Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular

AC26-1

Additional Airworthiness Requirements

Initial Issue

31 October 2022

GENERAL

Civil Aviation Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes Explanatory Material (EM) where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with the airworthiness directive requirements of Part 26 and explanatory material to assist in showing compliance.

Rule 26 provided specific details regarding compliance requirements, so it was not considered necessary and useful to elaborate on every section of the Rule. Only few sections of the Rule have been further explained for ease of understanding the compliance requirements.

RELATED CAR

This AC relates specifically to Civil Aviation Rule Parts 26.

CHANGE NOTICE

There was no previous issue of this AC, consequently no change is in effect.

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1. INTRODUCTION

1.1 Source

All material used in this AC is mainly based on the various relevant sections of the FAA FAR 25, which has been referred to in the Rule 26 at various places.

1.2 Purpose

Part 26 rules prescribes the additional airworthiness requirements related to emergency exits that must be complied with for each PNG registered aircraft issued with an airworthiness certificate under Part 21.

This AC explains various sections of the Rule which were considered useful for the purpose of compliance. The material in the AC is considered both as a means of compliance as well provides explanation.

Markings and number of doors and emergency exits to be determined on an individual aircraft basis.

1.3 Definitions

Following definitions should be used when showing compliance with this rule part.

i) Doors – it includes all doors, hatches, openable windows, access panels, covers etc. on the exterior of the fuselage that do not require the use of tools to open or close. This also includes each door or hatch through a pressure bulkhead, including any bulkhead that is specifically designed to function as a secondary bulkhead under the prescribed failure conditions of part 25.

ii) Exit – it is a door designed to allow egress from the airplane (note that most exits are required to be emergency exits).

iii) Emergency exit – it is an exit designated to be used in an emergency evacuation.

iv) Latches are movable mechanical elements that, when engaged, prevent the door from opening.

v) Latched means the latches are fully engaged with their structural components and held in position by the latch operating mechanism.

vi) Latching system means the latch operating mechanism and the latches.

vii) Flight refers to that period from the start of takeoff roll until the airplane comes to rest after landing.

viii) Inadvertent action means an act committed, whether deliberate or not, that has unintended consequences.

APPENDIX A – All Aircraft

A.1 Marking of Doors and Emergency Exits

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

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

The location of each passenger emergency exit must be indicated by a sign visible to occupants approaching along the main passenger aisle (or aisles).

There must be means provided to assist the occupants in locating the exits in conditions of dense smoke.

APPENDIX B – Aeroplanes with a Type Certificated Seating Capacity of More than 9 Passengers

B.1 Doors and Exits

The means of opening emergency exits must be simple and obvious; may not require exceptional effort; and must be arranged and marked so that it can be readily located and operated, even in darkness. 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 crewmembers trained in their use.

Each emergency exit must 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. Each emergency exit must be capable of being opened when there is no fuselage deformation with the airplane in the normal ground attitude and in each of the attitudes corresponding to collapse of one or more legs of the landing gear.

B.2 Evacuation and Egress Provisions

Each required passenger emergency exit must be accessible to the passengers and located where it will afford the most effective means of passenger evacuation.

If only one floor-level exit per side is prescribed, and the airplane does not have a tail cone or ventral emergency exit, the floor-level exits must be in the rearward part of the passenger compartment unless another location affords a more effective means of passenger evacuation.

If more than one floor-level exit per side is prescribed, and the airplane does not have a combination cargo and passenger configuration, at least one floor-level exit must be in each side near each end of the cabin.

For an airplane that is required to have more than one passenger emergency exit for each side of the fuselage, no passenger emergency exit shall be more than 60 feet from any adjacent passenger emergency exit on the same side of the same deck of the fuselage, as measured parallel to the airplane longitudinal axis between the nearest exit edges.

APPENDIX C – Airplanes with a Type Certificated Seating Capacity of more than 19 passengers

C.1 Doors and Exits

For the purpose of this part, the types of exits are defined as follows:

(1) ***Type I.*** This type is a floor-level exit with a rectangular opening of not less than 24 inches wide by 48 inches high, with corner radii not greater than eight inches.

(2) ***Type II.*** This type is a rectangular opening of not less than 20 inches wide by 44 inches high, with corner radii not greater than seven inches. Type II exits must be floor-level exits unless located over the wing, in which case they must not have a step-up inside the airplane of more than 10 inches nor a step-down outside the airplane of more than 17 inches.

