

CHAPTER 15

MEANS OF ESCAPE: PASSENGER SHIPS, CARGO SHIPS AND TANKERS (L.S. REGULATIONS 68, 84 AND 101 AND SS REGULATION 44)

15.1 Details of the 'Means of Escape'

15.1.1 General comment

15.1.1.1 Documentary evidence - plans, calculations, specifications etc. covering the points listed below in paragraph 15.1.2, to show how compliance with the regulations is to be achieved, must be prepared by the shipowner, his agent or the shipbuilder. Such evidence should be in English or be provided with adequate translation in English, and metric units should be used for all measurements. When prepared, this information should be submitted for examination in the following manner:

- (a) passenger ships of Classes I, II and II(A); to the surveyor conducting the survey of the ship, after which it should be submitted to MCA, together with any pertinent comments, for final consideration; and
- (b) all other ships; to the surveyor conducting the survey of the ship. Reference to MCA will be necessary only if the inspecting surveyor requires specific advice on any aspect of the proposals presented.

15.1.2 The information to be submitted

15.1.2.1 In all cases, a general arrangement plan drawn to scale of not less than 1:100 should be prepared and if should include, as appropriate, the following information:

- (a) the purpose for which each space in the ship is to be used and the position of the door or doors serving each space; and
- (b) the width of stairways, ladderways, corridors and doorways and the dimensions of trunks, hatches, windows and escape panels which form part of any escape route or supplementary escape.
- (c) plus the following information for:
 - (i) Ships of Classes I, II and II(A);

The number of passengers and crew for which each cabin, suite and public room is intended, and also the proposed routes to the muster

stations and then on to the embarkation stations (see also paragraph 4.3 of IMO Resolution A 757(1B));

(ii) Ships of Classes II to VI(A) carrying deck passengers:

The number of passengers for which each enclosed space would measure and for ships of Classes III to VI(A) such greater number of passengers as may use each enclosed space in bad weather; and

iii) Cargo ships and tankers;

The number of crew and passengers, if any, for which each cabin, suite and public room is to be used.

15.2 General Requirements - Applicable to all Ships

The following general requirements apply to the escape arrangements of all ships - passenger ships, cargo ships and tankers - except where specifically indicated otherwise.

15.2.1 Separation of escapes

The principal means of escape from a space or group of spaces should be separated as widely as possible.

15.2.2 Stairways and ladderways

15.2.2.1 The width is to be measured on the tread within the sides or between the handrails, whichever is the least.

15.2.2.2 Stairways should not extend in a single flight more than one 'tweendeck or a vertical distance of 3 m whichever is the least. Stairways in adjacent 'tweendecks within the same enclosure should, wherever possible, be offset if sloping in the same direction or slope in different directions.

15.2.2.3 In either case, the stairways should be separated by a landing having its shorter dimension not less than the width of the wider stairway. However when it is only possible to arrange such stairways to slope in the same direction without being offset, they should be separated by a landing having a length not less than 2 m.

15.2.2.4 Curved stairways should be such that they do not present a hazard to passengers and crew. It should be borne in mind that such stairways may be used in an emergency situation by both elderly and very young passengers (see also paragraph 15.3.3).

15.2.2.5 Nosings on treads should be kept to minimum dimensions in order to reduce the risk of passengers and crew tripping over them and should be of the same sectional shape on all treads of a stairway.

15.2.2.6 Stairways and ladderways should be fitted on each side with an efficient handrail which in the case of stairways should be continued unbroken from the slope of the stairway round each landing to the entrance to the stairway enclosure or connected to the handrails in the corridor whenever the regulations permit a stairway to be open to the corridor.

15.2.2.7 Stairways and ladderways should, as far as possible, be pitched fore and aft, not athwartships, and should normally be inclined at not less than 45° to the vertical.

15.2.2.8 In general the rise of each step should be kept constant to facilitate easy movement up (or down) the stairway, especially in an emergency situation.

