INTERNATIONAL MARITIME ORGANIZATION

IMO

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MARITIME SAFETY COMMITTEE
84th session
Agenda item 5

MSC 84/INF.5
6 February 2008
ENGLISH ONLY

GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

The Naval Ship Code

Submitted by the Netherlands

SUMMARY	
Executive summary:	With reference to the debate on goal-based standards, this submission provides information on the Naval Ship Code referenced to in several documents
Strategic direction:	10.1
High-level action:	10.1.1
Planned output:	10.1.1.2
Action to be taken:	Paragraph 4
Related document:	MSC 83/INF.4

Introduction

1 In document MSC 83/INF.4, submitted by the Netherlands, the SOLAS chapter on life-saving appliances (chapter III) has been written in a goal-based standards format to be used as an example on how goal-based standards may be further developed. In that submission reference is made to the Naval Ship Code.

2 The Naval Ship Code was developed with the aim to provide a framework for a naval surface ship safety management system based on and benchmarked against IMO Conventions and resolutions that embraces the majority of ships operated by navies. The Code follows the same approach for goal-based standards as has been developed in the IMO until today.

3 Information on the Naval Ship Code and underlying documents can be found on www.nakmo.co.uk. However, in order to facilitate future discussions on goal-based standards in IMO, the Naval Ship Code and, as an example, the contents pages and chapter VII (Escape, evacuation and rescue) of the annex to the Code are annexed to this submission.

Action requested of the Committee

4 The Committee is invited to note the information provided in this document for use in further development of goal-based standards.

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ANNEX

NATO UNCLASSIFIED

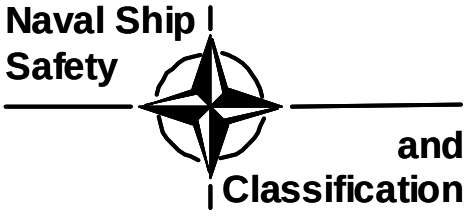
ALLIED NAVAL ENGINEERING PUBLICATION

ANEP – 77

NAVAL SHIP CODE

March 2007

NATO Naval Armaments Group
Maritime Capability Group 6
Specialist Team on Naval Ship Safety and Classification



FEEDBACK

Any comments concerning this publication should be directed to NATO/MAS – Bvd, Leopold III, 1110 Brussels - BE.

RECORD OF RESERVATIONS

Nation	Record of Reservations
AUS	
BE	
CA	
DA	
FI	
FR	
GE	
GR	
IT	
LU	
NL	
NO	
PO	
PT	
RO	
RU	
SP	
SWE	
TU	
UA	
UK	Chapters 1, 2, 3 and 7 adopted 1 January 2007
US	

Contents

Related documents:
Guide to the Naval Ship Code
IMO SOLAS
IMO Code of Safety for High Speed Craft
IMO Code of Safety for Special Purpose Ships

1 Aim

1.1 The overall aim of the Naval Ship Code is to provide a framework for a naval surface ship safety management system based on and benchmarked against IMO conventions and resolutions that embraces the majority of ships operated by Navies.

2 Scope

2.1 The Naval Ship Code is applicable to all naval surface ships, not nuclear powered, which insofar as the Navies wish it to apply to their own ships and vessels, includes all ships belonging to or operated by the armed forces, coastguard or other protection and security department or agency of a State.

2.2 Noting that the Naval Ship Code is based on and benchmarked against IMO conventions and resolutions (see above), it therefore contains safety related issues that correspond in scope to that which is covered by IMO publications but which reflect the fundamental nature of naval ships. However, the Naval Ship Code adds value by including guidance to Navies and Classification Societies on enhancements to cover military requirements such as survivability or quality of power supplies. Text that reflects military requirements is included as an Information Note and it is then for Navies to decide whether the requirement is adopted or not.

3 General

3.1 The requirements and procedures for implementing the Naval Ship Code are outlined in the Annex to the Naval Ship Code.

3.2 This opening text addresses the need for a Naval Ship Code, the conditions attached to application and the methodology adopted for development and application.

3.3 The Naval Ship Code is supported by a companion document, the Guide to the Naval Ship Code, which provides guidance on how the Naval Ship Code is developed and maintained and how it should be applied.

4 Conditions for Application

4.1 NATO and Partners for Peace Navies. Navies who adopt the Naval Ship Code and all parties involved in application must recognise that:

a. Implementation of the provisions of the Naval Ship Code is a matter for each party;

b. Costs incurred in the development of the Naval Ship Code are to fall to the member of the Naval Ship Safety and Classification team and no recompense will be sought from the NATO;

c. All parties shall endeavour to bring equivalence of resource to the work of the Naval Ship Safety and Classification team;

d. NATO and PfP nations who for the time being elect not to be a member of the Naval Ship Safety and Classification team shall have a standing invitation to join the team at any time;

f. Nothing in this agreement shall be construed as restricting individual parties from pursuing their own work in the field of naval ship safety and classification. However, all parties are encouraged to share their work with the other parties.

4.2 International Maritime Organisation. Recognising that much inspiration for the Naval Ship Code has been drawn from the work of the International Maritime Organisation (IMO), members of the Naval Ship Safety and Classification team:

a. Acknowledge IMO's role in serving merchant shipping;

b. Recognise the significant contribution of the work of IMO to the safety of merchant shipping and the protection of the environment;

c. Recognise that the IMO Secretariat has noted this NATO initiative and the IMO request for a periodic update of NATO's progress and intentions with respect to naval ship safety.

4.3 Classification Societies and the Naval Ship Classification Association. Through the Naval Ship Classification Association (NSCA), members and associates of the NSCA shall:

a. Hold a standing invitation to join the Naval Ship Safety and Classification team at any time whereupon they shall play as full a role as possible consistent with their non-governmental status;

b. Hold a standing invitation to be present at all sessions of the Naval Ship Safety and Classification team and its study groups;

c. Hold a standing invitation to be represented, with the permission of the NATO MCG6 Chairman, at all relevant sessions of the MCG6 meetings.

d. Be encouraged to recognise the Naval Ship Code and the work of the Naval Ship Safety and Classification team in their naval business activity as independent Classification Societies.

4.4 Other Navies. Navies who are not a NATO member or a NATO Partner for Peace may adopt the Naval Ship Code to manage the safety of their ships. Such Navies are:-

a. encouraged to notify the Naval Ship Safety and Classificaiton team of their intentions

b. provide feedback to the Naval Ship Safety and Classification team; and

c. with the permission of NATO MCG6, become associate members of the Naval Ship Safety and Classification team, contribute to development and abide by the aforementioned conditions for NATO and PfP Navies (see 4.1).

5 Philosophy

5.1 The Naval Ship Code adopts a goal based approach. The basic principle of a goal based approach is that the goals should represent the top tiers of the framework, against which ship is verified both at design and construction stages, and during ship operation. This approach has several advantages over more traditional prescriptive standards:

a. The Naval Ship Code can become prescriptive if appropriate for the subject, or alternatively, remain at a high level with reference to other standards and their assurance processes.

b. The goal based approach permits innovation by allowing alternative arrangements to be justified as complying with the higher level requirements.

c. Non-compliances can be managed in a more controlled manner by referring to the higher level intent.

5.2 For the development of the Naval Ship Code, a hierarchy of tiers has been adopted as shown in Figure 1. The increasing width of the triangle as the Naval Ship Code descends through the tiers implies an increasing level of detail.

