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AUSTRALIAN NAVAL CLASSIFICATION AUTHORITY MANUAL (VOLUME 2)

DIVISION 3: SHIP RULES

CHAPTER 07: ESCAPE, EVACUATION AND RESCUE

PART 2: SOLUTIONS TO THE ANC RULES

This document is issued for use by Defence and Defence Industry personnel and is effective forthwith.

R Fonhof
EL2
Acting Assistant Secretary
Australian Naval Classification Authority
Department of Defence
CANBERRA ACT 2600
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Division 3: Ship Rules
Part 2: Solutions to the ANC Rules

Chapter 07: Escape, Evacuation and Rescue

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Solutions to the ANC Rules

Rule 0. Goal

0.1 Goal for this Chapter is contained in Part 1.

Rule 1. General

1.1 The Naval Vessel Operator (NVO) shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. All decisions that affect compliance with the requirements of this chapter shall be recorded at all stages from concept to disposal and these records shall be maintained throughout the life of the ship.

Solution

1.2 Application of these Solutions shall take due regard to the size and complexity of the Naval Vessel to the satisfaction of the ANC Authority.

1.3 For ships with a Post Damage Capability requirement, equipment provision and system routing may be impacted by Chapter 01 *General Requirements* Rule 2 *Post Damage Capability*.

1.4 The solutions provided in this chapter are valid only for operating environment as defined in the Life Saving Appliance (LSA) code.

1.5 All Rules, Regulations, Codes and Standards used shall be the latest versions as amended at the time of drafting the ANC Basis unless a specific version date is specified in the text.

Rule 2. Escape, Evacuation and Rescue Measures

2.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

2.2 The Escape and Evacuation measures shall be subject to an Escape and Evacuation Analysis and Escape and Evacuation Demonstration as described in Rule 3 to ensure that:

2.2.1 The Evacuation time of the undamaged Naval Vessel that carries 36 non-crew or less does not exceed 15 minutes; and

2.2.1.1 The combined Escape and Evacuation time of this undamaged Naval Vessel does not exceed:

a. 25 minutes for ships under 2000 tonnes displacement

b. 30 minutes for ships between 2000 and 8000 tonnes displacement

c. 33 minutes for ships above 8000 tonnes displacement

2.2.2 The Evacuation time of the undamaged Naval Vessel that carries more than 36 non-crew does not exceed 30 minutes, except for ships with less than two compartment damage stability criteria (see Part 3 Chapter 03 *Buoyancy and Stability* Rule 7) for which the Evacuation time does not to exceed 10 minutes; and

2.2.2.1 The combined Escape and Evacuation time of this undamaged Naval Vessel does not exceed:

a. 60 minutes for vessels with ro-ro spaces.

b. 60 minutes for vessels with less than 3 main vertical fire zones.

c. 80 minutes for all other vessels.

Note: Vessels with ro-ro spaces shall have an escape and evacuation time based on stability performance.

Rule 3. Escape and Evacuation Analysis and Demonstration

3.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

3.2 An Escape and Evacuation Analysis and an Escape and Evacuation Demonstration shall be undertaken for all ships. If substantial modifications are made to Escape, Evacuation and Rescue measures, the Escape and Evacuation Analysis and the Escape and Evacuation Demonstration shall be updated, when deemed necessary by the ANC Authority.

Escape and Evacuation Analysis

3.3 The scope and extent of the Escape and Evacuation Analysis shall be to the satisfaction of the ANC Authority, taking into account the fire and flooding hazards, the layout of the ship and the number of embarked persons as mentioned in the Operating and Support Intent (OSI).

3.4 The Escape and Evacuation Analysis shall be undertaken in accordance with IMO MSC/Circ.1533 “Revised Guidelines on evacuation analysis for new and existing passenger ships”, Annex 3 Guidelines for an advanced evacuation analysis of new and existing passenger ships, with the following adjustments:

3.4.1 Target times for escape and evacuation shall be according to Rule 2.

3.4.2 The range of watertight integrity conditions which might slow down the escape process shall be included.

3.4.3 As a minimum, six scenarios (cases 1, 2a, 2b, 3, 4a, 4b) shall be considered for the analysis as follows:

3.4.3.1 Case 1 (normal night cruising), case 2a (normal day cruising) and case 2b (action stations) in accordance with Chapter 13 of the FSS Code. The distribution of persons shall be representative for the vessel’s operations; and

3.4.3.2 Cases 3, 4a and 4b (secondary evacuation cases). In these cases, only the main vertical zone, which generates the longest travel time, is further investigated. These cases utilize the same population demographics as in case 1 (for case 3), as in case 2a (for case 4a) and as in case 2b (for case 4b). One of the two following alternatives shall be considered for case 3, case 4a and case 4b. Alternative 1 shall be considered if possible:

a. Alternative 1: One complete run of the stairways having largest capacity previously used within the identified main vertical zone is considered unavailable for the simulation; or

b. Alternative 2: 50% of the persons in one of the main vertical zones neighbouring the identified main vertical zone are forced to move into the zone and to proceed to the relevant muster station (if provided). The neighbouring zone with the largest population shall be selected.

3.4.3.3 The following additional scenarios shall be considered as appropriate:

a. Case 5 (Open deck): If an open deck is likely to be occupied by embarked persons and its gross deck surface area is larger than 400 m² or accommodates more than 200 persons, the following, additional case shall be analysed: All embarked persons are to be distributed as defined in the normal day cruising case (case 2a) considering the open deck as an additional space with an initial density of 0.5 persons/m², calculated using the gross deck surface area.

b. Case 6 (Embarkation): If separate embarkation and assembly stations are employed, an analysis of travel duration from assembly station to the entry point of the Life Saving Appliance (LSA) shall be taken into account in the process of determining embarkation and launching duration. All embarked persons are initially distributed according to the designated capacities of the assembly stations. The persons shall move to the entry point of LSA according to the procedures and designated routes. The time for boarding the LSA is determined during LSA prototype test and thus need not be addressed in detail in the simulation. However, congestion directly in front of the LSA shall be considered as part of the simulation. These congestions need to be considered as blockage or obstacle for embarked persons passing, i.e. generated with a LSA entry flow rate equal to the one observed during the LSA test.

Note: The population mix detailed in Tabel 3.1 of IMO MSC/Circ.1533 *Revised Guidelines on evacuation analysis for new and existing passenger ships*, Annex 3 may be adjusted to reflect the actual mix of embarked persons as described in the OSI.

3.4.4 Additional relevant scenarios may be considered as appropriate, in particular the ANC Authority may alter scenarios 3, 4a and 4b for vessels without distinguishable vertical zones to provide equivalent damaged scenarios.

3.5 The ANC Authority may accept the simplified Escape and Evacuation Analysis be carried out in accordance with IMO MSC/Circ.1533 Annex 2 in place of the advanced analysis where a case is made on the basis of the ship type.

Escape and Evacuation Demonstration

3.6 The calculated times shall be verified by an Escape and Evacuation Demonstration for the case which the Escape and Evacuation Analysis indicates the greatest Escape and Evacuation time. As far as reasonably practicable the Escape and Evacuation Demonstration shall reflect the Escape and Evacuation Analysis, e.g. initial number and distribution of embarked persons and the escape and evacuation procedures.

3.7 The Escape and Evacuation Demonstration shall be performed using the survival craft and exits on one side only, using the scenario, which the Escape and Evacuation Analysis indicates the greatest Escape and Evacuation time. Where these half trials are impractical, the ANC Authority may consider a partial trial using a route which the Escape and Evacuation Analysis shows to be the most critical.

Note: The ANC Authority may accept an Escape and Evacuation Demonstration for a case where the Escape and Evacuation Analysis does not indicate the greatest Escape and Evacuation time.

3.8 Parts of the Escape and Evacuation Demonstration need not be conducted for similar arrangements that have previously undergone an Escape and Evacuation Demonstration for other ships subject to the consideration of the ANC Authority.

3.9 The Escape and Evacuation Demonstration shall be carried out in controlled conditions in the following manner in compliance with the vessel's procedures for escape and evacuation:

3.9.1 The Escape and Evacuation Demonstration shall commence with the vessel afloat in harbour, in reasonably calm conditions.

3.9.2 All machinery and equipment shall be operating in normal seagoing condition.

3.9.3 All exits and doors inside the craft shall be in the same position as they are for the scenario which is being verified. If various conditions are possible, the worst-case configuration shall be used.

3.9.4 The survival craft shall be initially in their stowed positions.

3.10 The persons selected for the Escape and Evacuation Demonstration shall not have been specially drilled for such an Escape and Evacuation Demonstration other than the normal Escape and Evacuation training undertaken on board. As far as reasonably practicable, the Escape and Evacuation Demonstration shall be undertaken with a representative composition of the embarked persons in terms of physical characteristics, vessel knowledge and training.

