UNITED STATES OF AMERICA
CIVIL AERONAUTICS BOARD
WASHINGTON, D. C.

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Civil Air Regulations Amendment 4b-
Effective: December 20, 1951
Adopted: November 15, 1951

EMERGENCY EVACUATION PROVISIONS

The present regulations for doors and emergency exits on transport category airplanes as contained in §§ 4b.356 and 4b.362 of the Civil Air Regulations were promulgated for airplanes of a relatively smaller size than either many of those presently in operation or a majority of those which it is contemplated will be constructed in the future. The rapid increase in size of transport airplanes, the larger number of passengers carried in each, and the increased seriousness of crash fires due to greater fuel capacity, all indicate the need for a revision of these requirements.

It has been established by evacuation demonstrations that two large openings, one on each side of the aft portion of the fuselage, provide a means for more rapid and safe evacuation of passengers than any other type of exit presently in use. Accordingly, this amendment tends to require more and larger floor-level exits located well aft in the fuselage. Additional exits have also been specified to allow rapid evacuation of all passengers from either side of the airplane in the event that fire blocks the use of one side.

The question of crew exits is still under study, and more specific proposals are expected to be published in this regard when present studies have been completed. The Board is cognizant of the fact that there may be small airplanes certificated in accordance with Part 4b which are of such small size that it would be impracticable if not impossible to provide separate flight crew exits. In such cases separate exits will not be required provided that the Administrator finds them to be unnecessary in the particular model airplane.

Section 4b.356 (b) has also been amended in certain respects. The newly inserted first sentence corresponds with new § 4b.362 (c) (4), and is merely declaratory of the present practice of manufacturers. The remainder of the paragraph contains no new provisions; however, the requirement of a single handle to operate the door has been deleted. It has been brought to the attention of the Board that interpretations of the present rule do not allow any separate safetying devices and that an incipient hazardous condition may be created in certain situations. Although this change is needed to permit operators in their discretion to provide additional safety devices against inadvertent opening of doors in flight, it is of a minor nature and imposes no additional burden on any person.

With the exception of the amendment of § 4b.356 (b), interested persons have been afforded an opportunity to participate in the making of

this amendment, and due consideration has been given to all relevant matter presented. With respect to the amendment of § 4b.356 (b) the Board finds for reasons previously stated that notice and public procedure are unnecessary.

In consideration of the foregoing the Civil Aeronautics Board hereby amends Part 4b of the Civil Air Regulations (14 CFR, Part 4b, as amended) effective December 20, 1951:

1. By amending § 4b.356 (b) to read as follows:

4b.356 Doors. * * *

(b) Means shall be provided for locking each external door and for safeguarding against opening in flight either inadvertently by persons or as a result of mechanical failure. It shall be possible to open external doors from either the inside or the outside even though persons may be crowding against the door from the inside. The means of opening shall be simple and obvious and shall be so arranged and marked that it can be readily located and operated even in darkness.

2. By adding a new § 4b.356 (c) to read as follows:

4b.356 Doors. * * *

(c) Means shall be provided for a direct visual inspection of the locking mechanism by crew members to ascertain whether all external doors, including passenger, crew, service, and cargo doors, are fully locked (see also § 4b.362 (c) (5) for emergency exits). In addition, visual means shall be provided to signal to appropriate crew members that all normally used external doors are closed and in the fully locked position.

3. By amending § 4b.362 to read as follows:

4b.362 Emergency evacuation. Crew and passenger areas shall be provided with emergency evacuation means to permit rapid egress in the event of crash landings, whether with the landing gear extended or retracted, taking account of the possibility of the airplane being on fire. The provisions of this section shall apply to airplanes where the major portion of the passenger area is aft of the powerplant and the fuel tanks. In airplanes where the major portion of the passenger area is forward of the powerplant and the fuel tanks, or in airplanes of unconventional design where the emergency exit locations prescribed in paragraph (b) of this section would be inconsistent with safe and rapid egress of passengers, variations of emergency exit locations shall be allowed if found appropriate by the Administrator. Passenger entrance, crew, and service doors shall be considered as emergency exits if they meet the applicable requirements of this section.

(a) Flight crew emergency exits. Flight crew emergency exits shall be located in the flight crew area on both sides of the airplane or as a top hatch to provide for rapid evacuation. Such exits shall not be required on small airplanes where the Administrator finds that the proximity of passenger emergency exits to the flight crew area renders them convenient and readily accessible to the flight crew.

(b) Passenger emergency exits - type and location. The types of exits and their location shall be as follows:

(1) Type I: a rectangular opening of not less than 24 inches wide by 48 inches high, with corner radii not greater than 4 inches, located as far aft in the passenger area as practicable in the side of the fuselage at floor level.

(2) Type II: same as Type I (subparagraph (1) of this paragraph) except that the opening is not less than 20 inches wide by 44 inches high.