15.2.2.9 See also paragraph 12.6.7 regarding the stowage of equipment in stairway enclosures.

15.2.3 Flexible ladders (not acceptable)

Flexible ladders, i.e. ladders having strings of flexible steel wire rope (or chains) are not acceptable as forming part of any escape route.

15.2.4 Corridors and doorways

15.2.4.1 Corridors and doorways providing access to and from stairways or open decks should be of sufficient width to prevent congestion and, in the case of those serving stairways, should not be less than the width of the stairways.

15.2.4.2 Handrails should be fitted in corridors at an approximate height of 1000mm above the deck.

15.2.4.3 The width of a corridor should be measured between handrails or the handrail and the opposite bulkhead whichever is applicable.

15.2.5 Escalators

Escalators may be treated as stationary stairways for the purpose of this chapter. (In such cases the surveyor should ensure that adequate deck area is provided in the enclosure at each end of the escalator in order to avoid any congestion. In addition the doors in the enclosure bulkheads should be wide enough to permit passengers to disperse quickly. Due regard should be paid to the design and positioning of the controls so as to reduce the risk of their unauthorised use. The emergency stop controls should however be in positions readily accessible from the escalator).

15.2.6 Lifts (L.S. Regulations 68 and 84(6))

In no case should lifts be considered as means of escape (but see paragraph 15.3.2).

15.2.7 Public rooms used for concerts etc. (L.S. Regulation 68(3) and S.S. Regulation 44(6))

When a public room in a passenger ship (any class) is to be used for concerts, cinema shows etc., and lighting is to be subdued, the illuminated signs marking the exits should be in white lettering approx. 180mm high on a green background. Each door which does not afford a safe escape from the space should be provided with an illuminated sign indicating 'NO EXIT' in white lettering approx. 180mm high on a red background.

15.2.8 Escape windows and sidescuttles (L.S. Regulation 68(2)(g) and 84(1)(g))

Where the second means of escape from a space such as a radio office is provided by an opening window or sidescuttle, the window should be of the fully opening type of suitable dimensions and the sidescuttle should be not less than 450mm in diameter. When such a window or sidescuttle is locked by cone nuts to prevent unauthorised opening e.g. in lieu of mosquito protection in crew spaces on air conditioned ships, a special key should be provided in a glass-fronted box adjacent to the window or sidescuttle.

15.2.9 Hatches

15.2.9.1 Where hatches are provided as the second means of escape for crew from accommodation spaces, the hatches should be of such dimensions as will allow a person to escape wearing a lifejacket.

15.2.9.2 Any hatch provided for escape from crew accommodation or working spaces should not be capable of being locked and should be operable from below and above. It is preferable for such a hatch to be provided with a counter-balance weight for ease of opening. Access to the hatch should be by means of a fixed steel ladder.

15.2.9.3 The surveyor should ensure that escape hatches are so sited that they cannot be overstowed with deck cargo or stores or, in the case of spaces below a special category space or Ro-Ro cargo space, that vehicles cannot be parked over them or prevent them from being opened fully. In some cases it may be necessary to site the hatches on raised kerbs or be protected by substantial stanchions and rails. In no case should painted lines be accepted as the means of protecting such hatches.

15.2.9.4 When the hatches are fitted in 'A' Class or 'B' Class decks, their construction should be such that the integrity and insulation standards of the decks are not impaired.

15.2.10 Escape panels

15.2.10.1 In certain instances, 'escape panels' may be used with advantage to provide an alternative means of escape. However, in no case should an escape route incorporate more than one escape panel.

15.2.10.2 An 'escape panel' should be fitted so that it can be kicked-out with the minimum of effort and should be clearly marked to indicate its purpose. Where an escape panel is utilised to provide an escape to another compartment, the surveyor should ensure that the door to that compartment opens onto a corridor and is capable of being opened from inside at all times.

15.2.10.3 Escape panels should not be fitted in any escape route providing access for passengers to the muster stations or lifeboat, liferaft and marine escape system embarkation positions.

