-candle on the ground surface with the landing gear extended (measured on a horizontal plane) where an evacuee using the established escape route would normally make first contact with the ground.

7.7 The means required in paragraphs 5.6.1 and 5.8 to assist the occupants in descending to the ground should be illuminated so that the deployed assist means is visible from the aeroplane.

7.7.1 If the assist means is illuminated by exterior emergency lighting, it should provide:

- (a) illumination at each overwing emergency exit of not less than 0.02 foot-candle on the ground surface with the landing gear extended (measured in a horizontal plane) where an evacuee using the established escape route would normally make first contact with the ground; and
- (b) illumination at each non-overwing emergency exit of not less than 0.03 foot-candle (measured normal to the direction of the incident light) at the ground end of the assist means and, for each non-overwing exit in the side of the fuselage, over a spherical surface 10° to either side of the centre of the assist means and from 30° above to 5° below the 45° position of the assist means.

7.7.2 If the assist means is self-illuminated, the lighting provisions:

- (a) may not be adversely affected by stowage; and
- (b) should provide sufficient ground surface illumination so that obstacles at the end of the assist means are clearly visible to evacuees.

7.8 The energy supply to each emergency lighting unit should provide the required level of illumination for at least 10 minutes at the critical ambient conditions after emergency landing.

7.9 If storage batteries are used as the energy supply for the emergency lighting system, they may be recharged from the aeroplane's main electric power system; PROVIDED that the charging circuit is designed to preclude inadvertent battery discharge into charging circuit faults.

7.10 Components of the emergency lighting system, including batteries, wiring relays, lamps, and switches should be capable of normal operation after having been subjected to the prescribed inertia forces.

7.11 The emergency lighting system should be designed so that after any single vertical separation of the fuselage during crash landing:

- (a) not more than 25 per cent of all electrically illuminated emergency lights required by this section are rendered inoperative, in addition to the lights that are directly damaged by the separation;

- (b) each electrically illuminated exit sign required in paragraph 6.4(b) remains operative exclusive of those that are directly damaged by the separation; and
- (c) at least one required exterior emergency exit light for each side of the aeroplane remains operative exclusive of those that are directly damaged by the separation.

8. EMERGENCY EXIT ACCESS

8.1 There should be a passageway between individual passenger areas, and leading from each aisle to each Type I and Type II emergency exit. These passageways should be unobstructed and at least 51 cm (20 in) wide.

8.2 For each passenger emergency exit covered by paragraph 5.6 there should be enough space next to the exit to allow a crew member to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required for the exit.

8.3 There should be access from each aisle to each Type III or Type IV exit. The access should not be obstructed by seats, berths, or other protrusions which would reduce the effectiveness of the exit. However, for aeroplanes having a maximum passenger seating capacity not exceeding 19, there may be minor obstructions if there are compensatory factors to maintain the effectiveness of the exit. For aeroplanes having a maximum seating capacity of 20 or more, the projected opening of the exit provided should not be obstructed by a seatback in any position at the outboard seat locations.

8.4 If it is necessary to pass through a passageway between passenger compartments to reach any required emergency exit from any seat in the passenger cabin, the passageway should be unobstructed. However, curtains may be used if they allow free entry through the passageway, and they are provided with means to hold them open, if required.

8.5 No door may be installed in any partition between passenger compartments.

8.6 If it is necessary to pass through a doorway separating the passenger cabin from other areas to reach any required emergency exit from any passenger seat, the door should have a means to latch it in open position. The latching means should be able to withstand the loads imposed upon it when the door is subjected to the prescribed ultimate inertia forces, relative to the surrounding structure.

9. WIDTH OF AISLE AND MAXIMUM NUMBER OF SEATS ABREAST

9.1 The passenger aisle width at any point between seats should equal or exceed the values in the following table:

Seating capacity	Minimum passenger aisle width cm (in)	
	Less than 63.5 cm (25 in) from floor	63.5 cm (25 in) and more from floor
10 or less	30 (12)	38 (15)
11 to 19	30 (12)	51 (20)
20 or more	38 (15)	51 (20)

9.2 On aeroplanes having only one passenger aisle, no more than 3 seats abreast should be placed on each side of the aisle in any one row.