3.11 The Escape and Evacuation Demonstration shall be carried out with due concern for the problems of mass movement or panic acceleration likely to arise in an emergency situation when rapid evacuation is necessary. The demonstrated Escape and Evacuation time shall be the time elapsed from the moment the first announcement to evacuate the vessel is given until the last person has evacuated into survival craft and the last survival craft has been moved clear from the demonstration vessel. It shall include the time for all embarked persons to don lifejackets and personal thermal protection suits, and the time necessary to launch, inflate and secure the survival craft alongside ready for evacuation.

3.12 The times recorded during an Escape and Evacuation Demonstration shall be compared to the times calculated by an Escape and Evacuation Analysis. If the recorded time is significantly larger than the calculated time and if it is not reasonable to assume that target times as given by Rule 2 shall be met, alternative Escape and Evacuation measures shall be installed and validated by an Escape and Evacuation Demonstration, until the anticipated evacuation time and Escape and Evacuation time for undamaged conditions are to the satisfaction of the ANC Authority.

Rule 4. Inspection and Maintenance

4.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

4.2 Unless expressly provided otherwise in these Rules, inspection and maintenance shall comply with:

4.2.1 ISO 15370 "Ships and marine technology – Low-location lighting on passenger ships – Arrangement", Paragraph 8.

4.2.2 IMO MSC/Circ.955 "Servicing of life-saving appliances and radio communication equipment under the harmonized system of survey and certification (HSSC)".

4.2.3 IMO MSC/Circ.1047 "Guidelines for monthly shipboard inspection of immersion suits and anti-exposure suits by ship's crews".

4.2.4 IMO MSC/Circ.849 “Guidelines for the performance, location, use and care of Emergency Escape Breathing Devices (EEBDs)”, Paragraph 5.

4.2.5 IMO Resolution A.761(18) “Recommendations on conditions for the approval of servicing stations for inflatable liferafts” as amended.

4.2.6 IMO Resolution MSC.402(96) “Requirements for maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear”.

4.3 The ANC Authority shall approve the period of acceptability of Escape, Evacuation and Rescue equipment which are subject to deterioration with age. Such Escape, Evacuation and Rescue equipment shall be marked with a means for determining their age or the date by which they shall be replaced.

4.4 Requirements for Operational readiness, maintenance and inspections of all Escape, Evacuation and Rescue arrangements and equipment for all ships shall be in accordance with SOLAS Chapter III, Part B, Regulation 20 - *Operational readiness, maintenance, and inspections*.

Note: For the purpose of this Chapter, the surveys mentioned in SOLAS are the applicable surveys that are required to maintain the ANC Record detailed in Division 1 of the ANC Rules.

4.5 Instructions for on board maintenance of all Escape, Evacuation and Rescue arrangements and equipment shall be in accordance with SOLAS Chapter III, Part B, Regulation 36 - *Instructions for on-board maintenance*, and also incorporate any additional manufacturers’ instructions.

4.6 Provision shall be made for the periodic testing of the complete Escape, Evacuation and Rescue system and shall include the testing of automatic starting arrangements:

4.7 All Evacuation and Rescue communication equipment shall be tested weekly.

4.8 Prior to undertaking work, where pyrotechnics are stowed within the Escape, Evacuation and Rescue equipment stowages, an appropriate risk assessment shall be carried out and authorised. Refer also to Chapter 10 *Dangerous Goods* Rule 13 *Special Requirements*.

4.9 Launching appliances used for purposes other than rescue and evacuation, shall be maintained, serviced, and surveyed according to the intended duty. Refer to Chapter 05 *Seamanship Systems* Rule 12 *Boat Operations* and Rule 15 *Lifting and Hoisting Appliances* for detailed requirements.

Rule 5. Availability of Escape, Evacuation and Rescue Measures

5.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

5.2 Escape, Evacuation and Rescue procedures shall ensure that whilst the ship is in-service:

5.2.1 All required Escape, Evacuation and Rescue measures are ready for immediate use.

5.2.2 Measures shall be in place to ensure all Escape, Evacuation and Rescue measures can be maintained in good condition.

5.2.3 Each embarked person is aware of duties assigned to them during the Escape, Evacuation and Rescue process.

5.2.4 All embarked persons have received basic Escape, Evacuation and Rescue training relevant to their purpose on the Naval Vessel.

5.3 Prior to sailing, it shall be verified that:

5.3.1 Escape, Evacuation and Rescue measures are adequate for the forthcoming operation, with respect to:

5.3.1.1 Number of embarked persons, their characteristics and ship knowledge.

5.3.1.2 Areas of operation, taking into account the distance to shore, climate conditions, etc.

5.3.2 Rescue craft are in a state of continuous readiness for launch in less than 5 minutes.

5.3.3 A sufficient number of skilled persons are on board to be able to conduct any task of the Escape, Evacuation and Rescue process. Every person shall be familiar with assigned Escape, Evacuation and Rescue duties before the voyage begins.

5.3.4 All embarked persons are accounted for. This information is recorded both on board and ashore and is to be readily available to search and rescue services when needed.

5.3.5 Escape routes, emergency exits, and other Escape, Evacuation and Rescue arrangements and equipment are unobstructed by fittings, furniture and other obstructions or portable equipment; and

5.3.6 Equipment on board is securely stowed for sea and nothing impinges on float free stowages.

5.4 On board procedures shall ensure that whilst at sea:

5.4.1 Escape routes, emergency exits, and other Escape, Evacuation and Rescue arrangements remain unobstructed by fittings, furniture and other obstructions or portable equipment.

5.4.2 Any equipment on board remains securely stowed for sea and nothing impinges on float free stowages.

5.4.3 Rescue craft remain in a state of continuous readiness for launch in less than 5 minutes.

5.5 The ANC Authority may require ships which are berthed or moored to comply with tailored elements of the above requirements as appropriate to the role of the ship.

Rule 6. Emergency Procedures

6.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

6.2 Escape, Evacuation and Rescue emergency procedures shall be provided which specify details of actions to be taken by embarked persons when the general emergency alarm is sounded and shall specify how the order to evacuate ship will be given. The Escape,

Evacuation and Rescue emergency procedures shall identify the duties assigned to the different members of the crew including, but not limited to:

6.2.1 Closing of watertight doors, fire doors, valves, scuppers, side scuttles, skylights, portholes, and other similar openings in the ship.

6.2.2 Equipping of survival craft and other Escape, Evacuation and Rescue equipment.

6.2.3 Preparation and launching of survival craft.

6.2.4 Preparation of other Escape, Evacuation and Rescue equipment.

6.2.5 Mustering those persons that need to be mustered.

6.2.6 Use of communication equipment.

6.3 The Escape, Evacuation and Rescue emergency procedures shall specify substitutes for key persons who may become disabled, taking into account that different emergencies may call for different actions.

6.4 The Escape, Evacuation and Rescue emergency procedures shall show the duties assigned to crew members in relation to persons who are unfamiliar to the vessel in case of an emergency. These duties shall include:

6.4.1 Warning persons who are unfamiliar to the vessel.

6.4.2 Seeing that they are suitably clad and have donned their lifejackets and personal thermal protection suits correctly.

6.4.3 Assembling persons that need to be mustered at muster stations.

6.4.4 Controlling the movements of persons unfamiliar to the vessel.

6.5 Escape, Evacuation and Rescue emergency procedures shall be prepared before the vessel proceeds to sea. If any change takes place which necessitates an alteration in the Escape, Evacuation and Rescue emergency procedures, the procedures shall be revised or new procedures shall be prepared before the vessel proceeds to sea.

6.6 The approval of the Escape, Evacuation and Rescue emergency procedures shall be based on an Escape and Evacuation Analysis and an Escape and Evacuation Demonstration (Rule 3 *Escape and Evacuation Analysis and Demonstration*).

6.7 Reporting processes shall be in place to ensure the timely flow of essential information to Command System for the management of any foreseeable combination of emergency situations. The following emergency situations shall be considered as a minimum:

6.7.1 Damage to ship, including fire.

6.7.2 Personnel, cargo, and on-board weapon related accidents.

6.7.3 Emergency assistance to other vessels.

Rule 7. Not Used

Rule 8. Provision of Operational Information

8.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

8.2 On board information relating to any Escape, Evacuation and Rescue measures shall provide adequate information, where relevant be sited at locations to facilitate Escape, Evacuation and Rescue evolutions and shall be easily understood by embarked persons. The information shall include:

8.2.1 General description of all Escape, Evacuation and Rescue measures.

8.2.2 Operational instructions of all Escape, Evacuation and Rescue measures.

8.2.3 On board training in all steps of the Escape, Evacuation and Rescue process.

8.2.4 On board inspection and maintenance of all Escape, Evacuation and Rescue measures.

8.3 Posters or signs shall be provided in conspicuous locations on or near each Escape, Evacuation and Rescue equipment and shall:

8.3.1 Illustrate the purpose of controls and procedures for operating the appliance with relevant instructions or warnings.