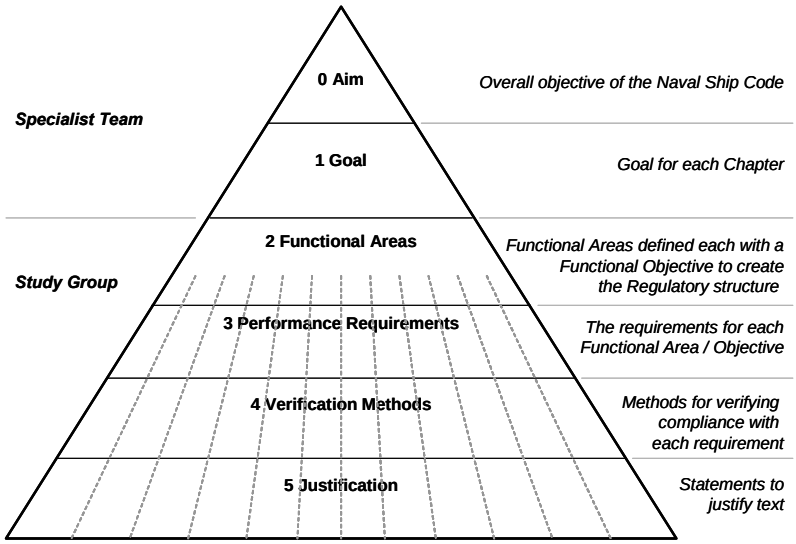


Figure 1: Goal Based Approach to Developing the Naval Ship Code

5.3 The following example, based on escape, evacuation and rescue, illustrates how the methodology is used:

a. Tier 0 Aim. The overall Aim, Philosophies and Principles of the Naval Ship Code (covered in Regulation 0 of Chapter 1 of the Annex to the Naval Ship Code).

b. Tier 1 Goal. For each subject covered by a chapter in the Naval Ship Code, such as escape, evacuation and rescue, a goal is established. This is recorded in each Chapter as Regulation 0. For example, the Goal for Escape, Evacuation and Resue may include the statement :

"The arrangements for the escape, evacuation and rescue of embarked persons shall be designed, constructed and maintained to….provide a safe means of evacuation from the ship".

c. Tier 2 Functional Areas. Once the goal has been set, Functional Areas are defined that provide a structure to the chapter so that relevant requirements and acceptance criteria can be captured. Typically, each Functional Area is covered by a Regulation in the chapter; one Functional Area might be "Stretchers". Functional Objectives can then be defined as a lower level goal for each Functional Area such as:

"Stretchers shall enable embarked persons to transport incapacitated persons during the escape and evacuation process".

d. Tier 3 Performance Requirements. The performance requirements are relevant to the Functional Areas which are to be complied with and are to be verified during design, construction and operation, to meet the aforementioned aim, philosophies and goals. The performance requirements are independent of the technical or operational solution and have a qualitative character. This will allow for future alternative technical or operational solutions, which were not available at the time of development of the Naval Ship Code text. A performance requirement for stretchers may be:

> *"Stretchers shall…enable crew members to transport any embarked person throughout the vessel, without that person's assistance"*

e. Tier 4 Verification Methods. The method for confirming that the arrangements on the ship are compliant with the requirement is to be defined in one of three ways; (1) a prescriptive requirement, (2) a performance based solution or (3) through delegation to a Recognised Organisation for confirmation that the requirement has been met. For stretchers, the verification methods are likely to be prescriptive in nature as the subject is well understood (eliminating the need for a option (2)) and is not well covered by the standards of a typical Recognised Organisation (eliminating option (3)). A verification method for a stretcher could include:

> *"The chosen stretchers shall allow the casualty to be fitted vertically with the stretcher either vertical or horizontal"*

f. Tier 5 Justification. Finally, statements justifying how the Performance Requirements and associated Verification Methods meet the Principles, Aim and Philosophies of the Naval Ship Code and the Goal for the subject. As opposed to other tiers, Tier 5 is developed for future management of the Naval Ship Code. Key issues are captured in the companion document, the Guide to the Naval Ship Code.

5.4 For some Chapters it may considered sufficient to establishing requirements for the upper tiers only. In such cases establishing Tier 4 and 5 will be the responsibility of Recognised Organisations such as a Classification Society; with the Naval Administration retaining responsibility for accepting the lower Tiers support the higher level Tiers.

6 Application

6.1 The principles of application are outlined in Chapter 1 Regulation 1a of the Annex and supplementary guidance is shown in Figure 2 below. The arrangement involves three parties:

a. The Owner is responsible for ensuring that design, material and equipment selection, construction and in-service operation and maintenance are carried out and demonstrating that this is undertaken correctly in accordance with standards agreed with the Naval Administration in the Concept of Operations Statement. Where verification of compliance and the issue of certification are not to be provided by the Naval Administration, the Owner is, with the agreement of the Naval Administration, to task a Recognised Organisation to do this;

b. The Naval Administration is responsible for putting in place arrangements for safety assurance and ensuring that standards are available that are suitable for naval ships. The Naval Administration is is also responsible for ensuring the Owner has access to either the Naval Administration or a suitable and authorised Recognised Organisation who will confirm verification of compliance and issue certification against the ship role, operating and maintenance philosophy, environmental conditions, survivability and principle standards set out in the Concept of Operations Statement; and

c. The Recognised Organisation (typically a Classification Society) authorised by the Naval Administration who will, when tasked by the Owner, confirm verification of compliance and issue certification. The Recognised Organisation may also be called upon by the Naval Administration to assist in the development of safety assurance arrangements that supplement the Recognised Organisation's own standards.

6.2 Ideally, a naval ship will comply in all respects with the agreed standards througout its life from concept through to disposal. However, there will inevitably be some aspects of the ship design, material, equipment or construction that fall short of the agreed standards. It is the responsibility of the Naval Administration (or the Recognised Organisation on behalf of the Naval Administration) to certify the management of these.

There are a number of alternatives to how these non-compliances are managed:

a. Minor Non-Compliances. These can generally be demonstrated to either not affect the ship safety, or offer an equivalent solution that achieves at least the same level of safety. In these cases, the certifying organisation will record these as a Memorandum Item to capture the agreement for future reference.

b. Moderate Non-Compliances. These are of such a nature that ship safety is compromised. They will require rectification and the certifying organisation will need to agree a date by which the rectification work shall be complete, and the aspect of concern re-surveyed or re-assessed. In some cases, it may be necessary to issue temporary operating restrictions or instructions to control the extent of the hazard. These non-compliances are referred to as Conditions of Certification.

c. Refusal or Withdrawal of Certification. Ultimately, if the non-compliance is of a significant nature, the certifying organisation may refuse to issue or withdraw certification until the non-compliance has been rectified by the Owner to the satisfaction of the certifying organisation.