10. DOORS

10.1 Each cabin should have at least one easily accessible external door.

10.2 There should be a means to lock and safeguard each external door against opening in flight (either inadvertently by persons or as a result of mechanical failure). Each external door should be openable from both the inside and the outside, even though persons may be crowded against the door on the inside of the aeroplane. Inward opening doors may be used if there are means to prevent occupants from crowding against the door to an extent that would interfere with the opening of the door. The means of opening should be simple and obvious and should be arranged and marked so that it can be readily located and operated, even in darkness. Auxiliary locking devices may be used.

10.3 Each external door should be reasonably free from jamming as a result of fuselage deformation in a minor crash.

10.4 Each external door should be located where persons using them will not be endangered by the propellers when appropriate operating procedures are used.

10.5 There should be a provision for direct visual inspection of the locking mechanism by crew members to determine whether external doors, for which the initial opening movement is outward (including passenger, crew, service, and cargo doors), are fully locked. In addition, there should be a visual means to signal to appropriate crew members when normally used external doors are closed and fully locked.

10.6 Cargo and service doors not suitable for use as an exit in an emergency need only meet paragraph 10.5 and be safeguarded against opening in flight as a result of mechanical failure.

10.7 Each passenger entry door in the side of the fuselage must qualify as a Type A, Type I, or Type II passenger emergency exit and should meet the requirements of paragraphs 3 to 8 which apply to that type of passenger emergency exit. If an integral stair is installed at such a passenger entry door, the stair must be designed so that when subjected to the prescribed inertia forces and following the collapse of one or more legs of the landing gear, it will not interfere to an extent that will reduce the effectiveness of emergency egress through the passenger entry door.

11. EMERGENCY EVACUATION DEMONSTRATION

11.1 Except as provided in paragraph 11.2, on aeroplanes having a seating capacity of more than 44 passengers, it should be shown by actual demonstration that the maximum seating capacity, including the number of crew members required by the operating rules, for which certification is requested can be evacuated from the aeroplane to the ground within 90 seconds. Evacuees using stands or ramps allowed by paragraph 11.1.8 are considered to be on the ground when they are on the stand or ramp, provided that the acceptance rate of the stand or ramp is no greater than the acceptance rate of the means

available on the aeroplane for descent from the wing during an actual crash situation. The demonstration should be conducted under the conditions specified in paragraphs 11.1.1 to 11.1.9.

11.1.1 The demonstration should be conducted either during the dark of the night or during daylight with the dark of the night simulated, utilizing only the emergency lighting system and utilizing only the emergency exits and emergency evacuation equipment on one side of the fuselage with the aeroplane in the normal ground attitude and with landing gear extended.

11.1.2 All emergency equipment should be installed in accordance with specified limitations of the equipment.

11.1.3 Each external door and exit, and each internal door and curtain should be in a configuration to simulate a normal take-off.

11.1.4 Seat belts and shoulder harnesses (as required) should be fastened.

11.1.5 A representative passenger load of persons in normal health should be used as follows:

- (a) at least 30 per cent should be female;
- (b) approximately 5 per cent should be over 60 years of age, with a proportionate number of females;
- (c) at least 5 per cent but no more than 10 per cent should be children under 12 years of age, prorated through that age group.

11.1.6 Persons who have knowledge of the operation of the exits and emergency equipment may be used to represent an air carrier crew. Such representative crew members should be in their seats assigned for take-off and landing and none may be seated next to an emergency exit unless that seat is his assigned seat for take-off. They should remain in their assigned seats until receiving the signal for the beginning of the demonstration.

11.1.7 There can be no practice or rehearsal of the demonstration for the passengers except that they may be briefed as to the location of all emergency exits before the demonstration.