15.2.10.4 Escape panels should not be fitted in 'A' Class bulkheads or doors and when they are fitted in 'B' Class bulkheads or doors their construction should be such that the integrity and insulation standards of the bulkheads and doors are not impaired. See also paragraph 11.10.4.

15.2.11 Sleeping rooms in crew accommodation

15.2.11.1 It is necessary to provide an emergency means of escape from sleeping rooms where access to such a sleeping room is by way of a dayroom, there being no direct access by means of a door to the sleeping room from a corridor. Ideally the crew accommodation should be designed so that a sleeping room is so positioned that an emergency escape therefrom is not required. However, where there is a need to provide an emergency escape from a sleeping room, this should be achieved by fitting a clearly marked escape panel to an adjacent room or corridor as indicated in paragraph 15.2.10 or, where this is not possible, by an escape window or sidescuttle as indicated in paragraph 15.2.8.

15.2.11.2 Where a dayroom is fitted with a smoke detector as part of an approved 'fixed fire detection and fire alarm system' a second means of escape will not be required.

15.2.12 Crew messrooms, recreation rooms etc.

When messrooms, recreation rooms, cinemas, television rooms and similar communal spaces are provided to accommodate more than 15 crew members at any one time, such spaces in general should have two doors to the adjacent corridor. In cases where this is not possible, in addition to the provision of a door to the corridor, a door to the open deck should be provided, or if this is also not possible, an escape window or sidescuttle may be accepted as indicated in paragraph 15.2.8.

15.2.13 Doors in crew accommodation

15.2.13.1 In general, all doors which are not type approved should be of the hinged type. Where it is not practicable to provide a hinged door, a sliding door may be accepted provided that in the case of a 'C' Class door it can be readily removed from its rails from each side of the door or an escape panel is fitted in the sliding door.

15.2.13.2 Doors in an escape route should not normally be locked closed. However, doors which give access to 'sensitive areas' may be locked for security purposes, provided the surveyor is satisfied that the escape routes will remain viable. Any questions on such arrangements should be raised with MCA. See also the comments made in paragraph 11.10.5.

15.3 Requirements Applicable to Passenger Ships of Class I (L.S. Regulation 68)

The following requirements apply specifically to passenger ships of Class I and are additional to those stated in paragraph 15.2.

15.3.1 Widths of stairways and ladderways (L.S. Regulation 68(1))

The minimum aggregate width of stairways and ladderways, by which passengers and crew are specifically routed to the muster stations and/or lifeboat, liferaft and marine escape system embarkation positions, is to be determined as indicated in IMO Resolution A 757(18).

15.3.2 Opening direction of doors along escape routes

The doors along escape routes should not, in general, open against the flow. The following exceptions should be noted:

15.3.2.1 the cabin doors, may in general, open into the cabins in order to avoid damage to persons in a corridor when the door is opened; and

15.3.2.2 the doors in vertical emergency escape trunks should, in general, open out of the trunk in order to permit the trunk to be used for both escape and access purposes. [unified text]

15.3.3 The carriage of elderly and disabled passengers

Surveyors should ensure that shipowners and shipbuilders are conversant with the contents of MGN 31(M) and the IMO publication MSC/Circ 735 of June 1996 entitled; 'Recommendation on the Design and Operation of Passenger Ships to Respond to Elderly and Disabled Persons needs'.

15.3.4 Continuous fire shelters (L.S. Regulation 68(2)(c))

Where a stairway providing continuous fire shelter has no direct access to the lifeboat, liferaft and marine escape system embarkation decks, the corridors between the stairway and the decks should be assumed to be part of the stairway enclosure with its division having the appropriate 'A' Class standards accordingly. See also paragraph 15.2.4.