(3) ***Type III.*** This type is a rectangular opening of not less than 20 inches wide by 36 inches high with corner radii not greater than seven inches, and with a step-up inside the airplane of not more than 20 inches. If the exit is located over the wing, the step-down outside the airplane may not exceed 27 inches.

(4) ***Type IV.*** This type is a rectangular opening of not less than 19 inches wide by 26 inches high, with corner radii not greater than 6.3 inches, located over the wing, 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.

(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 must allow at least the same rate of egress as a Type I exit with the airplane in the normal ground attitude, with landing gear extended.

(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 must be simple and obvious and must employ a single operation.

C.2 Evacuation and Egress Provisions

C.2.1 Additional Emergency Exits

Flight crew emergency exits **-** For airplanes in which the proximity of passenger emergency exits to the flight crew area does not offer a convenient and readily accessible means of evacuation of the flight crew, and for all airplanes having a passenger seating capacity greater than 20, flight crew exits shall be located in the flight crew area. Such exits shall be of sufficient size and so located as to permit rapid evacuation by the crew. One exit shall be provided on each side of the airplane or, alternatively, a top hatch shall be provided. Each exit must encompass an unobstructed rectangular opening of at least 19 by 20 inches unless satisfactory exit utility can be demonstrated by a typical crew member.

Each emergency exit in the passenger compartment in excess of the minimum number of required emergency exits must meet the applicable emergency exit requirements, such as any other floor-level door or exit that is accessible from the passenger compartment and is as large or larger than a Type II exit, but less than 46 inches wide and any other ventral or tail cone passenger exit.

Whether or not ditching certification is requested, ditching emergency exits must be provided in accordance with the applicable requirements, unless the emergency exits installed as already meet the requirements.

Each emergency exit, including each flight crew emergency exit, must be a moveable door or hatch in the external walls of the fuselage, allowing an unobstructed opening to the outside. In addition, each emergency exit must have means to permit viewing of the conditions outside the exit when the exit is closed. The viewing means may be on or adjacent to the exit provided no obstructions exist between the exit and the viewing means. Means must also be provided to permit viewing of the likely areas of evacuee ground contact. The likely areas

of evacuee ground contact must be viewable during all lighting conditions with the landing gear extended as well as in all conditions of landing gear collapse.

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

Each emergency exit must have a means to retain the exit in the open position once the exit is opened in an emergency. The means must not require separate action to engage when the exit is opened and must require positive action to disengage.

C.2.2 Emergency Exit Access

Each required emergency exit must be accessible to the passengers and located where it will afford an effective means of evacuation. Emergency exit distribution must be as uniform as practical, taking passenger distribution into account; however, the size and location of exits on both sides of the cabin need not be symmetrical. If only one floor level exit per side is prescribed, and the airplane does not have a tail cone or ventral emergency exit, the floor level exit must 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 must be located near each end of the cabin, except that this provision does not apply to combination cargo/passenger configurations.

C.2.3 Emergency Exit Operating Handles

The location of the operating handle and instructions for opening exits from the inside of the airplane must be shown in such a way that each passenger emergency exit must have on or near the exit, a marking that is readable from a distance of 30 inches.

Each Type I passenger emergency exit operating handle must be self-illuminated with an initial brightness of at least 160 microlamberts; or be conspicuously located and well illuminated by the emergency lighting even in conditions of occupant crowding at the exit.

Each Type II passenger emergency exit with a locking mechanism released by rotary motion of the handle must be marked with a red arrow, with a shaft at least three-fourths of an inch wide and a head twice the width of the shaft, extending along at least 70 degrees of arc at a radius approximately equal to three-fourths of the handle length. So that the centreline of the exit handle is within ±1 inch of the projected point of the arrow when the handle has reached full travel and has released the locking mechanism, and with the word “open” in red letters 1 inch high, placed horizontally near the head of the arrow.

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

In the case of ventral or tail cone exists, the external means of opening, including instructions if applicable, must 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 must be provided on the other side.

Each sign required for the exit may use the word “exit” in its legend in place of the term “emergency exit.

C.2.4 Emergency Exit Evacuation Equipment

Each non over-wing airplane emergency exit more than 6 feet from the ground with the airplane on the ground and the landing gear extended, must have an approved means to assist the occupants in descending to the ground.

The assisting means for each passenger emergency exit must be a self-supporting slide or equivalent; and it must be automatically deployed, and deployment must begin during the interval between the time the exit opening means is actuated from inside the airplane and the time the exit is fully opened. However, each passenger emergency exit which is also a passenger entrance door, or a service door must be provided with means to prevent deployment of the assisting means when it is opened from either the inside or the outside under nonemergency conditions for normal use.