8.3.2 Be easily seen and understood under emergency lighting conditions.

8.3.3 Be in accordance with ISO 24409-2 “Ships and marine technology -- Design, location and use of shipboard safety signs, safety-related signs, safety notices and safety markings”; and

8.3.4 Where Escape, Evacuation and Rescue measures utilise pyrotechnics, suitable warning signage shall be provided highlighting the explosive hazard and listing mandatory safe practice.

8.4 Escape, Evacuation and Rescue plans shall be provided throughout the vessel, in conspicuous positions. They shall indicate the Escape, Evacuation and Rescue arrangements and equipment including, but not limited to, escape routes and exits, Emergency Escape Breathing Devices, muster stations (if provided), launching stations, survival craft, evacuation stations, boarding systems, lifejackets, personal thermal protection suits, stretchers, and rescue equipment.

8.5 Strategic Escape, Evacuation and Rescue positions shall in addition to Escape, Evacuation and Rescue plans, be provided with:

8.5.1 Plans indicating arrangements and operating positions of Escape, Evacuation and Rescue lighting system, Escape, Evacuation and Rescue power supply system, general emergency alarm system, any electrically powered way finding system, main broadcast system and other Escape, Evacuation and Rescue communication systems.

8.6 All accommodation spaces and muster stations (if provided) shall be provided with illustrations and instructions in appropriate languages to inform embarked persons:

8.6.1 Of the ‘You are here’ position, the escape routes and the location of muster stations (if provided) and evacuation stations. The plan on which this information is provided shall be prominently displayed and shall be properly oriented in relation to its position on the vessel.

8.6.2 Of the method of donning personal thermal protection suits and life-jackets.

8.6.3 Of the essential actions to be taken in an emergency.

8.7 The ANC Authority may require vessels carrying large numbers of Embarked Forces or on complex Naval Vessels, additional localised 'You are here' diagrams shall be displayed detailing the immediate area on the current deck and on the decks above and below, with the arrangements and equipment detailed on the plan required at paragraph 8.4.

8.8 The Naval Vessel shall be provided with an Escape, Evacuation and Rescue training manual as required by SOLAS Chapter III, Part B, Regulation 35 - *Training manual and on-board training aids*.

Rule 9. Escape, Evacuation and Rescue Equipment Stowage

9.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

General stowages

9.2 Unless expressly provided otherwise in this Rule, Escape, Evacuation and Rescue stowages shall comply with the requirements of the LSA Code.

9.3 Containers, brackets, racks and other similar stowage locations for Escape, Evacuation and Rescue equipment shall be marked in accordance with ISO 24409-2 “Ships and marine technology -- Design, location and use of shipboard safety signs, safety-related signs, safety notices and safety markings”. The symbols shall indicate the devices stowed in that location for that purpose. If more than one device is stowed in that location, the number of devices shall also be indicated.

9.4 Access space shall be arranged around the equipment stowages for inspection and maintenance, training and operating in an emergency.

9.5 Stowages shall not be located adjacent to any areas of fire or explosion hazard and shall be made of fire-retardant material.

Note: Refer to Chapter 06 *Fire Safety* for requirements regarding fire hazards.

9.6 The stowage of other Escape, Evacuation and Rescue Equipments not detailed below, shall be in accordance with their respective Rules in Rule 20, 21 and 27 of this Chapter.

External Stowages

9.7 External stowages shall remain capable of release and fulfilling their function in adverse environmental conditions including ice for the prescribed areas of operation.

9.8 External stowages shall be located in secure and sheltered positions and in particular shall:

9.8.1 Be protected from damage by heavy seas, fire and explosion.

9.8.2 Be located away from magazines and/or weapon systems, in particular ready use magazines on the upper deck.

9.8.3 Be located away from aircraft or helicopter operating areas, to minimize the effect of air blast, heat, and damage from flying operations and/or accidents or be protected from the risks associated with flying operations and/or accidents.

9.8.4 Be located away from areas subject to Radiation Hazard (RADHAZ) effects unless this can be managed to ensure the safety of personnel during use.

Note: The Naval Vessel Operator shall consider protection against external factors specific to the ship's operational role, with due consideration of Chapter 01 *Integrated Platform Survivability*.

9.9 Externally stored LSA shall be stowed in discrete stowages distributed in the longitudinal direction so as to provide maximum protection from damage.

Float free stowages

9.10 Stowages of inflatable survival craft shall have float-free arrangements which shall meet LSA Code Paragraph 4.1.6 "Float-free arrangements for liferafts". The Hydrostatic Release Unit shall be resistant to the pressure, heat and shock effects of aircraft and weapons systems.

Note: Chapter 01 *Integrated Platform Survivability* may require the stowages of lifejackets and thermal protection suits to be float free.

9.11 Float-free stowages shall be positioned so that the stored equipment will float unobstructed when released hydrostatically. Care shall be taken to ensure that they cannot snag up on superstructure, out-rigging wires, cables, aerials, or float into openings in the vessel that could trap any evacuation or rescue equipment if the vessel was sinking. Float free life rafts shall not be positioned where they are likely to be damaged by underwater fittings, such as stabilisers, during manual deployment.

9.12 Stacking of multiple units of float-free stowages is only permitted when it is assured that float-free functionality is not compromised.

9.13 Any arrangements placed to cover any float free stowages, i.e. for signature, heat, or other protection, shall not impede the float free functionality of the covered stowages.

Survival Craft

9.14 Stowage of the Survival Crafts are to be in accordance with SOLAS Chapter III, Part B, Regulation 13 - Stowage of survival craft, with the following exceptions.

9.14.1 The liferaft required by SOLAS III Reg 31.1.4 mentioned in SOLAS Regs. 13.1.5 and 13.4.4 are to be replaced with the survival craft required by ANC Rule 24.5.3.

9.14.2 SOLAS III Reg. 13.2 is to be replaced as "Lifeboats for lowering down the vessel's side shall be stowed as far forward of the propeller as practicable."

9.14.3 Davit launched survival craft shall meet the requirements of SOLAS Chapter III Regulation 24 *Stowage of Survival Craft*.

Rescue Craft

9.15 Stowage of the Rescue Crafts are to be in accordance with SOLAS Chapter III, Part B, Regulation 14 - *Stowage of rescue boats*, with the following exceptions.

9.15.1 SOLAS III Reg. 14.4 is to be replaced as "If it is also a survival craft, in compliance with the requirement of survival craft".

MES

9.16 Stowage of MES are to be in accordance with SOLAS Chapter III, Part B, Regulation 15 - Stowage of Marine Evacuation Systems (MES).

Life Jackets

9.17 To avoid damage and the possibility of premature inflation of non-vacuum packed, automatically inflatable lifejackets, the stowage shall be a compartment or store of appropriate size and properly ventilated. Space shall be left between the lifejackets for air to circulate.

Rule 10. General Emergency Alarm System

10.1 Refer to the requirements of Chapter 08 *Safety Communication* Rule 7 *Main Broadcast and Emergency Alarm System*.

Rule 11. Main Broadcast System

11.1 Refer to the requirements of Chapter 08 *Safety Communication* Rule 7 *Main Broadcast and Emergency Alarm System*.

Rule 12. On-Board Two-Way Communication

12.1 Refer to the requirements of Chapter 08 *Safety Communication* Rule 6 *Internal Communications* and Rule 8 *Portable Communications*.

Rule 13. External Communication Equipment

13.1 Refer to the requirements of Chapter 08 *Safety Communications*, in particular Rule 2 *GMDSS Equipment* and Rule 9 *Survival Craft Communication Equipment*.

Rule 14. Power Supply to Escape, Evacuation and Rescue Systems

14.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

14.2 See Chapter 04 *Engineering Systems* Rule 13 *Electrical Distribution Systems* for requirements relating to the power supply for Escape, Evacuation and Rescue systems.

14.3 Failure of any power supply to Escape, Evacuation and Rescue Systems shall provide an audible and visual alert.

Rule 15. Lighting During Escape, Evacuation and Rescue Emergencies

15.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

15.2 The following locations shall be served by escape, emergency, and rescue lighting:

15.2.1 All primary and secondary escape routes giving access to the muster stations (if provided) and evacuation stations.

15.2.2 All muster stations (if provided).

15.2.3 All launching stations, including survival craft, its launching appliances, and the area of water into which it is to be launched.