15.3.5 Size of landings and intermediate landings

If landings can be entered directly via entrance doors situated in stairway enclosures, the area of such landings should comply with the requirements of L.S. Regulation 68(2)(ii)(ee). However, if landings cannot be entered by entrance doors, such landings should be considered as intermediate landings, which should comply with the capacity requirements given in L.S. Regulation 68(2)(ii)(cc). **[unified text]**

15.3.6 Access from stairway enclosures to embarkation areas

Access from the stairway enclosures to the lifeboat and liferaft embarkation area should be provided either directly or through an internal route which has fire integrity and insulation values for stairway enclosures as determined by the tables referred to in L.S. Regulation 54 (1). **[unified text]**

15.3.7 Crew spaces

In a space or group of spaces allocated solely to crew, the means of escape referred to in L.S. Regulation 68(2)(a) and (b) may consist of one stairway providing continuous fire shelter to the lifeboat, liferaft and marine escape system embarkation decks or, where necessary, to a higher deck and another stairway or vertical ladder giving access to the deck above through an escape hatch with access from that deck to the embarkation decks. In certain circumstances, depending upon the layout of the spaces under consideration and the positions of the stairway, it may be necessary to provide two escape hatches, one port and one starboard, in order to ensure that a fire in a particular location would not render escape impossible from some spaces.

15.3.8 Special category spaces (L.S. Regulation 68(2)(i))

The stairways forming the means of escape from each special category space should be suitably spaced in order to provide adequate coverage to the whole of the space. In general, at least one stairway should be provided at each end of the space and one stairway at approximately mid-length, each of which provides continuous fire shelter to the lifeboat, liferaft and marine escape system embarkation positions or, where necessary, to a higher deck. However, in ships fitted with two or more casings, this spacing of stairways providing continuous fire shelter should apply to each casing. Suitable signs to indicate the route to the escape stairways should be provided.

15.3.9 Walkways in special category spaces

Special category spaces used for the stowage of motor vehicles, should be provided with walkways to the means of escape with a breadth of at least 600mm. [unified text]

15.3.10 Ro-Ro cargo spaces (L.S. Regulation 68(2)(i))

Ro-Ro cargo spaces should be fitted with at least one stairway providing continuous fire shelter to the lifeboat, liferaft and marine escape system embarkation decks or, where necessary, to a higher deck and a stairway or ladder giving access to the deck above through an escape hatch with access from that deck to the embarkation decks. The two means of escape should be situated at opposite ends of the Ro-Ro cargo space or as near thereto as practicable. Additional means of escape may be necessary in a space which extends longitudinally over a considerable portion of the ships length. Suitable signs to indicate the route to the escape stairways should be provided.

15.3.11 Vertical ladders

In no case should any escape route providing access for passengers to the lifeboat, liferaft and marine escape system embarkation decks incorporate a vertical or near vertical ladder.

15.3.12 Machinery spaces (L.S. Regulation 68(5))

15.3.12.1 The continuous fire shelter which is required by L.S. Regulation 68(5)(a)(i) to be provided for one of the two means of escape from each machinery space should be regarded as a stairway enclosure for the purpose of determining the 'A' Class standards to which it should be insulated in way of adjacent spaces.

15.3.12.2 The shelter should extend from the floor plate level at which there is direct access into a space, other than a special category space, or Ro-Ro cargo space, which provides a safe escape route to the embarkation deck.

15.3.12.3 The shelter should be of sufficient cross sectional dimensions (but not less than 800mm x 800mm) to provide unrestricted access within its

height and should not be used for pipes, cables, ducts etc. except for electric cables serving light fittings within the shelter.

15.3.12.4 The cross sectional dimensions of the shelter should be increased in way of each opening in order to provide a landing within the shelter and permit the door to open without affecting a person who may be climbing the ladder.

15.3.12.5 An opening into the shelter should be provided at floor plate level and at each flat or grating level within the height of the shelter except that such an opening need not be provided at any flat or grating level at which there is a door in a boundary of the machinery space which provides a safe escape route to the embarkation deck.

15.3.12.6 Ladders should be fixed in such a way that heat cannot, in case of a fire in the machinery space, be transferred to the ladder through non-insulated fixing points. **[unified text]**

15.3.12.7 The means of escape should be provided with emergency lighting. **[unified text]**

15.3.12.8 Each opening in the shelter should be fitted with a self-closing 'A' Class door of the same 'A' Class standard as the part of the shelter in which it is fitted. Each door should open into the shelter.