11.1.8 Stands or ramps may be used for descent from the wing to the ground.

11.1.9 All evacuees other than those using an overwing exit should leave the aeroplane by the means provided as part of the aeroplane's equipment.

11.2 The emergency evacuation demonstration need not be repeated after a change in the interior arrangement of the aeroplane or an increase of not more than 5 per cent in passenger seating capacity over that previously approved by actual demonstration, or both, if it can be substantiated by analysis, taking due account of the differences, that all the passengers for which the aeroplane is certificated can evacuate within 90 seconds.

11.3 An escape route should be established from each overwing emergency exit, marked and (except for flap surfaces suitable as slides) covered with slip resistant surfaces.

ICAO TECHNICAL PUBLICATIONS

The following summary gives the status, and also describes in general terms the contents of the various series of technical publications issued by the International Civil Aviation Organization. It does not include specialized publications that do not fall specifically within one of the series, such as the ICAO Aeronautical Chart Catalogue or the Meteorological Tables for International Air Navigation.

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES are adopted by the Council in accordance with Articles 54, 37 and 90 of the Convention on International Civil Aviation and are designated, for convenience, as Annexes to the Convention. The uniform application by Contracting States of the specifications comprised in the International Standards is recognized as necessary for the safety or regularity of international air navigation while the uniform application of the specifications in the Recommended Practices is regarded as desirable in the interest of safety, regularity or efficiency of international air navigation. Knowledge of any differences between the national regulations or practices of a State and those established by an International Standard is essential to the safety or regularity of international air navigation. In the event of non-compliance with an International Standard, a State has, in fact, an obligation, under Article 38 of the Convention, to notify the Council of any differences. Knowledge of differences from Recommended Practices may also be important for the safety of air navigation and, although the Convention does not impose any obligation with regard thereto, the Council has invited Contracting States to notify such differences in addition to those relating to International Standards.

PROCEDURES FOR AIR NAVIGATION SERVICES (PANS) are approved by the Council for world-wide application. They comprise, for the most part, operating procedures regarded as not yet having attained a sufficient degree of maturity for adoption as International Standards and Recommended Practices, as well as material of a more permanent character which is considered too detailed for incorporation in an Annex, or is susceptible to frequent amendment, for which the processes of the Convention would be too cumbersome. As in the case of Recommended Practices, the Council

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REGIONAL SUPPLEMENTARY PROCEDURES (SUPPS) have a status similar to that of PANS in that they are approved by the Council, but only for application in the respective regions. They are prepared in consolidated form, since certain of the procedures apply to overlapping regions or are common to two or more regions.

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AIR NAVIGATION PLANS detail requirements for facilities and services for international air navigation in the respective ICAO Air Navigation Regions. They are prepared on the authority of the Secretary General on the basis of recommendations of regional air navigation meetings and of the Council action thereon. The plans are amended periodically to reflect changes in requirements and in the status of implementation of the recommended facilities and services.

ICAO CIRCULARS make available specialized information of interest to Contracting States. This includes studies on technical subjects as well as texts of Provisional Acceptable Means of Compliance.

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ICAO SALABLE PUBLICATIONS

Airworthiness Committee - Eighth Meeting.
 Amsterdam, 22 April - 11 May 1968.
 (Doc 8748-AN/890). 184 pp. U.S. \$3.00

ANNEXES TO THE CONVENTION

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 air transport. 6th edition, April 1967. 38 pp. U.S. \$1.00

Annex 8 - Airworthiness of aircraft. 5th edition,
 April 1962. 62 pp. U.S. \$1.50

PROCEDURES FOR AIR NAVIGATION SERVICES

OPS - Aircraft Operations.
 (Doc 8168-OPS/611). 2nd edition, 1967. 163 pp. U.S. \$3.00

CIRCULARS

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 Turbine engines - Type tests. 2nd edition, 1967. 14 pp. ... U.S. \$0.50

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