15.2.4 All evacuation stations, both at the station and at the survival craft in the water.

15.2.5 Machinery spaces and workshops so that embarked persons do not come into contact with moving machinery.

15.2.6 Exits from galleys and associated areas to clearly define the nearest escape route, avoiding hot equipment.

15.2.7 Additional locations as deemed necessary by the ANC Authority.

15.3 An extra means of illumination shall be provided for the event of a failure of all primary and secondary lighting and shall:

15.3.1 Operate automatically from a self-contained power source on failure of the primary and secondary lighting systems.

15.3.2 Operate for a period of at least four hours.

15.3.3 Be mounted such that the light source is at least 1.25m but not more than 1.5m above the deck.

15.3.4 Be provided in the following locations to indicate exit routes from enclosed spaces to the Weather deck, muster station (if provided) or evacuation stations:

15.3.4.1 Passageways and normally occupied compartments.

15.3.4.2 Machinery spaces and workshops so that personnel do not come into contact with moving machinery.

15.3.4.3 At exits from Galleys and associated areas to clearly define the nearest escape route, avoiding hot equipment.

15.4 Escape, Evacuation and Rescue emergency lights (including those installed as an extra means of illumination as required by paragraph 15.3) shall be switched on automatically in the case of emergency or power failure, except for the following cases:

15.4.1 Lights that may be seen from any location outside the vessel.

15.4.2 Lights which may interfere with the maintenance of lookout or the conduct of safe navigation.

15.5 In the cases listed in paragraph 15.4, the installation shall be suitably screened, or it shall be possible to manually switch on such lights locally and where possible, from agreed control stations. The switches shall be clearly marked and readily recognised.

Note: Lights listed in paragraph 15.4.1 and 15.4.2 be default to ON and can only be switched to OFF when required for operational purposes.

Note: See Chapter 04 *Engineering Systems* Rule 14 *Lighting System* for requirements relating to lighting for Escape, Evacuation and Rescue systems.

Rule 16. Escape Routes and Escape Exits

16.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

16.2 Unless expressly provided otherwise in this Rule:

16.2.1 At least two exits shall be provided from all routinely occupied spaces or group of adjoining spaces to the muster stations (if provided) and evacuation stations, as widely separated as possible.

16.2.2 Where spaces are grouped, a justification for any spaces that are considered to be grouped and the level of escape provision related to the planned occupancy and duration shall be provided to the ANC Authority for approval.

16.2.3 A corridor, lobby, or part of a corridor from which there is only one route of escape shall be prohibited.

16.2.4 At least one means of escape from each main vertical zone, watertight compartments or similarly restricted space or group of spaces shall provide vertical escape.

16.2.5 The ANC Authority may under Chapter 03 *Buoyancy and Stability* Rule 2 exceptionally allow passage through the main subdivision compartment below the submergence limit. In such cases at least one of the means of escape shall be independent of openings in watertight bulkheads forming the boundaries of main subdivision compartments.

16.2.6 Lifts are not to be considered as forming one of the escape routes.

16.2.7 Where enclosed spaces adjoin an open deck, openings from the enclosed space to the open deck shall, where practicable, be capable of being used as an emergency exit.

16.3 The ANC Authority may dispense with one of the exits for:

16.3.1 Compartments other than machinery and steering gear spaces with a travel distance lower than 7 metres.

16.3.2 Machinery spaces with a travel distance lower than 5 metres.

16.3.3 Steering gear spaces with a travel distance lower than 7 metres and with direct access to the open deck.

16.3.4 Dead-end passageways with a travel distance lower than 7 metres.

16.3.5 Dead-end corridors used in service areas which are necessary for the practical utility of the vessel, such as oil fuel stations and athwartships supply corridors, shall be permitted, provided such dead-end corridors are separated from any accommodation area and are entered only occasionally.

16.4 A part of a corridor that has a depth not exceeding its width is considered a recess or local extension and is permitted.

16.5 When a single means of escape is accepted, the following applies:

16.5.1 The single means of escape shall comply with the requirement of a primary escape route.

16.5.2 The single means of escape shall be independent of openings in watertight bulkheads forming the boundaries of main subdivision compartments.

16.6 Within each main vertical fire zone (according to Chapter 06 *Fire Safety*) where more than 50 embarked persons are present at any time, enclosed stairways shall be provided as a primary escape route. These enclosed stairways shall:

16.6.1 Be free of internal arrangements, equipment or stores which may contain fire risks.

16.6.2 Only be entered from areas with a low fire risk or by small passageways or airlocks which separate the enclosed stairway from high fire risk areas (e.g. galleys, laundries or machinery spaces). These passageways or airlocks shall have a minimum deck area of 4.5 m2, a width of no less than 900 mm.

16.7 For all escape routes, the following applies:

16.7.1 Unless specifically stated otherwise by these Rules, all items and equipment along escape routes shall be secured in place to prevent shifting if the ship rolls or lists. Floor coverings shall also be secured in place.

16.7.2 Primary escape routes ending in deck areas where vehicles/aircraft or stores are manoeuvred or stored (e.g. hangars, vehicle decks, flight decks, stores) shall be protected from obstruction. In such cases, the secondary escape route shall avoid direct access to this. Parking arrangements for vehicles on board shall maintain escape routes clear at all times.

16.7.3 There shall be no protrusions or obstructions in escape routes which could cause injury or ensnare clothing, life-jackets or personal thermal protection suits. Machinery, piping, operating rods, brackets, trolley tracks, and other items that restrict passage or are a source of danger to embarked persons shall be kept clear of escape routes. Where such installations cannot be avoided, guards or protective padding shall be provided.

16.7.4 Wherever possible stiffeners, including swedges, shall be fitted on the reverse side of bulkheads forming main passageways. Where this is impossible, then the declared design clear widths shall be maintained. Also, where it is essential to site items of equipment along escape routes, the declared design clear widths shall be maintained in way of this equipment.

16.7.5 There shall not be any doors, hatches or similar along any escape route that require keys, codes or similar security to unlock them when moving in the direction of escape.

16.8 Additionally, for internal escape routes, the following applies:

16.8.1 Emergency Escape Breathing Devices shall be provided to protect embarked persons from hazardous atmosphere during escape, as required by Rule 20 *Emergency Escape Breathing Devices*.

16.9 Additionally, for external escape routes, the following applies:

16.9.1 Protection shall be offered from green water.

16.9.2 Slip free surface shall be provided along the entire external escape route.

16.10 Additionally, for primary escape routes, the following applies:

16.10.1 The primary escape route shall be readily accessible and shall allow for the passage of stretchers. Primary escape routes shall provide a continuous fire shelter from the level of its origin to the evacuation station.

16.10.2 Primary escape routes via high-risk compartments (e.g. machinery spaces, High Voltage compartments, hangars, vehicle decks), shall, as far as practicable, be avoided. When such escape routes are accepted, a secondary escape route shall be provided which does not lead through that compartment.

16.10.3 It shall not be necessary to cross from one side of the vessel to the other to follow a primary escape route.

16.10.4 The primary escape route from cabins and mess decks shall be as direct as possible, with a minimum number of changes in direction.

16.10.5 The minimum clear width of stairways, ladders and passageways of primary escape routes shall not be less than 900 mm and shall not be inferior to those determined by the calculation method provided within the FSS Code Chapter 13 Paragraphs 2.1.2 and 2.3 or as proved necessary by Escape and Evacuation Analysis (Rule 3).

16.10.6 A minimum clear height of 2000 mm shall be provided along primary escape routes.

16.10.7 Hazards such as hatches sited at or adjacent to the foot of a stairway, ladder or door shall be avoided on primary escape routes.

16.10.8 For vessels with spaces that are not normally subdivided in any way and extend to either a substantial length or the entire length of the vessel, the lowest 0.5 metres of bulkheads and other partitions forming vertical divisions along primary escape routes shall be able to sustain a load of 750 N/m2 to allow them to be used as walking surfaces from the side of the escape route with the vessel at large angles of heel.

16.11 Additionally, for secondary escape routes, the following applies:

16.11.1 The secondary escape route shall, as far as practicable, provide an escape performance equivalent to the primary.

16.11.2 The secondary escape route shall, wherever practicable, lead to a different compartment or passageway from the primary escape route. Where possible this compartment shall also be independent of ventilation serving the primary escape route.

16.12 For local means of escape, the following applies:

16.12.1 Compartments normally occupied shall not require keys, codes or similar security to unlock them from inside the room (e.g. secure compartments, stores).

16.12.2 Compartments subject to Controlled Access restrictions due to security requirements such that there may be persons inside with the door locked shall put in place arrangements and procedures to ensure that escape can be affected from the compartment.