(3) Type III: a rectangular opening of not less than 20 inches wide by 36 inches high, with corner radii not greater than 4 inches, located as far aft in the passenger area as practicable in the side of the fuselage.

(4) Type IV: a rectangular opening of not less than 19 inches wide by 26 inches high, with corner radii not greater than 4 inches, located over the wing in the side of the fuselage with a step-up inside the airplane of not more than 29 inches and a step-down outside the airplane of not more than 36 inches.

NOTE: Larger openings than those specified in paragraph (b) of this section will be acceptable, whether or not of rectangular shape, provided the specified rectangular openings can be inscribed therein, and further provided that the base of the opening affords a flat surface not less than the width specified.

(c) Passenger emergency exits - number required. Emergency exits of type and location prescribed in paragraph (b) of this section shall be accessible to the passengers and shall be provided on each side of the fuselage in accordance with the following:

Passenger seating capacity	Emergency exits required on each side of fuselage			
	Type I	Type II	Type III	Type IV
1 to 19 inclusive	-	-	1	-
20 to 39 inclusive	-	1	-	1
40 to 69 inclusive	1	-	-	1
70 to 99 inclusive	1	-	-	2
100 to 139 inclusive	2	-	-	2

For airplanes with a passenger capacity of over 139 there shall be, in addition to the emergency exits prescribed for a passenger seating capacity of 100 to 139, inclusive, on each side of the fuselage, one Type I emergency exit for additional passengers up to 50, these exits to be located at such strategic points as would contribute most to the safe evacuation of passengers.

NOTE: Although similar exits and their locations are prescribed for each side of the fuselage, it is not the intent of this regulation to require that the exits necessarily be at locations diametrically opposite each other.

(d) Ditching emergency exits. Airplanes certificated in accordance with the ditching provisions of § 4b.261 shall be shown to have, on each side of the fuselage, not less than one emergency exit located above the water line for every 35 passengers: Provided, That for the purposes of this paragraph an easily accessible overhead hatch of not less than the clear dimensions of Type III emergency exits (see subparagraph (b) (3) of this section) shall be considered equivalent to one emergency exit on each side.

(e) Emergency exit arrangement.

(1) Emergency exits shall consist of movable doors or hatches in the external walls of the fuselage and shall provide an unobstructed opening to the outside.

(2) All emergency exits shall be openable from the inside and from the outside.

(3) The means of opening emergency exits shall be simple and obvious and shall not require exceptional effort of a person opening them.

(4) Means shall be provided for locking each emergency exit and for safeguarding against opening in flight either inadvertently by persons or as a result of mechanical failure.

(5) Means shall be provided for a direct visual inspection of the locking mechanism by crew members to ascertain whether all emergency exits are fully locked.

(6) Provision shall be made to minimize the possibility of jamming of emergency exits as a result of fuselage deformation in a minor crash landing.

(7) For all landplane emergency exits other than Type IV (see paragraph (b) of this section) which are more than 6 feet from the ground with the airplane on the ground and the landing gear extended, means shall be provided to assist the occupants in descending to the ground.

(8) The proper functioning of emergency exit installations shall be demonstrated by test.

(f) Emergency exit marking.

(1) All emergency exits, their means of access, and their means of opening shall be marked conspicuously. The identity and location of emergency exits shall be recognizable from a distance equal to the width of the cabin. The location of the emergency exit operating handle and the instructions for opening shall be marked on or adjacent to the emergency exit and shall be readable from a distance of 30 inches.

(2) A source or sources of light, with an energy supply independent of the main lighting system, shall be installed to illuminate all emergency exit markings. Such lights shall be designed to function automatically in a crash landing and shall also be operable manually.

(3) All emergency exits and their means of opening shall be marked on the outside of the airplane for guidance of rescue personnel.

(g) Emergency exit access. Passageways between individual compartments of the passenger area and passageways leading to Type I and Type II emergency exits (see paragraph (b) of this section) shall be unobstructed and shall be not less than 20 inches wide. Adjacent to emergency exits where assisting means are required by subparagraph (e) (7) of this section, there shall be sufficient additional space to allow a crew member to assist in the evacuation of passengers without reduction in the unobstructed width of the passageway to such exit.

(h) Width of main aisle. The main passenger aisle at any point between seats shall not be less than 15 inches wide up to a height above the floor of 25 inches and not less than 20 inches wide above that height.

(Sec. 205 (a), 52 Stat. 984; 49 U.S.C. 425 (a). Interpret or apply secs. 601, 603, 52 Stat. 1007, 1009; 49 U.S.C. 551, 553; 62 Stat. 1216)

By the Civil Aeronautics Board:

/s/ M. C. Mulligan

M. C. Mulligan
Secretary

(SEAL)

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