NSC Chapter 1 Reg 1a Principles	Owner	Naval Administration	Recognised Organisation
(a) (i) the definition of the Concept of Operations that describes the role, ship attributes, required survivability, the environment, and the operating and maintenance philosophies;	Sets capability, undertakes concept design, engages with Naval Administration to set ConOps	Provides advice to Owner on clarity of ConOps	Provides advice to Owner and Naval Administration as required
(a) (ii) the selection of verification methods appropriate to the Concept of Operations and the safety goal outlined at Regulation 0 Goal above;	Agrees verification methods with Naval Administration and organisation to verify	Agrees verification methods with Owner and organisation (NA and/or RO) who will verify	Provides advice to Owner and Naval Administration on verification methods
(a) (iii) the assessment of the ship against the verification methods by which achievement of the safety goal can be judged;	Provision of design information to demonstrate design complies with verification methods	Assessment of design, material, equipment and ship as agreed at 2	Assessment of design, material, equipment and ship as agreed at 2
(a) (iv) the issue of certificate(s) by the Naval Administration (or its Recognised Organisation) to provide a visible demonstration of safety management and compliance with the safety goal	Rectification of shortfalls to ensure compliance with verification methods	Issue of Naval Ship Safety Certificate as agreed at 2	Issue of Naval Ship Safety Certificate as agreed at 2
(a) (v) periodic survey to ensure that the identified verification methods are being met and compliance with the safety goal is maintained.	Continual maintenance to ensure compliance with verification methods	Periodic review of design and ship, and issue of Naval Ship Safety Certification as agreed at 2	Periodic review of design and ship, and issue of Naval Ship Safety Certification as agreed at 2

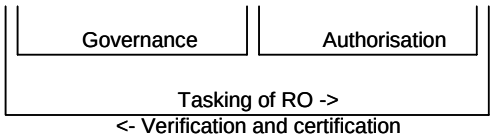


Figure 2: Application of the Naval Ship Code

ANNEX TO THE NAVAL SHIP CODE

CONTENTS

CHAPTER VII ESCAPE, EVACUATION AND RESCUE

Regulation 0 Goal

1 The arrangements for the Escape, Evacuation and Rescue of embarked persons shall be designed, constructed and maintained to:

.1 provide effective escape for all embarked persons from all manned spaces to a place of safety in the event of foreseeable accidents and emergencies at least until the threat has receded;

.2 provide an effective means of evacuation from the ship;

.3 provide an effective means of recovering persons from the sea.

Regulation 1 General

Functional Objective

1 Naval vessels shall be adequately designed, constructed, equipped, maintained and provided with procedures for the Escape, Evacuation and Rescue of all embarked persons following all foreseeable emergency situations and damage conditions.

Definitions

2 The following definitions are applicable to Chapter VII:

.1 Accommodation Space – Crew spaces such as corridors, heads & bathrooms, cabins, offices, mess decks, hospitals, pantries containing no cooking appliances and similar spaces.

.2 Anticipated List or Trim for Damaged Conditions – worst case trim and list as determined from Chapter III and as a minimum shall be 10° of trim and 20° of list either way.

.3 Anti-exposure suit – protective suit for use by rescue boat crews and MES parties.

.4 Approval Procedure – procedure that verifies the compliance of a vessel with the objectives of this Chapter.

.5 Boarding equipment – MES, ladders, nets, etc.

.6 Catastrophic Failure – failure which diminishes below an acceptable level the proper operation of any Escape, Evacuation and Rescue measure.

.7 Clear Width of an Escape Route – the net width of an escape route when the width of equipment, handrails and any other items are subtracted.

.8 Climbing net – net used for disembarkation of persons to the survival craft and for the rescue of persons from the water.

.9 Compartment - Any space within the vessel.

.10 Electrically Powered Directional Sounding System – a system which requires electrical power for its operation and uses sound to identify escape routes or escape exits.

.11 Electrically Powered Low Location Lighting System – Low Location Lighting system which requires electrical power for its operation, such as systems using incandescent bulbs, light emitting diodes, electro luminescent strips or lamps, electro fluorescent lamps, etc.

.12 Embarkation ladder – ladder provided at evacuation stations to permit safe access to survival craft after launching.

.13 Emergency Escape Breathing Devices - device solely provided for local escape purposes.

.14 Enclosed Escape Route – an escape route which offers fire and smoke protection in accordance with the requirements of Chapter VI Fire Safety.

.15 Escape – the movement of persons to a place of relative safety on board the vessel following an emergency.

.16 Escape and Evacuation Analysis – both types of escape and evacuation analysis: simplified (hydraulic representation) and advanced (individuals modelled).

.17 Escape and Evacuation Demonstration – trial on the vessel as built.

.18 Escape and Evacuation Time - time it takes for persons to undergo all steps of the escape and evacuation process from the initiating announcement to evacuate the vessel the last person has evacuated in a survival craft and all survival craft are cleared from the vessel.

.19 Escape, Evacuation and Rescue Equipment Stowage – any stowage such as containers, brackets, racks and other similar stowage locations designated for any Escape, Evacuation and Rescue equipment.

.20 Escape, Evacuation and Rescue Lighting System – both normal and emergency lighting which are installed for use during Escape, Evacuation and Rescue emergencies. This systems may be incorporated in the general lighting system.

.21 Escape, Evacuation and Rescue Measures – any Escape, Evacuation and Rescue arrangement, equipment or procedure.

.22 Escape Route – a designated route ultimately leading from a compartment to the evacuation station, thereby including both primary and secondary routes, for the purposes of local and global escape.

.23 Evacuation – the movement of persons to a place of relative safety away from the damaged vessel.

.24 Evacuation Arrangements – both the evacuation station as boarding equipment.

.25 Evacuation Station – location on board from which embarked persons can safely evacuate into survival craft. These locations may not be designated for evacuation purposes only and may in some ships be considered to be the whole upper deck.

.26 Evacuation Time - time required to provide for the evacuation of the total number of embarked persons, including the time for launching, inflating, securing of survival craft alongside ready for evacuation, boarding the survival craft and safely for clearing all survival craft away from the damaged vessel.

.27 External Communication System – includes all Global Maritime Distress and Safety Systems, flares, radios, transponders, day-light signalling lamp, etc.

.28 Fixtures and fittings on Escape Routes – Doors, hatches, stairways, ladders, scuttles, panels, handrails, etc.

.29 FSS-Code – IMO MSC 98(73) “International Code for Fire Safety Systems”.

.30 General Emergency Alarm System – an alarm which is used to notify all embarked persons of an emergency incident.

.31 Headquarters – Compartment from which damage control, fire-fighting or escape and evacuation activities is controlled.

.32 Immersion Suit – protective suit which reduces the body heat loss of a person wearing it in cold water.

.33 Inspection and Maintenance – All measures for the preservation and/or restoration of the original conditions of the technical elements of a system as well as measures for the determination and evaluation of the actual conditions

.34 Launching Arrangements – launching station and its equipment.

.35 Launching Equipment – equipment designated for transferring survival and rescue craft from its stowed position safely to the water and from the water to the stowed position.

.36 Launching Stations – designated positions for launching survival and rescue craft. Launching stations may coincide with evacuation stations.

.37 Low-Location Lighting – electrically powered lighting or photo luminescent indicators placed throughout a vessel to readily identify escape routes and escape exits.

.38 LSA-Code – IMO MSC 48(66) “International Life-Saving Appliance Code”

.39 Main Broadcast System - a system that permits one-way verbal communication to all embarked persons, in merchant shipping known as public address system.

.40 Marine Evacuation Systems – appliance for the rapid transfer of persons from the evacuation station into a floating survival craft.

.41 Marshal Craft – designated craft for marshalling survival craft that are not self-propelled, often also rated as rescue craft.

.42 Muster Station – an area of relative safety where embarked persons can be gathered in the event of an emergency and prepared for evacuation. Muster stations may coincide with evacuation stations and are otherwise known as emergency or assembly stations.