16.12.3 For machinery spaces which contain internal combustion machinery used for main propulsion, internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW, any oil-fired boiler or oil fuel unit or units with similar fire risks, the two means of escape shall be arranged by:

16.12.3.1 Two sets of steel (or equivalent fire-resistant material) ladders as widely separated as possible leading to doors in the upper part of the space similarly separated and from which a primary or secondary escape route can be accessed. One of these ladders shall be an enclosed escape route that satisfies Chapter 06 Fire Safety, from the lower part of the space it serves. Self-closing fire doors of the same fire integrity standards shall be fitted in the enclosure. The ladder shall be fixed in such a way that heat is not transferred into the enclosure through non-insulated fixing points. The enclosure shall have minimum internal dimensions of at least 800 mm x 800 mm, and shall have emergency lighting provisions; or

16.12.3.2 One steel (or equivalent fire-resistant material) ladder leading to an approved fire door in the upper part of the space and, additionally, in the lower part of the space and in a position well separated from the ladder referred to, an approved fire door capable of being operated from each side. The steel (or equivalent fire-resistant material) ladder and the approved fire door shall provide access to a primary or secondary escape route.

16.12.3.3 Two means of escape shall be provided from machinery control rooms and workshops located within a machinery space. At least one of these escape routes shall provide a continuous fire shelter to a safe position outside the machinery space.

16.12.3.4 Floorplate passageways shall be fitted in machinery compartments to provide platforms and walkways as required so that persons working in these compartments can readily escape. The area of platforms shall be the minimum practicable for the intended purpose and to provide the greatest unimpeded escape.

Note: While considering this paragraph, Chapter 06 *Fire Safety* Rule 2.21 *Structural Integrity in case of fire* is to be considered.

Rule 17. Fixtures and Fittings on Escape Routes

17.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

17.2 All fixtures and fittings on escape routes and of escape exits shall be non-flammable or have equivalent fire resistance to the satisfaction of the ANC Authority.

17.3 Hatches, doors, stairways, ladders, scuttles, and panels shall:

17.3.1 Be clearly and permanently marked for identification and operation.

17.3.2 Be capable of being opened rapidly by one person in the direction of escape, whereby the means of operation is obvious, in daylight and in darkness.

17.3.3 Unless specifically stated otherwise in this Rule, open in-way of the direction of escape.

17.4 Doors, hatches, scuttles, and panels shall be capable of being readily operated from inside and outside the ship by one person.

17.5 Where any additional equipment is required to achieve operation, this equipment must be readily identifiable and fitted immediately adjacent to the respective door or hatch. Where it is not possible to fit this immediately adjacent to the opening, it shall be located as close as

possible, and signage provided adjacent to the opening to indicate the location of the additional equipment.

17.6 Doors, hatches, scuttles, or panels shall be able to be operated independent of any ship's power supply.

Handrails and handholds on escape routes

17.7 Along the primary escape route, both internal and external, handrails or other handholds shall be provided whenever necessary to assist embarked persons to the evacuation station. These handholds shall be suitable when the vessel has developed the anticipated angles of list or trim for damaged conditions. Handrails shall be provided as follows:

17.7.1 On one side on escape routes with a clear width under 1800 mm and on both sides on escape routes with a clear width of 1800 mm and over.

17.7.2 For vessels with spaces that are not normally subdivided in any way and extend to either a substantial length or the entire length of the vessel, handrails shall be provided on both sides of longitudinal corridors more than 1.8 metres in width and transverse corridors more than 1 metre in width. Handrails and other handholds shall be of such strength as to withstand a distributed horizontal load of 750 N/m applied in the direction of the centre of the corridor or space, and a distributed vertical load of 750 N/m applied in the downward direction. The two loads need not be applied simultaneously.

Escape doors

17.8 Doors in primary and secondary escape routes shall be operable from both sides and in general, open in-way of the direction of escape, except where the door of a compartment would open into a major escape route, thus impeding the flow of other embarked persons. These doors shall not require keys, codes or similar security to unlock them. Doors in vertical emergency escape trunks may open out of the trunk in order to permit the trunk to be used both for escape and for access.

17.9 Securing arrangements shall be provided to retain doors in the open position. These shall be sufficiently robust to ensure that the door remains secure against heavy sea motions of rolling and pitching and transmitted shock forces.

Note: Refer to the requirements of Chapter 06 *Fire Safety* Rule 8 *Containment of Fire* Rule 8.32 *Manual doors in fire resisting divisions* and 8.110 *Doors and Hatches* for hold-back arrangements.

17.10 Escape doors with weight in excess of 50 kg shall be fitted with a mechanical means of operation sufficient to ensure that they can be opened or closed against an adverse trim or heel.

17.11 Non-watertight doors to living and working compartments shall be fitted with kick-out panels.

Escape stairways and ladders

17.12 The following stairways and ladders shall be fitted for escape purposes and shall serve all hatches and scuttles which are part of primary or secondary escape routes:

17.12.1 Stairways – on primary and secondary escape routes.

17.12.2 Ladders (including step type ladders) – on primary and secondary escape routes for crew spaces that are entered only occasionally.

17.12.3 Flexible emergency ladders – on secondary escape routes only, for crew spaces that are entered only occasionally. The ladders shall be permanently rigged at the deck head, and where possible, anchored to the deck at all times. The arrangements and location shall be approved by the ANC Authority.

Note: Refer to the requirements in Chapter 03 *Buoyancy and Stability* Rule 6 *Safety of Embarked Persons and Seakeeping* for requirements relating to stairs and ladders.

17.13 Escape stairways and ladders shall be arranged fore and aft and sited clear of through passageways.

17.14 Escape stairways and ladders shall not exceed 3.5 metres in vertical rise without the provision of a landing. Landings shall also be provided at the top and bottom of each stairway or ladder on the primary escape routes. The area of these spaces shall not be less than 2 m^2 and shall increase by 1 m^2 for every 10 persons anticipated to use that stairway or ladder in excess of 20 persons but need not exceed 16 m^2.

17.15 All ladders and stairways provided for escape in the machinery room shall be fitted with steel shields attached to their undersides, such as to provide escaping personnel protection against heat and flame from beneath.

Escape hatches

17.16 Hatches shall be operable from above and below by one person. The maximum force needed to open the hatch cover should not exceed 150 N. This may require additional counterbalance units, power assistance systems, or escape manholes to be incorporated into larger hatches.

17.17 Hatches shall have a minimum clear opening area of 550 mm x 550 mm and be of sufficient size to allow for the passage of persons wearing personal protective equipment.

17.18 All hatches shall be provided with securing arrangements to retain hatches in the open position. These shall be sufficiently robust to ensure that the hatch remains secure against heavy sea motions of rolling and pitching and transmitted shock forces. Where hatches are adjacent to bulkheads, the cover shall hinge against the bulkhead. The hatch shall be hinged such that the clip can be released or shut without reaching across the opening. The arrangements for securing the hatch in the open position shall be in such a position that it is clearly visible to persons using the hatch.

17.19 Where practical, hatch covers shall be hinged on the forward or after side.

17.20 Flush type hatches shall not be installed in decks of wet spaces. Raised hatches or manholes shall be installed only where they do not impose a tripping hazard.

Escape panels or scuttles

17.21 Where a secondary means of escape is required but cannot otherwise be provided by a door or hatch, an escape panel or scuttle shall be installed.

17.22 Escape panels shall have a minimum clear opening area of 550 mm x 550 mm and escape scuttles a minimum diameter of 610 mm. Furthermore, they shall allow easy passage of persons wearing personal protective equipment.

17.23 Escape scuttles shall not be installed in decks at locations which would impede escape in the passageway along that deck.

Rule 18. Way Finding System

18.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

18.2 Internal and external escape routes and exits shall be clearly and permanently marked. The marking shall enable embarked persons to readily identify the routes of escape and escape exits from normally occupied compartments via the muster station (if provided) until the evacuation station is reached. Markings shall be provided at all points of the escape route, including angles, intersections and exits.

18.3 The ANC Authority may require that consideration also be given to markings for evacuation when the vessel is alongside, and standard evacuation stations may not be usable.

General

18.4 The way finding systems shall comply with ISO 15370 *Ships and marine technology – Low-location lighting on passenger ships – Arrangement*.

18.5 All way-finding markings on internal escape routes are to be placed not more than 300 mm above the deck in order to remain visible in the event of smoke at all points of the escape route including angles, intersections and exits.

18.6 Additional directional arrows and exit signs shall be positioned on internal escape routes:

18.6.1 At a nominal height of 1500 mm above the deck in order to remain visible from any position in the compartment.

18.6.2 In the centre of passageways adjacent to bulkhead mounted markings in order to remain visible in the event of smoke.

18.7 Way-finding markings shall be placed such that they cannot be obscured by doors or hatches in the open position.

18.8 For escape routes, which are normally supplied by red light, the effectiveness of the way-finding system shall be demonstrated to the satisfaction of the ANC Authority.

18.9 Exit signs shall be provided adjacent to all doors and all escape hatches in the direction of the primary escape route.