15.3.12.9 A control room situated within a machinery space should be provided with a means of escape which does not entail entering the machinery space. This may be achieved by one of the following:

- (a) direct access into the continuous fire shelter referred to in paragraph 15.3.12.1; or
- (b) direct access into an adjacent space which provides a safe escape route to the embarkation deck.

15.3.12.10 When a machinery space is recessed into or under an adjacent space and neither of the two means of escape referred to in L.S. Regulation 68(5)(a) is situated in the recess, an additional means of escape may be required to be provided from the recess. This will depend on the dimensions of the recess, the distance to the nearest escape in the main part of the machinery space and its accessibility and the location of items of machinery which may present a fire hazard.

15.3.13 Spaces in which gas cylinders are stored

15.3.13.1 A space in which gas cylinders are stored should be located preferably on an open deck or, where this is not practicable, in a 'tweendeck immediately below an open deck. Any entrance to such a space should be

from the open deck and be independent of the protected space or any other space. Every access door should open outwards.

15.3.13.2 Where such a space is located below an open deck, the access into the space should be by a companion and sloping stairway. Access in such a case should not be by means of a hatch and vertical ladder which are not considered suitable for rapid evacuation in the event of an accidental discharge of gas into the space. See paragraph 12.9.1 for the ventilation of such spaces.

15.3.14 Low location lighting (L.S. Regulation 68(7))

Proposals for compliance with the requirements for 'low location lighting' in escape routes should be presented on a plan drawn to a scale of not less than 1:100. This should show the layout and type (photo luminescent or electrically powered) of low location lighting and also the position of any symbols incorporated in the system.

15.3.15 Marking and illuminating exits and escape routes

Requirements relating to the marking and illuminating of exits and escape routes are given in L.S. Regulation 68(3) and (4). When considering those requirements the contents of the Merchant Shipping (Emergency Information for Passengers) Regulations 1990, should be observed.

15.4 Requirements Applicable to Passenger Ships of Classes II and II(A)(of 21.34 m in length and over)(L.S. Regulation 68)

The requirements which apply to passenger ships of Class I, as stated in paragraph 15.3, apply to passenger ships of Classes II and II(A) in a similar manner.

15.4.1 'Diagrammatic plan of escape routes' and 'evacuation analysis' (L.S. Regulation 68(9) and (11))

Under the requirements of L.S. Regulation 68(9) it is necessary to display a diagrammatic plan of the escape routes on Ro-Ro passenger ferries. Then under L.S. Regulation 68(11) it will become necessary to conduct an 'evacuation analysis' on such ferries which are constructed on or after 1 July 1999.

15.5 Requirements Applicable to Passenger Ships of Classes IIA (of less than 21.34 m in length) and III to VI(A) (inclusive)(SS Regulation 44)

15.5.1 On some ships the 'enclosed spaces' may cover the greater part of the length of the ship. In such cases, to facilitate the escape arrangements, it will usually be necessary to fit doors and opening windows in the sides of the enclosed spaces (these doors being additional to those normally fitted for general access purposes).

15.5.2 On ships which are primarily 'open deck' ships, with few enclosed spaces, there is a tendency in bad weather, for the passengers to crowd into these enclosed spaces. Account should therefore be taken of this tendency when considering the escape arrangements and also when assessing the degree of access available to the life saving equipment.

15.5.3 Where awnings and tie-down flexible side screens are fitted on these ships, for the protection of passengers in inclement weather, the screens must be capable of being released quickly when in the 'tied down position'. In no case should lacing be used to tie down the protective screens.

15.6 Requirements Applicable to Cargo Ships and Tankers (L.S. Regulations 84 and 101)

The following requirements, in addition to those stated in paragraph 15.2, apply to cargo ships and tankers.