.43 Normally Occupied Compartment – Any compartment which regularly occupied by embarked persons.

.44 Novel Life-Saving Measure – life-saving measure which embodies new features not fully covered by the provisions of this Chapter but which provides an equal or higher standard of safety.

.45 On Board Documentation – posters, plans and other guidance information on any Escape, Evacuation and Rescue measures.

.46 On Board Two-Way Communication System – system providing two-way verbal transmission and may include fixed or portable system or a combination of both.

.47 Personal Thermal Protection Suits – suits that are designed to prevent hypothermia and/or cold shock, i.e., immersion suits, anti-exposure suits.

.48 Photo Luminescent Low Location Lighting System – Low Location Lighting system which uses PL material. PL material contains a chemical (example: zinc sulphide) that has the quality of storing energy when illuminated by visible light. The PL material emits light which becomes visible when the ambient light source is less effective. Without the light source to re-energize it, the PL material gives off the stored energy for a period of time with diminishing luminance.

.49 Power Supply to Escape, Evacuation and Rescue Systems - both normal and emergency electrical supplies essential for Escape, Evacuation and Rescue activities.

.50 Primary Escape Route – the most direct route of escape from a compartment or number of compartments to the evacuation station. The primary escape route may or may not be coincident with the general access arrangements.

.51 Recovery Time for a Rescue Boat – time required to raise the boat to a position where persons can disembark from it to the deck of the naval vessel. Recovery time includes the time required to make preparations for recovery on board the rescue boat such as passing and securing a painter, connecting the rescue boat to the launching

appliance, and the time to raise the rescue boat. Recovery time does not include the time needed to lower the launching appliance into position to recover the rescue boat.

.52 Rescue – the survival and recovery of persons to a safe haven, which offers an equivalent or higher level of safety than that prior to the incident.

.53 Rescue Arrangements – the rescue station and equipment.

.54 Rescue Boat – boat to rescue persons over board which may also be used to as a marshal craft.

.55 Rescue Equipment – any equipment that may be used for the recovery of persons from the sea and/or survival craft, i.e. rescue boats, ladders, scramble nets, life buoys, light markers, harnesses, MES etc.

.56 Routine Escape, Evacuation and Rescue Procedures – all procedures normally performed on board which are to ensure effective Escape, Evacuation and Rescue performance, except inspection, maintenance and training.

.57 Secondary Escape Route – escape route which provides an alternative option to the primary escape route.

.58 Stretchers – equipment designated to transport persons who are incapable of walking to muster and/or evacuation stations.

.59 Survival Craft – any type of craft such as lifeboat (free-fall or davit launched), liferaft or rescue boat, capable of sustaining the lives of persons within following the evacuation of the main vessel.

.60 Way Finding Systems – any system which is provided to enable embarked persons to find escape routes and escape exits.

3 Abbreviations

.1	DS	Directional Sounding
.2	FMEA	Failure Mode Effect Analysis
.3	FSS-Code	International Code for Fire Safety Systems
.4	IMO	International Maritime Organisation
.5	ISO	International Organization for Standardization
.6	LSA-Code	International Life Saving Appliance Code
.7	MES	Marine Evacuation System
.8	MSC	Maritime Safety Committee

Performance Requirements

4 Escape, Evacuation and Rescue measures shall be in place to ensure that the vessel is as safe as reasonably practicable for all embarked persons to conduct Escape, Evacuation and Rescue, by:

.1 Allowing embarked persons to escape as effectively as practicable to the evacuation station, whether or not by assembling at a separate muster station first;

.2 Allowing embarked persons to evacuate as effectively as practicable from the evacuation station of the damaged vessel into survival craft;

.3 Supporting the life of evacuated persons, who may be in a survival craft, as long as reasonably practicable and commensurate with the anticipated time for rescue; and

.4 Permitting the rescue of persons from the sea or from survival craft.

5 Escape, Evacuation and Rescue measures shall:

.1 Be robust and have a minimum vulnerability. Redundancy shall be provided to secure Escape, Evacuation and Rescue functionality from catastrophic failure unless the identified mode of failure is extremely improbable;

.2 Not be affected by the vessel's weapon and sensor systems;

.3 Present minimum risk of injury to the embarked persons during normal operations, training, maintenance and emergency situations;

.4 Not have a detrimental impact on other Escape, Evacuation and Rescue measures on board.

6 The provision of Escape, Evacuation and Rescue measures shall reflect:

.1 The maritime environment: All exposed arrangements or equipment shall be designed and maintained to withstand the development of corrosion, shall be rot-proofed and shall be able to withstand sunlight (including ultra-violet), oil and fungal attack without degradation of performance;

.2 The intended area of operation: Escape, Evacuation and Rescue equipment and their stowages shall be designed, constructed and maintained for the extremes of temperature and humidity to be experienced in the declared areas of operation. Furthermore, evacuation and rescue equipment shall be designed in accordance with the expected maximum time to rescue from shore or other external facilities;

.3 The embarked persons: i.e. number and distribution of embarked persons, taking into account their physical characteristics, their knowledge of the vessel and its safety equipment;

.4 Foreseeable emergencies resulting in Escape, Evacuation and Rescue activities: as a minimum these would include list, trim, flooding, fire, smoke, hazardous vapours and obstruction of fixtures and fittings such as doors.

Note: For all references in this Chapter to SOLAS, the following applies: (1) where the IMO document uses the term "passenger", it should be read to mean "non-crew" as defined in Chapter 1 of this document (2) where the IMO document refers to SOLAS II-1/42 or II-1/43, it should be read to mean Regulation 14 Power Supply to Escape, Evacuation and Rescue Systems.

Verification Methods

7 Verification that the ship complies with this chapter shall be by the Naval Administration. The burden of verification falls upon the Naval Administration. All decisions that affect compliance with the requirements of this chapter shall be recorded at all stages from concept to disposal and these records be maintained throughout the life of the ship.

Regulation 2 Escape, Evacuation and Rescue Measures

Functional Objective

1 The ship's Escape, Evacuation and Rescue measures are to comply with the objectives of this Chapter.

Performance Requirements

2 The ship's Escape, Evacuation and Rescue measures are to comply with the objectives of this Chapter including equipment, systems, arrangements and associated procedures.

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

.1 The evacuation time of the undamaged vessel does not exceed 30 minutes; and

.2 The Escape and Evacuation time of the undamaged vessel does not exceed:

i. 60 minutes for vessels with ro-ro spaces or with less than 3 main vertical fire zones;

ii. 80 minutes for other vessels.

4 Before giving approval, the Naval Administration shall ensure that:

.1 Equipment and arrangements are tested, to confirm that they comply with the requirements of this Chapter, in accordance with IMO MSC (81)70 "Revised recommendations on testing of Life-Saving Appliances", modified by MSC 200(80); or

.2 Have successfully undergone, to the satisfaction of the Naval Administration, tests which are substantially equivalent to those specified in those recommendations.

5 Before giving approval to novel Escape, Evacuation and Rescue measures, the Naval Administration shall ensure that such measures:

.1 Provide safety standards at least equivalent to the requirements of this Chapter and have been evaluated and tested in accordance with IMO Resolution A520(13) "Code of Practice for the Evaluation, Testing and Acceptance of Prototype Novel Life-Saving Appliances and Arrangements"; or

.2 Have successfully undergone, to the satisfaction of the Naval Administration, evaluation and tests which are substantially equivalent to those recommendations.