18.10 Emergency exit signs shall be provided adjacent to all doors and all escape hatches in the direction of the secondary escape route.

Note: Exit and emergency exit signs can be placed on doors or on escape hatch where there is insufficient space adjacent to the door.

Photo-luminescent Signs

18.11 Phosphorescent (PL) materials shall provide a luminance of at least 15 mcd/m^2 measured 10 minutes after the removal of all external illuminating sources. The system shall continue to provide luminance values greater than 2 mcd/m^2 for 60 min after the removal of the ambient emergency light source illuminating for duration of 5 hours. The luminance shall be measured at the surface of the materials.

18.12 Where adhesives are used for the system signage and markings, the adhesion shall be suitable for the foreseeable environmental operational conditions (e.g. presence of heating in

galleys, water within heads and bathrooms, oils/greases etc) and shall be approved by the ANC Authority.

18.13 Directional arrows sign on the escape routes shall have the maximum spacing of no greater than 5m.

18.14 Photo-luminescent hazard strip signs shall be provided on the leading edge of equipment or containers that protrude greater than 300mm from the bulkhead.

18.15 Photo-luminescent hazard strip signs shall be provided on the edge of deviations in floor height.

18.16 Photo-luminescent hazard strips signs shall be installed on all ladder rungs.

18.17 Photo-luminescent equipment signs for life saving equipment shall be mounted on or near the equipment.

Electrically powered systems

18.18 When Electrically Powered way-finding systems are installed, it shall:

18.19 Be provided with electrical power supplies as stated in Rule 14 *Power Supply to Escape, Evacuation and Rescue Systems*.

18.20 Be capable of being manually activated by a single action from a continuously manned central control station. Additionally, it may start automatically in the presence of smoke.

Other

18.21 If provided, Electrically Powered Directional Sound or alternative guidance system shall be approved by the ANC Authority based on compliance with IMO MSC/Circ.1167 'Functional Requirements and Performance Standards for the Assessment of Evacuation Guidance Systems' and IMO MSC/Circ.1168 'Interim Guidelines for the Testing, Approval and Maintenance of Evacuation Guidance Systems used as an Alternative to Low-Location Lighting Systems'.

18.22 The functionality of each escape way-finding system shall be demonstrated by practical tests to the satisfaction of the ANC Authority.

Rule 19. Muster Station

19.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

19.2 Muster stations shall be provided for all Naval Vessels. An alternative muster station shall be nominated in event of the main muster station becoming unavailable.

19.3 The muster station may coincide with the evacuation station, provided there is sufficient room, and the assembly activities can safely take place concurrently with evacuation activities. Otherwise, muster stations shall be arranged, in the vicinity of, and permit ready escape for the assembled persons to the evacuation stations.

19.4 Each muster station shall have sufficient clear deck space to accommodate all persons assigned to muster at that station, but at least 0.35 m2 per person.

19.5 Muster stations shall be positioned to reduce risk from fire, smoke, and hazardous vapour.

19.6 Additionally muster stations shall be operational in case of flooding, taking into account anticipated list or trim for damaged conditions. The muster station shall be positioned above the damaged waterline and contain provision for draining down of water.

19.7 Muster station escape routes shall have similar characteristics as required for primary escape routes (see Rule 16 *Escape Routes and Escape Exits*).

19.8 The muster station and the escape route to the evacuation station provides the maximum protection to the persons located within from:

19.8.1 External influences such as wash or green water.

19.8.2 Vessel's weapon and sensor systems.

19.8.3 Fire, smoke and hazardous vapours.

19.8.4 RADHAZ.

Rule 20. Emergency Escape Breathing Devices

20.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

20.2 Unless expressly provided otherwise in these Rules, Emergency Escape Breathing Devices shall comply with the FSS Code.

Note: Any solutions proposed to meet specific ADF service requirements that deviate from the Standards prescribed in this Rule shall be submitted with proper justification to the ANC Authority for approval.

20.3 The maximum time to escape from any compartment to an area of relative safety shall be verified by an Escape and Evacuation Analysis and an Escape and Evacuation Demonstration (see Rule 3 *Escape and Evacuation Analysis and Demonstration*). If it is not reasonable to assume that this time is within 10 minutes, the minimum service duration of the Emergency Escape Breathing Device (EEBD) as stipulated by the FSS Code shall be increased accordingly.

20.4 The vessel shall carry at least a number of EEBDs equivalent to 150% of the total number of crew members. Additional provision of EEBDs for other embarked persons shall be as defined in the OSI.

20.5 The distribution of EEBDs on board shall be approved by the ANC Authority. As a minimum, EEBDs shall be provided along each primary escape route, adjacent to normally occupied compartments. Furthermore, the distribution shall reflect:

20.5.1 Anticipated distribution of embarked persons during sea watch, defence watch and action stations.

20.5.2 Risks of hazardous atmosphere throughout the vessel.

20.5.3 Risk of entrapment (e.g. machinery spaces).

20.6 EEBDs shall be situated ready for use at easily visible and accessible places. EEBDs shall be reached quickly and easily at any time in the event of fire, darkness or smoke-filled environment (e.g. closer to the deck than the deckhead).

Rule 21. Incapacitated Persons

21.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

21.2 Naval Vessels shall carry at least a number of stretchers equivalent to 5% of the total number of embarked persons.

21.3 The chosen stretchers shall reflect the physical constraints on board and shall enable the carriage of personnel in both a horizontal and a vertical position. Consideration shall be given to ensuring that the stretchers can be used within the confined spaces of the vessel.

21.4 The chosen stretchers shall allow the wounded person to be lifted vertically with the stretcher either vertical or horizontal.

21.5 Stretchers shall be distributed around the ship and shall reflect the degree of difficulty of recovering incapacitated persons.

21.6 Stretchers shall be located and stowed to ensure availability for immediate use.

21.7 Stowage arrangements (fittings and fixtures) of Stretchers shall be in accordance with Chapter 15 *Health Facilities* Rule 3 *Casualty First Response Facilities*.

Rule 22. Launching and Embarkation Arrangements

22.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

22.2 Launching and embarkation arrangements shall:

22.2.1 Be readily and safely accessed from normally occupied compartments and provide ease of escape to embarkation stations as far as practicable, which shall be verified by an Escape and Evacuation Analysis and an Escape and Evacuation Demonstration (Rule 3 *Escape and Evacuation Analysis and Demonstration*). These routes shall have similar characteristics as required for primary escape routes (Rule 16 *Escape Routes and Escape Exits*).

22.2.2 Meet the requirements of SOLAS Chapter III Regulation 12 *Launching stations*.

22.2.3 Be always capable of safe and efficient operation in conditions of trim of up to 10° and list of up to 20° either way.

Note: If the worst trim and heel conditions are greater than above, the NVO shall propose a solution to ensure safe and efficient operation.

22.2.4 Not interfere with the prompt preparation, handling and launching of any survival craft at any other station.

22.2.5 Where there is a danger of survival and rescue craft being damaged by the vessel's stabiliser wings, means shall be available, powered by an emergency source of energy, to bring the stabiliser wings in board; indicators operated by an emergency source of energy shall be available on the bridge to show the position of the stabiliser wings.

22.2.6 Be positioned to avoid ship sides openings, projections or discharge points between the embarkation station and the waterline in the lightest seagoing condition.

22.2.7 Have sufficient clear deck space to ensure free passage of persons to it.

22.2.8 Be so arranged as to enable stretchers to be placed in survival craft.

Note: Launching and Embarkation station may require additional workspace for providing first aid. Refer to Chapter 15 *Health Facilities*.

22.2.9 As minimum have at least one launching station and embarkation station on each side of the vessel and they shall be equally distributed as far as practicable.

22.2.10 Be provided with handholds, anti-skid treatment of the deck and adequate space, which is clear of cleats, bollards and similar fittings.

22.2.11 Davit launched survival and Rescue craft embarkation arrangements shall meet the requirements of SOLAS Chapter III Regulation 23 *Survival craft and rescue boat embarkation arrangements*.

22.2.12 For rescue craft, allow for safe and efficient handling of a stretcher. Foul weather recovery strops shall be provided if heavy fall blocks constitute a danger.

22.3 The launching and/or embarkation stations shall:

22.3.1 Be positioned as close as possible to the muster station (if provided), the stowage position of its survival and rescue craft, and comply with the location requirement for external stowages in Rule 9 *Escape, Evacuation and Rescue Equipment Stowage*.

22.3.2 Be positioned such that the survival or rescue craft can be safely launched in a simple manner and remain secured to the vessel during the embarkation procedure.

22.4 Launching stations shall:

22.4.1 Be positioned to enable the survival or rescue craft to be launched and lowered to sea level (and recovered where necessary) in full view of its operator at all times.