15.6.1 Stairways and ladderways (L.S. Regulation 84(i)(f))

Stairways and corridors used as means of escape in spaces, other than in machinery spaces, should be not less than 700mm in clear width. Such stairways and corridors should have a handrail on one side, stairways and corridors with a clear width of at least 1800mm should have handrails on both sides. Clear width is the distance between the handrail and the bulkhead on the other side or between the handrails. The angle of inclination of stairways should be in general 45° but not greater than 50°.

15.6.2 Accommodation below the weather deck

15.6.2.1 The two means of escape from each group of accommodation spaces situated between main bulkheads below the weather deck should be stairways as widely separated as possible. One stairway should provide direct access to the embarkation deck or higher deck and the other stairway should lead to the deck over or a higher deck which provides access to the embarkation deck by means of internal stairways and/or doors in the boundaries of the deckhouses and external ladders. However, if this is not practicable, the stairway which leads to the deck over or higher deck may be replaced by a trunked vertical ladder which provides the same degree of access. (See also the Instructions to Surveyors on the application of the Merchant Shipping(Crew Accommodation) Regulations 1997, - paragraph 2.7 refers).

15.6.2.2 In certain circumstances, depending on the layout of the spaces under consideration and the position of the stairway, it may be necessary to provide two trunked vertical ladders, one port and one starboard, in order to provide adequate means of escape from the group of spaces.

15.6.3 Accommodation above the weather deck

The two means of escape from each group of accommodation spaces situated above the weather deck should be stairways as widely separated as possible. One stairway should provide direct access to the embarkation deck or higher deck and the other stairway should lead to the deck over or higher deck which provides access to the embarkation deck except that this stairway need not be fitted if there is at least one door from the corridor serving the group of spaces in each side of the deckhouse which provides access to the embarkation deck. The two doors and the stairway providing direct access to the embarkation deck should be as widely separated as possible.

15.6.4 Arrangement of doors along escape routes and accessibility of embarkation decks

15.6.4.1 The escape routes are routes for escape and also for access. Accordingly, the locking arrangements should be such that it does not obstruct these two objectives (escape and access) and that the doors in way of the escape routes can be opened from both sides.

15.6.4.2 The embarkation deck should be accessible from the open decks to which the escape routes lead.

15.6.4.3 The doors along the escape routes should not, in general, open against the escape flow. Especially, the following exceptions should be noted;

- (a) the cabin doors may, in general, open into the cabins in order to avoid damage to persons in a corridor when the door is opened; and
- (b) the doors in vertical emergency escape trunks should, in general, open out of the trunk in order to permit the trunk to be used for both escape and for access. **[unified text]**

15.6.5 Spaces in tower blocks

When crew accommodation, service spaces and control stations are arranged in a tower block with no outside decks, all tiers in the block should be connected to each other by means of external sloping ladderways with at least one access door in each tier and by an internal enclosed stairway.

15.6.6 Cargo spaces intended for the carriage of motor vehicles (L.S. Regulation 84(2))

See paragraph 15.3.10 which applies in a similar manner.

15.6.7 Machinery spaces (L.S. Regulation 84(3)(a))

See paragraph 15.3.12 which applies in a similar manner.

15.6.8 Exception of fire shelters in machinery spaces of Category A

In ships of less than 1000 tons gross, no fire shelter is required as a means of escape for machinery spaces of Category A. **[unified text]**

15.6.9 Number of escape routes from machinery spaces other than Category A

In general these machinery spaces should be provided with at least two escape routes. However, small spaces (e.g. maximum distance to the door is 5 m) or spaces which are entered only occasionally may be provided with only one escape route. **[unified text]**

15.6.10 Spaces in which gas cylinders are stored

Paragraph 15.3.12 should also apply to cargo ships and tankers. (Paragraph 14.5.18.6 which relates to the location of spaces containing the gas fire extinguishing medium for cargo spaces on cargo ships, should also be noted).

15.6.11 Number and location of escape routes in Ro-Ro Cargo spaces

The escape (and access) routes in Ro-Ro cargo spaces should be so arranged that there are adequate escape routes during both the loading and unloading process. Also at least one means of escape should be provided near the fore and aft ends of the Ro-Ro cargo spaces. **[unified text]**