6 Escape, Evacuation and Rescue equipment shall be subjected to such product tests as are necessary to ensure that Escape, Evacuation and Rescue equipment is manufactured to the same standards as the approved prototype.

7 Life-saving appliances required by this Chapter for which detailed specifications are not included in this Chapter shall be to the satisfaction of the Naval Administration.

8 Procedures adopted by the Naval Administration for approval shall also include the conditions whereby approval would continue or would be withdrawn.

Verification Methods

9 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 3 Escape and Evacuation Analysis and Demonstration

Functional Objective

1 Escape and Evacuation Analysis and Escape and Evacuation Demonstration shall ensure that effectiveness of escape and evacuation measures are optimised.

Performance Requirements

2 An Escape and Evacuation Analysis shall:

.1 Optimise the effectiveness of escape and evacuation measures, considering:

i. normal seagoing conditions;

ii. damaged conditions defined in the Concept of Operations Statement.

.2 Represent flows of persons during escape and evacuation as factual as possible.

3 An Escape and Evacuation Demonstration shall:

.1 Verify the accuracy of the Escape and Evacuation Analysis;

.2 Enable the Naval Administration to identify unforeseen shortcomings of Escape and Evacuation measures;

.3 Represent flows of persons during escape and evacuation as realistically as possible;

.4 Not impose unacceptable risks to persons involved in the demonstration.

4 An Escape and Evacuation Analysis and an Escape and Evacuation Demonstration shall be undertaken for all new designs of naval vessels where Escape and Evacuation measures differ substantially from those that have previously undergone an Escape and Evacuation Analysis or an Escape and Evacuation Demonstration. During service, 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 Naval Administration.

5 An Escape and Evacuation Analysis shall be undertaken early in the design process, to investigate possible improvements of the ship's Escape and Evacuation measures.

6 The scope and extent of the Escape and Evacuation Analysis shall be to the satisfaction of the Naval Administration, taking into account the fire and flooding hazards, the layout of the ship and the number of embarked persons.

7 The Escape and Evacuation Analysis shall be undertaken in accordance with the philosophy described in IMO MSC Circular 1033 "Interim guidelines for evacuation analysis for new and existing passenger ships", with the following adjustments:

.1 Target times for escape and evacuation shall be according to Regulation 7.2 Approval Procedures;

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

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

i. 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

ii. 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 4b (for case 2b). One of the two following alternatives should be considered for case 3, case 4a and case 4b:

a. alternative 1: Only 50% of the stairways or ladder capacity previously used within the identified main vertical zone is considered available for the analysis; 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 muster station (if provided) or evacuation station through that zone.

iii. If the total number of embarked persons calculated, as indicated in the above cases, exceeds the maximum number of persons the ship will be certified to carry, the initial distribution of people should be scaled down so that the total number of persons is equal to what the ship will be certified to carry.

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

8 The Naval Administration shall verify if the instructions of IMO MSC Circular 1033 need to be altered to reflect the vessel's procedures during escape and evacuation more accurately, in particular case 2a shall be adjusted to take into account the various possible distributions of embarked persons.

9 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.

10 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 half trials are impractical, the Naval Administration may consider a partial trial using a route which the Escape and Evacuation Analysis shows to be the most critical.

11 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 vessels subject to the consideration of the Naval Administration.

12 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:

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

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

.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.

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

13 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.

14 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 life-jackets and personal thermal protection suits, and the time necessary to launch, inflate and secure the survival craft alongside ready for evacuation.

15 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 Regulation 2 Approval Procedures 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 Naval Administration.

Verification Methods

16 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 4 Inspection and Maintenance

Functional Objective

1 Inspection and maintenance procedures shall ensure that any Escape, Evacuation and Rescue arrangement or equipment has an availability which is as high as reasonably practicable.

Performance Requirements

2 Escape, Evacuation and Rescue arrangements and equipment shall have a reliability which is as high as reasonably practicable.

3 Unless expressly provided otherwise in this Code, inspection and maintenance shall comply with:

.1 IMO Resolution A752(18) “Guidelines for the evaluation, testing and application of low-location lighting on passenger ships”, Paragraph 9;

.2 ISO 15370:2001 “Ships and marine technology – Low-location lighting on passenger ships – Arrangement”, Paragraph 8;

.3 IMO MSC Circular 955 “Servicing of life-saving appliances and radio communication equipment under the harmonized system of survey and certification (HSSC)”.

.4 IMO MSC Circular 1093 “Guidelines for periodic servicing and maintenance of lifeboats, launching appliances and on-load release gear”;

.5 IMO MSC Circular 1047 “Guidelines for monthly shipboard inspection of immersion suits and anti-exposure suits by ship’s crews”;

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

.7 IMO Resolution A761(18) “Recommendations on conditions for the approval of servicing stations for inflatable liferafts” revised by IMO MSC 81(70).

4 The Naval Administration 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.

<u>On board inspection and maintenance</u>

5 Named persons or identified posts on board shall be nominated to ensure that all Escape, Evacuation and Rescue arrangements and equipment are maintained in good condition.

6 Instructions for on board inspection and maintenance of all Escape, Evacuation and Rescue arrangements and equipment shall be provided on board and maintenance shall be carried out accordingly. The Naval Administration may accept a shipboard planned maintenance programme.

7 Instructions for on board maintenance of all Escape, Evacuation and Rescue arrangements and equipment shall be in accordance with the manufacturers’ instructions. They shall be easily understood, illustrated wherever possible and, as appropriate, shall include the following for each appliance:

.1 A checklist for use when carrying out the inspections;

.2 Maintenance and repair instructions;

.3 Schedule of periodic maintenance;

.4 Diagram of lubrication points with the recommended lubricants;

.5 List of replaceable parts;

.6 List of sources of spare parts;

.7 Log for records of inspections and maintenance, including Certificates of Testing, Servicing and Packing, and repair records.

8 Spares and repair equipment shall be provided for Escape, Evacuation and Rescue equipment and their components which are subject to excessive wear or consumption and need to be replaced regularly.

9 A report of all on board inspection and maintenance shall be kept within a log book.

10 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:

.1 The following tests and inspections shall be carried out weekly;

i. All survival craft, rescue craft and launching appliances shall be visually inspected to ensure that they are ready for use. The inspection shall include, but is not limited to, the condition of hooks, their attachment to the boats and the on-load release gear being properly and completely reset;

ii. All engines in survival and rescue craft shall be run for a total period of not less than 3 minutes provided the ambient temperature is above the minimum temperature required for starting and running the engine. During this period of time, it shall be demonstrated that the gear box and gear box train are engaging satisfactorily. If the special characteristics of an outboard motor fitted to a rescue craft would not allow it to be run other than with its propeller submerged for a period of 3 minutes, it shall be run for such period as prescribed in the manufacturer's handbook;

iii. Lifeboats, except free-fall lifeboats, shall be moved from their stowed position, without any embarked persons, to the extend necessary to demonstrate satisfactory operation of launching appliances, if weather and sea conditions so allow;

iv. The general emergency alarm system, main broadcast system and other essential Escape, Evacuation and Rescue communication equipment shall be tested.

.2 The following shall be carried out monthly;

i. Inspection of all Escape, Evacuation and Rescue arrangements and equipment covered by this Chapter, shall be carried out to ensure that they are complete and in good order;

ii. All lifeboats, except free-fall lifeboats, shakll be turned out from their stowed position, without any embarked persons if weather and sea conditions so allow.