22.4.2 Be as near the water surface as is safe and practicable.

22.5 Embarkation stations shall:

22.5.1 For vessels with lifeboats, be such that the lifeboats can be boarded prior to launching.

22.6 Launching equipment shall:

22.6.1 Comply with the LSA Code Paragraph 6.1 "Launching and Embarkation appliances".

22.6.2 Be able to deliver survival craft from the stowed position to the sea surface and enable boarding from the embarkation station where required.

22.6.3 Only one type of release mechanism shall be used for similar craft carried on board the vessel.

22.6.4 For rescue craft:

22.6.4.1 Enable launching the rescue craft, where necessary utilizing painters, with the vessel making headway at speeds up to 5 knots in calm weather.

22.6.4.2 Ensure that neither the launching nor the recovery time of the rescue craft shall be more than 5 minutes in moderate sea conditions when loaded with its full complement of persons and equipment. If the rescue craft is also a survival craft, this recovery time shall be possible when loaded with its survival craft equipment and the approved rescue craft complement of at least six persons.

22.6.5 Where falls are used, be long enough for the survival craft to reach the water with the vessel in its lightest seagoing condition, taking into account the anticipated list and trim for damaged conditions as defined in Chapter 3 *Buoyancy and Stability*.

22.6.6 Be provided for survival and rescue craft which have a mass of more than 185 kg and for liferafts which cannot be launched directly from the stowed position under the anticipated trim and heel in damaged conditions.

22.6.7 Where partially enclosed lifeboats are fitted, be provided with a davit span fitted with not less than two lifelines of sufficient length to reach the water with the vessel in its lightest seagoing condition, under conditions of list and trim for damaged conditions.

22.7 Embarkation equipment shall:

22.7.1 Unless expressly provided otherwise in these Rules, boarding equipment shall comply with LSA Code Paragraph 6.1.6 “Embarkation ladders” and Paragraph 6.2 “Marine evacuation systems”.

22.7.2 Provide at least two boarding systems on each side of the ship and these may take the form of climbing nets, embarkation ladders, MES, or similar systems. Where vessels carry a climbing net and an embarkation ladder:

22.7.2.1 They shall be provided on each side in a single length from the deck to the waterline in the lightest seagoing condition under the anticipated list or trim for damaged conditions.

22.7.2.2 They shall be ready for deployment and along the length of the vessel there shall be a sufficient number of securing points available for their attachment. These securing points need not be dedicated for use of the climbing nets or embarkation ladders and may be existing structure serving another purpose.

22.7.2.3 they shall be suitable for the hull shape of the location where they are fitted.

Note: Boarding systems shall be sufficient in number to ensure the maximum times for evacuation as prescribed in Rule 2 *Escape, Evacuation and Rescue Measures* are not exceeded.

22.7.3 When boarding is conducted after launching, means shall be provided for bringing survival craft against the vessel’s side and holding them alongside so that persons can safely embark.

Rule 23. Not Used

Rule 24. Survival Craft

24.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

24.2 Unless expressly provided otherwise in these Rules:

24.2.1 Survival craft shall comply with LSA Code, Chapter 4 “Survival craft”.

24.2.2 Liferafts shall be automatically self-righting or canopied reversible liferafts in accordance with IMO MSC/Circ.809 “Recommendation for Canopied Reversible Liferafts, Automatically Self-righting Liferafts and Fast Rescue Boats, including testing, on Ro-Ro passenger ships”.

Note: Any solutions proposed to meet specific ADF service requirements that deviate from the Standards prescribed in this Rule shall be submitted with proper justification to the ANC Authority for approval.

24.3 Equipment to be brought into survival crafts, such as VHF radios and transponders, shall be stored in positions where they can be rapidly placed in any one of the survival crafts. Equipment shall be transported in containers or bags of a watertight and floating type.

24.4 Survival craft shall be carried to accommodate not less than 125% of the total number of persons the vessel is certified to carry, subject to a minimum of two such survival craft being carried.

24.5 Additional survival craft shall be carried such in that at least 110% capacity shall remain available in the event that all the survival craft on either side of the vessel’s centreline within the longitudinal extent of damage (defined in the OSI) are considered lost or rendered unserviceable.

24.6 Survival craft mentioned in 24.4 and 24.5 shall be Marine Evacuation Systems complying with LSA Code, Section 6.2 *Marine Evacuation Systems* where the ship is designed to carry a non-crew complement of 100 persons or more, or if the ship is designed to operate in ocean waters below 10 degrees Celsius.

24.7 Survival craft mentioned in 24.4 and 24.5 shall be totally enclosed lifeboats complying with the requirements of section 4.6 of the LSA Code for ships with the Special Function of Bulk Fuel Carriage.

24.8 Vessels where the horizontal distance from the extreme end of the stem or stern of the vessel to the nearest end of the closest survival craft is more than 100 metres shall additionally carry a liferaft stowed as far forward or aft, or one as far forward and another as far aft, as is reasonable and practicable. Such liferaft or liferafts may be securely fastened so as to permit manual release and need not be of the type which can be launched from an approved launching device.

24.9 A rescue craft may be included in the survival craft capacity, providing it complies with the requirements of survival craft.

Note: Rescue craft shall meet the requirements of Rule 27 *Rescue Arrangements* paragraphs 27.2 - 27.7.

24.10 A marine evacuation system (MES) complying with LSA Code, Section 6.2 “Marine Evacuation Systems” may be substituted for the equivalent capacity of liferafts and launching equipment as required by this Rule and Rule 22 Launching and Embarkation Arrangements.

24.11 Survival craft shall be distributed in such a manner that there is an equal capacity on both sides of the vessel.

24.12 Survival craft stowages shall be located as close to evacuation stations as possible.

24.13 The length of the securing lines and the arrangements of the bowsing lines shall be such so as to maintain the survival craft suitably positioned for evacuation. The securing arrangements for all securing and bowsing lines shall be of sufficient strength to hold the survival craft in position during the evacuation process.

24.14 For ships equipped with survival craft which are not self-propelled, the following applies:

24.14.1 The vessel shall carry sufficient rescue craft to ensure that, in providing for abandonment by the total number of embarked persons the vessel is certified to carry:

24.14.1.1 Not more than nine survival craft are marshalled by each rescue craft: or

24.14.1.2 If the ANC Authority is satisfied that the rescue craft are capable of towing a pair of such survival craft simultaneously, not more than twelve survival craft are marshalled by each rescue craft: or

24.14.1.3 If it is demonstrated that the complete evacuation process from launching and boarding until all survival craft are cleared from the damaged vessel, are within the requirements of Rule 2 *Escape, Evacuation and Rescue Measures*.

Note: If a pair of survival craft are to be towed simultaneously in accordance with paragraph 24.14.1.2, the survival craft shall be of a design that enables them to be towed simultaneously.

24.14.2 Ships with more than 450 non-crew shall carry at least two rescue craft.

24.14.3 The ANC Authority may permit craft carried for operational purposes to replace some of the rescue craft allocated to the marshalling of survival craft providing that:

24.14.3.1 the requirements of paragraph 24.14.1.3 are met.

24.14.3.2 the craft have sufficient mobility and manoeuvrability in a seaway to marshal survival craft and safely tow the largest survival craft carried on the vessel when loaded with its full complement of persons and equipment.

24.14.3.3 in all operational scenarios, sufficient craft are available to marshal all deployed survival craft that are not self-propelled.

24.14.3.4 in all operational scenarios, sufficient rescue craft are available.

Note: At least one rescue craft is required in accordance with Rule 27, paragraphs 27.2 - 27.7.

24.14.4 Where a single rescue craft is used for marshalling, it is to be arranged so that it can be launched from either side of the ship.

24.14.5 When more than one craft is fitted to marshal survival craft, at least one craft shall be fitted on each side of the ship.

Rule 25. Lifejackets

25.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

25.2 Unless expressly approved by the ANC Authority, lifejackets shall comply with LSA Code Paragraph 2.2 “Lifejackets”.

Note: Any solutions proposed to meet specific ADF service requirements that deviate from the Standards prescribed in this Rule shall be submitted with proper justification to the ANC Authority for approval.

25.3 Lifejackets shall be provided to accommodate the full range of physical characteristics of embarked persons.

25.4 Lifejackets shall incorporate a screen to provide protection from waves and sea-spray to the person overboard.

25.5 The lifejackets shall not impede entry into the survival craft or interfere with occupant safety or operation of the survival craft. Where a MES is provided, compatibility shall be proven.

25.6 For special purposes, alternative colours and retro-reflective material arrangements on the lifejackets may be approved by the ANC Authority. The inflated part shall, however, always comply with the colour and retro-reflective material requirements stated in the LSA Code.