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 must be 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.

If an integral stair is installed in a passenger entry door that is qualified as a passenger emergency exit, the stair must be designed so that, under certain conditions, the effectiveness of passenger emergency egress will not be impaired:

C.2.5 Emergency Exit Escape Route

An escape route must be established from each over wing emergency exit, and (except for flap surfaces suitable as slides) covered with a slip resistant surface. Except where a means for channelling the flow of evacuees is provided the escape route from any common escape route from two Type III passenger emergency exits, must be at least 42 inches wide; that from any other passenger emergency exit must be at least 24 inches wide; and

The escape route surface must have a reflectance of at least 80 percent and must be defined by markings with a surface-to-marking contrast ratio of at least 5:1.

The floor of the passageway leading to each floor-level passenger emergency exit, between the main aisles and the exit openings, must be provided with adequate illumination and along the passenger evacuation path.

Floor proximity emergency escape path marking must provide emergency evacuation guidance for passengers. In the dark of the night, the floor proximity emergency escape path marking must enable each passenger to After leaving the passenger seat, visually identify the emergency escape path along the cabin aisle floor to the first exits or pair of exits forward and aft of the seat, after leaving the passenger seat, and readily identify each exit from the emergency escape path by reference only to markings and visual features.

C.2.6 Emergency Lighting

An emergency lighting system, independent of the main lighting system, must be installed. However, the sources of general cabin illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency lighting system is independent of the power supply to the main lighting system.

The emergency lighting system must include the illuminated emergency exit marking and locating signs, sources of general cabin illumination, interior lighting in emergency exit areas, floor proximity escape path marking, and exterior emergency lighting.

If storage batteries are used as the energy supply for the emergency lighting system, they may be recharged from the airplane main electric power system: *Provided* that, the charging circuit is designed to preclude inadvertent battery discharge into charging circuit faults.

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

C.2.7 Emergency Interior Lighting

The emergency lighting system must be designed as follows.

The lights must 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.

There must be a flight crew warning light which illuminates when power is on in the airplane and the emergency lighting control device is not armed.

The cockpit control device must have an “on,” “off,” and “armed” position so that when armed in the cockpit or turned on at either the cockpit or flight attendant station the lights will either light or remain lighted upon interruption (except an interruption caused by a transverse vertical separation of the fuselage during crash

landing) of the airplane normal electric power. There must be a means to safeguard against inadvertent operation of the control device from the “armed” or “on” positions.

C.2.8 Emergency Exterior Lighting

Exterior emergency lighting must be provided as follows:

At each over wing emergency exit the illumination must be not less than 0.03 foot-candle (measured normal to the direction of the incident light) on a 2-square-foot area where an evacuee is likely to make his first step outside the cabin.

If the assist means is illuminated by exterior emergency lighting, it must provide illumination of not less than 0.03 foot-candle (measured normal to the direction of the incident light) at the ground end of the erected assist means where an evacuee using the established escape route would normally make first contact with the ground, with the airplane in each of the attitudes corresponding to the collapse of one or more legs of the landing gear.

If the emergency lighting subsystem illuminating the assist means serves no other assist means, is independent of the airplane's main emergency lighting system, and is automatically activated when the assist means is erected, the lighting provisions may not be adversely affected by stowage; and must provide illumination of not less than 0.03 foot-candle (measured normal to the direction of incident light) at the ground and of the erected assist means where an evacuee would normally make first contact with the ground, with the airplane in each of the attitudes corresponding to the collapse of one or more legs of the landing gear.

C.2.9 Emergency Exit Marking

Each passenger emergency exit, its means of access, and its means of opening must be conspicuously marked. The identity and location of each passenger emergency exit must be recognizable from a distance equal to the width of the cabin.

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

The location of each passenger emergency exit must be indicated by a sign visible to occupants approaching along the main passenger aisle (or aisles). There must be—

(1) A passenger emergency exit locator sign above the aisle (or aisles) near each passenger emergency exit, or at another overhead location if it is more practical because of low headroom, except that one sign may serve more than one exit if each exit can be seen readily from the sign.

(2) A passenger emergency exit marking sign next to each passenger emergency exit, except that one sign may serve two such exits if they both can be seen readily from the sign: and

(3) A sign on each bulkhead or divider that prevents fore and aft vision along the passenger cabin to indicate emergency exits beyond and obscured by the bulkhead or divider, except that if this is not possible the sign may be placed at another appropriate location.