11 Way finding systems:

.1 Where PL LLL is provided through adhesive stickers, their presence shall be checked by a routine inspection.

.2 All LLL systems should have their luminance tested in accordance with ISO 15370:2001..

12 Emergency Escape Breathing Devices:

.1 Maintenance shall be in accordance with the manufacturer's instruction and inspection by a competent person shall be undertaken at least annually.

13 Inflatable survival craft containers:

.1 Shall be handled with care to avoid bumping, especially on deck projections as rough handling may disturb the contents and prevent proper inflation.

14 Where pyrotechnics are stowed within the Escape, Evacuation and Rescue equipment stowages then the following precautions shall be followed:

.1 No work shall be carried out on the stowages;

.2 No welding or burning shall take place within a 6 metre radius of the stowage.

15 Launching appliances:

.1 Shall be serviced at recommended intervals in accordance with instructions for on board maintenance.

16 Survival craft on load release gear:

.1 Shall be serviced at recommended intervals in accordance with instructions for on board maintenance.

17 Maintenance of falls:

.1 Falls used in launching shall be turned end for end at intervals of not more than 30 months and be renewed when necessary due to deterioration of the falls or at intervals of not more than five years, whichever is the earlier;

.2 The Naval Administration may accept in lieu of the "end for ending" required, periodic inspection of the falls and their renewal whenever necessary due to deterioration or at intervals of not more than four years, whichever one is earlier.

<u>Shore-based Servicing</u>

18 Certificates of "Servicing and Testing" shall be provided for all Escape, Evacuation and Rescue related equipment as proof that the requirements of this Code have been met. The certificates shall be returned with the equipment when serviced.

19 Every inflatable survival craft, inflatable life-jacket, MES, inflated rescue craft and hydrostatic release units, other than disposable hydrostatic release units, shall be serviced:

.1 At intervals not exceeding 12 months, where this is impracticable, the Naval Administration may extend this period to 17 months;

.2 At a servicing station, approved by both the Naval Administration and the manufacturer, that is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.

20 In addition to or in conjunction with the servicing intervals of MES, each MES shall be deployed from the vessel on a rotational basis at intervals to be agreed by the Naval Administration provided that each system shall be deployed at least once every six years.

21 A Naval Administration which approves new and novel inflatable survival craft arrangements may allow for extended service intervals on the following conditions:

.1 The new and novel survival craft arrangement has proved to maintain the same standard, as required by testing procedure, during extended service intervals;

.2 The survival craft system shall be checked on board by certified personnel;

.3 Service at intervals not exceeding five years shall be carried out in accordance with the recommendations of the Naval Administration.

22 All repairs and maintenance of inflated rescue craft shall be carried out in accordance with the manufacturer's instructions. Emergency repairs may be carried out on board the ship; however, permanent repairs shall be effected at an approved servicing station.

23 Launching appliances shall:

.1 be subjected to a thorough examination at intervals not exceeding 5 years;

.2 upon completion of the examination be subjected to a dynamic test of the winch brake at maximum lowering speed. The load to be applied shall be the mass of the lifeboat without embarked persons, except at intervals not exceeding five years, the test shall be carried out with a proof load of 1.1 times the maximum working load of the winch.

24 Lifeboat on load release gear:

.1 Shall be subjected to a thorough examination and test during the surveys of Chapter 1 by properly trained personnel familiar with the system;

.2 Shall be operationally tested under a load of 1.1 times the total mass of the lifeboat when loaded with its full complement of persons and equipment whenever the release gear is overhauled. Overhauling and test shall be carried out at least every five years.

Verification Methods

25 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 5 Routine Escape, Evacuation and Rescue Procedures

Functional Objective

1 Routine Escape, Evacuation and Rescue procedures shall ensure that effective Escape, Evacuation and Rescue measures are available prior to sailing and whilst at sea.

Performance Requirements

2 Routine Escape, Evacuation and Rescue procedures shall:

.1 Ensure that sufficient Escape, Evacuation and Rescue measures are available on board for the forthcoming operation, considering:

i. The embarked persons;

ii. The areas of operation.

.2 Ensure that any Escape, Evacuation and Rescue measures remain fully available during normal operating conditions.

3 Escape, Evacuation and Rescue procedures shall ensure that prior to sailing and whilst at sea:

.1 All required Escape, Evacuation and Rescue measures are available on board and ready for immediate use;

.2 All Escape, Evacuation and Rescue measures are maintained in good condition by assigned personnel;

.3 Each person on board is aware of duties assigned to him during the Escape, Evacuation and Rescue process.

4 Prior to sailing, it shall be verified that:

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

i. Number of embarked persons, their characteristics and ship knowledge;

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

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

.3 All embarked persons have received basic Escape, Evacuation and Rescue training according to the requirements of Regulation 7 Training and Drills;

.4 A sufficient number of skilled persons are on board to be able to conduct any task of the Escape, Evacuation and Rescue process, including to the Escape, Evacuation and Rescue duties in Regulation 7 Training and Drills. Every person shall be familiar with assigned Escape, Evacuation and Rescue duties before the voyage begins;

.5 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;

.6 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

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

5 On board procedures shall ensure that whilst at sea:

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

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

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

Verification Methods

6 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 6 Escape, Evacuation and Rescue Emergency Procedures

Functional Objective

1 Escape, Evacuation and Rescue emergency procedures shall enable assigned crew members perform their assigned Escape, Evacuation and Rescue tasks effectively.

Performance Requirements

2 Escape, Evacuation and Rescue emergency procedures shall:

.1 Cover all duties in the Escape, Evacuation and Rescue process;

.2 Be clear and unambiguous;

.3 Incorporate redundancy.

3 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:

.1 Closing of watertight doors, fire doors, valves, scuppers, sidescuttles, skylights, portholes and other similar openings in the ship;

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

.3 Preparation and launching of survival craft;

.4 Preparation of other Escape, Evacuation and Rescue equipment;

.5 Mustering those persons that need to be mustered;

.6 Use of communication equipment.

4 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.

5 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:

.1 Warning persons who are unfamiliar to the vessel;

.2 Seeing that they are suitably clad and have donned their life-jackets and personal thermal protection suits correctly;

.3 Assembling persons that need to be mustered at muster stations;

.4 Controlling the movements of persons unfamiliar to the vessel.

6 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.

7 The approval of the Escape, Evacuation and Rescue emergency procedures shall, amongst others, be based on an Escape and Evacuation Analysis and an Escape and Evacuation Demonstration (Regulation 3 Escape and Evacuation Analysis and Demonstration).

8 An easy-to-use decision support system for emergency management shall be provided to support the commanding officer for handling any foreseeable combination of emergency situations. At least the following emergency situations shall be identified:

.1 Damage to ship, including fire;

.2 Personnel, cargo and on board weapon related accidents;

.3 Emergency assistance to other ships.

Verification Methods

9 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 7 Training and Drills

Functional Objective

1 Training and drill procedures shall ensure all embarked persons have sufficient skills to undertake Escape, Evacuation and Rescue.

Performance Requirements

2 Training and drill procedures shall:
- .1 Ensure that all embarked persons are able to conduct basic Escape, Evacuation and Rescue tasks;
- .2 Ensure assigned embarked persons are able to conduct their Escape, Evacuation and Rescue related duties;
- .3 Be available for all Escape, Evacuation and Rescue measures and duties;
- .4 Be clear and understandable;
- .5 Not impose unacceptable risk to the vessel or the embarked persons.