25.7 Life jackets shall either be:

25.7.1 Issued individually to every embarked person. Additional lifejackets shall also be carried for 10% of the number of embarked persons and stowed in at least two separated, conspicuous, readily accessible places as near as practicable to the evacuation stations.

25.7.2 Alternatively, stowed in at least two separated, conspicuous, readily accessible clusters in different main fire zones as near as practicable to the evacuation stations. The number of lifejackets stored per cluster shall be at least 110% of the total number of persons assigned to the survival craft served by that evacuation station. Clustered lifejackets shall be stowed so that their distribution and donning does not impede any other escape or evacuation activity.

25.7.3 The total number and distribution of life jackets shall ensure sufficient numbers remain in the event of the loss of a "cluster" of stowages and include consideration of the loss of stowages in abandonment scenarios.

25.8 Additionally, a sufficient number of lifejackets shall be carried for persons on watch. The number of the lifejackets carried for this reason shall equal the number of people ordinarily on watch and shall be stowed on the bridge, in the engine control room and at any other manned watch station.

25.9 Where the additional Life Jackets are provided for specific operations as defined in the OSI, the number and type shall be submitted with proper justification to the ANC Authority for approval.

25.9.1 These operations include (but are not limited to): amphibious operations, stretchers when transferring patients at sea, persons carrying heavy equipment attached to their person, rescue/sea boat operations, replenishment at sea operations, flight operations, boarding parties, flight deck firefighting, and diving teams.

Rule 26. Personal Thermal Protection Suits

26.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

26.2 Unless expressly provided otherwise in this Rule, personal thermal protection suits shall comply with the LSA Code Paragraphs 2.3 “Immersion suits” and 2.4 “Anti-exposure suits”.

Note: Any solutions proposed to meet specific ADF service requirements that deviate from the Standards prescribed in this Rule shall be submitted with proper justification to the ANC Authority for approval.

26.3 The sizes of the personal thermal protection suits shall accommodate the full range of physical characteristics of the embarked persons.

26.4 The number, location, and stowage arrangements of personal thermal protection suits on board shall be the same as the requirement for lifejackets, unless:

26.4.1 Entry into the water to board the survival craft is not probable and sufficient protection from the elements is offered by the survival craft, e.g. for survival craft which are boarded prior to launching such as totally enclosed lifeboats, free-fall lifeboats or davit-launched liferafts and for liferafts which are served by an MES or equivalent. However, for liferafts, as a minimum thermal protective aid shall be provided complying with the requirements of LSA Code Paragraphs 2.5. The number and location of these thermal protective aids shall be similar to the requirements of lifejackets.

26.4.2 The vessel is constantly engaged on voyages in warm climates where, in the opinion of the ANC Authority, personal thermal protection suits are unnecessary. Refer to IMO MSC/Circ.1046 “Guidelines for Assessment of Thermal Protection”.

26.5 Personal thermal protection suits shall be provided for every person assigned to crew the rescue craft or assigned to the MES party.

Rule 27. Rescue Arrangements

27.1 The NVO shall present and justify a solution for demonstrating compliance to Part 1 of the ANC Rules. In the presentation and justification of a solution, the following shall be considered.

Solution

Rescue Craft Arrangements

27.2 Unless expressly provided otherwise in this Rule, rescue craft shall comply with:

27.2.1 IMO Resolution A.656(16) “Guidelines for Fast Rescue Boats”; or

27.2.2 LSA Code Chapter 5 “Rescue boats”; or where applicable

27.2.3 IMO MSC/Circ.809 “Recommendation for canopied reversible liferafts, automatically self-righting life-rafts and fast rescue boats, including testing, on ro-ro passenger ships.”

27.3 Naval vessels shall carry at least one rescue craft unless justification is submitted to the ANC Authority for approval.

27.4 All rescue craft shall be capable of being launched, where necessary utilising painters, with the ship making headway at speeds up to 5 knots in calm weather.

27.5 A lifeboat may be accepted as a rescue craft provided it also complies with the requirements of a rescue boat and the launching arrangements comply with the requirements for rescue boats.

27.6 A rescue craft shall permit taking an unconscious embarked person without capsizing.

27.7 The rescue craft shall allow for safe and efficient handling of a stretcher.

Swimmer of the Watch

27.8 Naval vessels shall be provided with a rescue station from which the Swimmer of the Watch will operate in the recovery of persons over board shall be provided on each side of the vessel, in a position visible from the bridge or bridge wings, unless justification is submitted to the ANC Authority for approval.

27.9 Two recovery methods shall be provided at each rescue station, namely:

27.9.1 One-man lift, in which the wounded person and the swimmer are hoisted on board in turn, using a Shipborne Retrieval Strap.

27.9.2 Two-man lift, which uses a double harness to hoist the wounded person and the swimmer simultaneously.

27.10 The two-man lift may only be employed in vessels where the gantry/davit arrangements have been tested to a minimum safe working load of 275 kg.

27.11 Stowage for the Swimmer of the Watch equipment shall be provided as follows:

27.11.1 The Swimmer of the Watch recovery line shall be on a drum, covered and protected from the elements but capable of rapid removal.

27.11.2 The harness for the Swimmer of the Watch shall be contained in a suitable weatherproofed quick to open bag.

27.11.3 The Shipborne Retrieval Strap shall be stowed such that it is protected from the elements, and readily available.

Mass rescue

27.12 Each vessel shall be provided with a system for mass rescue, which may coincide with boarding systems, such as:

27.12.1 A climbing net capable of reaching at least 2m below the lightest loaded waterline from an open deck from which persons can easily embark the Naval Vessel; or

27.12.2 A MES, provided the slide is equipped with hand-lines or ladders to aid in climbing up the slide; or

27.12.3 A device capable of rapidly recovering rescue or survival craft and transferring survivors to the ship.

27.13 For the location where person or persons are recovered, the following shall be considered:

27.13.1 Equipment to transport a casualty with decreased mobility out of the rescue boat.

27.13.2 Enough workspace on the open deck to take care of the casualty.

Line-throwing appliance

27.14 One line-throwing appliance shall be carried to assist with the recovery of persons over board:

27.14.1 The line-throwing appliance shall comply with the requirements of LSA Code Paragraph 7.1 “Line-throwing appliances”.

Note: Any solutions proposed to meet specific ADF service requirements that deviate from the Standards prescribed in this Rule shall be submitted with proper justification to the ANC Authority for approval.

27.14.2 The line-throwing appliance shall be stowed such that it is operational in all anticipated environmental conditions and located ready for immediate use.

Lifebuoys

27.15 Unless expressly provided otherwise in this Rule, Lifebuoys shall comply with requirements of LSA Code Paragraph 2.1. “Lifebuoys"

27.16 The minimum number of lifebuoys carried by a naval vessel shall be 2 for every 20 metres of vessel length or part thereof, with a minimum of 8 unless agreed otherwise with the ANC Authority.

27.17 Self-igniting lights for lifebuoys on vessels carrying cargos with high fire risks, such as replenishment vessels, shall be of an electric battery type.

27.18 The positioning and securing arrangements of the self-activating light and smoke signals shall be such that they cannot be released or activated solely by the accelerations produced by collisions or groundings.

27.19 Lifebuoys shall be so distributed as to be readily available on both sides of the ship and as far as practicable on all open decks extending to the vessel’s side; at least one shall be placed in the vicinity of the stern.

27.20 All lifebuoys shall be mounted in such a position that they can be released rapidly from their stowage to fall unobstructed into the sea, or easily cast into the sea to give a seamark by day or night. They shall not be permanently secured in any way. Where the design of the lifebuoy arrangement includes a means to avoid the accretion of ice which potentially conflicts with these requirements, the ANC Authority shall approve the arrangement.

27.21 At least one lifebuoy on each side of the vessel shall be fitted with buoyant lines of length not less than twice the height at which it is stowed above the waterline in the lightest seagoing condition, or 30 metres, whichever is the greater.

27.22 Not less than half of the total number of lifebuoys shall be provided with lifebuoy self-igniting lights with a minimum of 6 and an increased number for vessels with an operational role which includes operation in sustained darkness. Not less than two of the above lifebuoys shall also be provided with lifebuoy self-activating smoke signals and be capable of quick release from the bridge. Lifebuoys with lights and those with lights and smoke signals shall be equally distributed on both sides of the vessel and shall not be the lifebuoys provided with lifelines.

Note: Operation in sustained darkness may include ships operating within the Arctic or Antarctic circles or a role requiring significant night-time operation. This should be recorded in the OSI.

27.23 The ANC Authority may require additional lifebuoys to be capable of quick release from the bridge due to the layout of the vessel or the operational requirement for closed down conditions.

27.24 If a remote-control release system is provided, it must be capable of manual override in case of power failure and without resorting to the use of any tools or equipment to effect release of lifebuoy.