The floor of the passageway leading to each floor-level passenger emergency exit, between the main aisles and the exit openings, must be provided with illumination that is not less than 0.02 foot-candle measured along a line that is within 6 inches of and parallel to the floor and is cantered on the passenger evacuation path.

C.3 Lavatory Fire Protection

For airplanes with a passenger capacity of 20 or more:

- Each lavatory must be equipped with a smoke detector system or equivalent that provides a warning light in the cockpit, or provides a warning light or audible warning in the passenger cabin that would be readily detected by a flight attendant; and
- Each lavatory must be equipped with a built-in fire extinguisher for each disposal receptacle for towels, paper, or waste, located within the lavatory. The extinguisher must be designed to discharge automatically into each disposal receptacle upon occurrence of a fire in that receptacle

C.4 Materials for Compartment Interiors

For each compartment occupied by the crew or passengers, the following apply (ref FAR 25.853 for Compartment Interiors):

(a) Materials (including finishes or decorative surfaces applied to the materials) must meet the applicable test criteria prescribed in part I of appendix F of FAR part 25, or other approved equivalent methods, regardless of the passenger capacity of the airplane.

(b) In addition to meeting the requirements of paragraph (a) of this section, seat cushions, except those on flight crewmember seats, must meet the test requirements of part II of appendix F of this part, or other equivalent methods, regardless of the passenger capacity of the airplane.

(c) Except as provided in paragraph (d) of this section, the following interior components of airplanes with passenger capacities of 20 or more must also meet the test requirements of parts IV and V of appendix F of this part, or other approved equivalent method, in addition to the flammability requirements prescribed in paragraph (a) of this section:

(1) Interior ceiling and wall panels, other than lighting lenses and windows.

(2) Partitions, other than transparent panels needed to enhance cabin safety.

(3) Galley structure, including exposed surfaces of stowed carts and standard containers and the cavity walls that are exposed when a full complement of such carts or containers is not carried; and

(4) Large cabinets and cabin stowage compartments, other than under seat stowage compartments for stowing small items such as magazines and maps.

(d) The interiors of compartments, such as pilot compartments, galleys, lavatories, crew rest quarters, cabinets, and stowage compartments, need not meet the standards of paragraph (c) of this section, provided the interiors of such compartments are isolated from the main passenger cabin by doors or equivalent means that would normally be closed during an emergency landing condition.

C.5 Cargo and Baggage Compartments

For the purpose of this part, the types of cargo and baggage compartments are defined as follows -

A **Class A** cargo or baggage compartment is one in which the presence of a fire would be easily discovered by a crewmember while at his station; and each part of the compartment is easily accessible in flight.

A **Class B** cargo or baggage compartment is one in which there is sufficient access in flight to enable a crewmember, standing at any one access point and without stepping into the compartment, to extinguish a fire occurring in any part of the compartment using a hand fire extinguisher.

When the access provisions are being used, no hazardous quantity of smoke, flames, or extinguishing agent, will enter any compartment occupied by the crew or passengers.

There is a separate approved smoke detector or fire detector system to give warning at the pilot or flight engineer station.

A **Class C** cargo or baggage compartment is one not meeting the requirements for either a Class A or B compartment but in which there is a separate approved smoke detector or fire detector system to give warning at the pilot or flight engineer station.

There is an approved built-in fire extinguishing or suppression system controllable from the cockpit. There are means to exclude hazardous quantities of smoke, flames, or extinguishing agent, from any compartment occupied by the crew or passengers.

There are means to control ventilation and drafts within the compartment so that the extinguishing agent used can control any fire that may start within the compartment.

A **Class E cargo** compartment is one on airplanes used only for the carriage of cargo and in which there is a separate approved smoke or fire detector system to give warning at the pilot or flight engineer station.

There are means to shut off the ventilating airflow to, or within, the compartment, and the controls for these means are accessible to the flight crew in the crew compartment.

There are means to exclude hazardous quantities of smoke, flames, or noxious gases, from the flight crew compartment; and the required crew emergency exits are accessible under any cargo loading condition.

A **Class F** cargo or baggage compartment must be located on the main deck and is one in which there is a separate approved smoke detector or fire detector system to give warning at the pilot or flight engineer station.

There are means to extinguish or control a fire without requiring a crewmember to enter the compartment; and there are means to exclude hazardous quantities of smoke, flames, or extinguishing agent from any compartment occupied by the crew or passengers.

APPENDIX D – Helicopters

The rule is self-explanatory.

APPENDIX E – Agricultural Aircrafts

The rule is self-explanatory.