3 Training requirements shall be defined for drills, musters and for the operation, maintenance and testing of specific equipment.

4 Escape, Evacuation and Rescue drills shall, as far as practicable, be conducted as if there were an actual emergency.

5 Information cards, posters or electronic visual programmes may be used to supplement training and drills but may not be used to replace it.

6 The details of all on board Escape, Evacuation and Rescue related training shall be recorded in a log-book as agreed with the Naval Administration.

7 Procedures shall be provided to ensure that equipment used during Escape, Evacuation and Rescue training are immediately brought back to its fully operational condition and any faults and defects discovered during this training shall be remedied as soon as possible.

8 Procedures shall be provided to ensure that every person, including persons not familiar to the vessel such as embarked forces, special personnel or passengers, is given basic Escape, Evacuation and Rescue training within 24 hours of joining the ship. This basic Escape, Evacuation and Rescue training shall include but not necessarily be limited to:
- .1 Essential actions each persons should take in an emergency;
- .2 The alarm and main broadcasting signals;
- .3 Location, operation and use of the vessel's personal Escape, Evacuation and Rescue equipment, i.e. Emergency Escape Breathing Devices, personal thermal protection suits and life-jackets;
- .4 Location of the muster stations (if provided) and evacuation stations.

9 Procedures shall be provided to ensure that every embarked person with assigned Escape, Evacuation and Rescue duties is trained for these duties prior to sailing. Escape, Evacuation and Rescue duties include, at least:
- .1 Operation of main broadcast system, alarm system and other communication equipment;
- .2 Operation of electrically powered way finding system and emergency lighting;
- .3 Operation and launching of evacuation and rescue equipment (including retraction of stabiliser wings when necessary);
- .4 Rescue operations;
- .5 Operating the engine of survival craft and carrying out minor adjustments (at least two persons for every motorized survival craft);
- .6 Distress and safety radio communication;
- .7 Use of stretchers;
- .8 Mustering and assisting persons who are not familiar with the Escape, Evacuation and Rescue measures during Escape, Evacuation and Rescue activities.

10 Procedures shall be provided to ensure that every embarked person is given training at intervals of not more than two months, which shall include but not necessarily be limited to:
- .1 Location, operation and use of the vessels' personal life saving equipment;
- .2 Location of the muster stations (if provided) and evacuation stations;
- .3 Problems of sea survival in particular cold shock, hypothermia, first-aid treatment for hypothermia and other appropriate first-aid procedures.

11 Additional procedures shall be provided to ensure that, every embarked person with assigned Escape, Evacuation and Rescue duties is given training at intervals of not more than two months, which shall include:
- .1 Training in performing their assigned Escape, Evacuation and Rescue duties;
- .2 Special instructions necessary for use of the vessel's evacuation and rescue equipment in severe weather and severe sea conditions.

12 For Emergency Escape Breathing Devices, procedures shall be provided to ensure:

.1 Embarked persons are trained to immediately don an Emergency Escape Breathing Device prior to exiting a space when the atmosphere becomes life threatening. Such training should be accomplished by scheduling routine escape drills.

.2 Embarked persons are trained in the use of Emergency Escape Breathing Devices and more specifically that they are provided solely for escape purposes. They are not to be used for heavy duty use such as fire-fighting, rescue or repair work. Additionally, they are not to be used for entering oxygen deficient voids or tanks. Emergency Escape Breathing Devices may be carried by fire-fighting crew for the purpose of providing the device to other embarked persons in need of emergency assistance.

.3 All Emergency Escape Breathing Device training units are clearly marked “FOR TRAINING PURPOSES ONLY”.

13 For rescue craft, procedures shall be provided to ensure that:

.1 Rescue craft crew are trained and drilled regularly in the use of the rescue craft where fitted. This training shall include all aspects of rescue, handling, manoeuvring, operating these craft in various conditions, and righting them after capsize. This training may partly take place in special training facilities;

.2 As far as is reasonable and practicable, rescue boats other than lifeboats which are also rescue craft, are launched each month with their assigned crew on board and manoeuvred in the water. In all cases this requirement shall be complied with at least once every three months;

.3 If rescue craft launching drills are carried out with the ship making headway, such drills shall, because of the dangers involved, be practised in sheltered waters only and under the supervision of an officer experienced in such drills. Refer to IMO A.624(15) “Guidelines on training for the purpose of launching lifeboats and rescue boats from ships making headway through the water”

14 For survival craft, procedures shall be provided to ensure that:

.1 Vessels fitted with lifeboats launch each lifeboat with its assigned operating crew on board and manoeuvred in the water at least once every three months during Escape, Evacuation and Rescue training;

.2 Lowering into the water, rather than launching of a lifeboat arranged for free-fall launching, is acceptable where free-fall launching is impracticable provided the lifeboat is free-fall launched with its assigned operating crew aboard and manoeuvred in the water at least once every six months. However, in cases where it is impracticable, the Naval Administration may extend this period to 12 months provided that arrangements are made for simulated launching which will take place at intervals of not more than six months.

.3 If lifeboat or marshal craft launching drills are carried out with the ship making headway, such drills shall, because of the dangers involved, be practised in sheltered waters only and under the supervision of an officer experienced in such drills. Refer to IMO A.624(15) “Guidelines on training for the purpose of launching lifeboats and rescue boats from ships making headway through the water”

15 For MES, the following applies:

.1 Every vessel fitted with a MES shall be provided with on board training aids in the use of the system;

.2 Training procedures shall include exercising of the procedures required for the deployment of such a system up to the point immediately preceding actual deployment of the system. This aspect of drills shall be augmented by regular instruction using the on-board training aids;

.3 Additional procedures shall be provided to ensure that every MES party member is trained in the full deployment of a similar system into water, either on board a vessel or ashore, at intervals of not longer than three years.

16 For davit-launched liferafts, procedures shall be provided to ensure that:

.1 On board training in the use of davit launched liferafts takes place at intervals of not more than four months. Whenever practicable this shall include the inflation and lowering of a liferaft. This liferaft may be a special liferaft intended for training purposes only, which is not part of the ship’s Escape, Evacuation and Rescue equipment; such a special liferaft shall be conspicuously marked.

Verification Methods

17 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 8 Provision of Operational Information

Functional Objective

1 On board documentation shall provide information for the conduct of effective Escape, Evacuation and Rescue activities.

Performance Requirements

2 On board information shall:

.1 Cover information necessary for embarked persons to conduct Escape, Evacuation and Rescue related activities.

.2 Be clear and understandable.

.3 Be readily found and shall be available at locations where they might be needed.

3 On board information relating to any Escape, Evacuation and Rescue measure shall cover adequate information and be sited at locations to facilitate Escape, Evacuation and Rescue evolutions, and shall be easily understood by embarked personnel. The information shall include:

.1 General description of all Escape, Evacuation and Rescue measures;

.2 Operational instructions of all Escape, Evacuation and Rescue measures;

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

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

4 Posters or signs shall be provided on conspicuous spaces on or near each Escape, Evacuation and Rescue equipment and shall:

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

.2 Be easily seen under emergency lighting conditions; and

.3 Be in accordance with IMO Resolution A760(18) “Symbols Related to Lifesaving Appliances and Arrangements” as amended by IMO MSC 81(70).

5 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, life-jackets, personal thermal protection suits and rescue equipment.

6 Strategic positions, such as the operations room, bridge, machinery control-room, engine room, damage control stations, shall in addition to Escape, Evacuation and Rescue plans be provided with:

.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;

.2 Guidance on priorities between Escape, Evacuation and Rescue activities and damage control or fire-fighting;

.3 Muster lists.

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

.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;

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

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

8 An Escape, Evacuation and Rescue training manual shall be provided in each crew mess room, containing instructions and information, in easily understood terms illustrated wherever possible, on the Escape, Evacuation and Rescue measures provided in the ship and on the best methods of survival. Any part of such information may be provided in the form of audio-visual aids in lieu of the manual. The following shall be explained in detail:

.1 Donning of lifejackets and personal thermal protection suits;

.2 Muster at the assigned stations;

.3 Boarding, launching and clearing the survival craft including, where applicable, use of MES;

.4 Method of launching from within the survival craft, where appropriate;

.5 Release from launching appliances, where appropriate;

.6 Methods and use of devices for protection in launching areas, where appropriate;

.7 Illumination in launching areas;

.8 Use of all survival equipment;

.9 Use of all detection equipment;

.10 With the assistance of illustrations, the use of Escape, Evacuation and Rescue communication equipment;

.11 Use of drogues;

.12 Use of engine and accessories;

.13 Recovery of survival craft including stowage and securing;

.14 Hazards of exposure and the need for warm clothing;

.15 Best use of the survival craft facilities in order to survive;

.16 Methods of retrieval, including the use of helicopter rescue gear (slings, baskets, stretchers), breeches-buoy and shore life saving apparatus and ship’s line-throwing apparatus;

.17 All other functions covered in the emergency instructions;

.18 Instructions for emergency repair of the life-saving appliances.

Verification Methods

9 The operational information is to be approved as being compliant with the above Performance Requirements.

Regulation 9 Escape, Evacuation and Rescue Equipment Stowages

Functional Objective

1 Escape, Evacuation and Rescue equipment stowages shall protect any on board Escape, Evacuation and Rescue equipment and ensure any on board Escape, Evacuation and Rescue equipment is readily available.

Performance Requirements

2 If applicable, the Escape, Evacuation and Rescue equipment stowages shall protect the stowed equipment as far as possible from:

.1 External environmental factors such as wash, green water, sea state, icing or wind;

.2 Vessel's weapon or sensor systems and aircraft down wash or jet blast;

.3 Fire, smoke or hazardous vapours.

3 Equipment stowages shall:

.1 Enable stored equipment to be accessible and readily deployed;

.2 Be robust and have minimum vulnerability;

.3 Be readily found and unambiguously recognised;

.4 Allow inspection of the stored equipment;

.5 Not have a detrimental effect on the stored equipment;

.6 Not have a detrimental impact on the ready deployment of any other stored equipment in case of an emergency;

.7 Be free from undue hazards, such as protrusions or obstructions which could cause injury or ensnare clothing, life-jackets or personal thermal protection suits.

.8 Be able to withstand vessels seakeeping accelerations.

4 Stowages of survival craft, rescue craft, personal thermal protection suits, life-jackets, life buoys and other external stored equipment shall enable the equipment to float free.

General Stowages

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

6 Compliance with the performance requirements, other than that for float-free stowages, shall be verified by a risk assessment in combination with demonstrations.

7 Containers, brackets, racks and other similar stowage locations for Escape, Evacuation and Rescue equipment shall be marked with symbols in accordance with the recommendations of the Naval Administration or in accordance with IMO Resolution A.760(38) "Symbols related to life-saving appliances and arrangements". 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.

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

9 As far as practicable, stowages shall not be located adjacent to any areas of fire or explosion hazard and shall be made of fire retardant material.

External Stowages

10 External stowages shall protect the stored equipment for negative effects in performance due to extremes of temperature, humidity and salt water which might be experienced in the declared areas of operation. Combinations of materials, finishes and processes must be carefully chosen to reduce the possibility of problems with corrosion. External stowages shall be rot-proofed and able to withstand sunlight (including ultra-violet), salt water, oil and fungal attack without degradation of performance.

11 External stowages shall remain capable of release and fulfilling their function with the anticipated levels of ice for the prescribed areas of operation.

12 As far as practicable, external stowages shall be located in a secure and sheltered position, in particular:

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

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

.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..

13 As far as is practicable, external stowages shall be distributed in the longitudinal direction so as to reduce vulnerability.

Float-free Stowages

14 Stowages of survival craft, rescue craft, personal thermal protection suits, life-jackets, life buoys and other external stored equipment shall have float-free arrangements. These float-free arrangements shall be such as to be minimum equivalent to the requirements for liferafts of LSA-Code Paragraph 4.1.6 "Float-free arrangements for liferafts".

15 Float-free stowages shall be positioned so that the stored equipment will float unobstructed when released hydrostatically. Great 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.

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

17 Any arrangements placed to cover any float free stowages, i.e. for signature reduction, shall have similar float free functionalities.

Survival Craft

18 Each survival craft shall be stowed:

.1 Taking into account the escape provisions, the size of the vessel and the weather conditions likely to be encountered in its intended area of operation;

.2 So that neither the survival craft nor its stowage arrangements will interfere with the operation of any other escape or evacuation equipment at any other station;

.3 As near the water surface as is safe and practicable and, in the case of a survival craft other than a liferaft intended for throw over board launching, in such a position that the survival craft in the embarkation position is not less than 2 m above the waterline with the ship in the fully loaded condition under anticipated list or trim for damaged conditions, or to the angle at which the vessel's weather deck edge becomes submerged, whichever is less;

.4 In a state of continuous readiness so that two crew members can carry out preparations for embarkation and launching in less than 5 min;

.5 Fully equipped as required by this Chapter and the LSA-Code.

.6 Such that it is protected from damage by fire and explosion. In particular, survival craft on tankers, other than those required by Regulation 24 Survival Craft, shall not be stowed on or above a tank containing explosive or hazardous cargoes.

19 For lifeboats the following applies:

.1 Lifeboats for lowering down the vessel's side shall be stowed as far forward of the propeller as practicable;

.2 Lifeboats shall be stowed attached to launching equipment.

20 For liferaft, the following applies:

.1 Every liferaft shall be stowed with its painter permanently attached to the vessel;

.2 Each liferaft or group of liferafts shall be stowed with a float-free arrangement complying with the requirements of Paragraph 4.1.6 "Float-free arrangements for liferafts" of the LSA-Code so that each floats free and, if inflatable, inflates automatically when the ship sinks.

.3 Liferafts shall be so stowed as to permit manual release of one raft or container at a time from their securing arrangements.

.4 Paragraphs .1 to .3 above do not apply to liferafts required by Regulation 24 Survival Craft.

21 Davit-launched liferafts shall be stowed within reach of the lifting hooks, unless some means of transfer is provided which is not rendered inoperable within the anticipated list or trim for damaged conditions or by ship motion or power failure.

22 As far as practicable, life rafts intended for throw-overboard launching shall be stowed as to be readily transferable for launching on either side of the vessel.

Rescue craft

23 Rescue craft shall be stowed:

.1 In a state of continuous readiness for launching in not more than 5 min;

.2 In a position suitable for launching and recovery;

.3 So that neither the rescue craft nor its stowage arrangements will interfere with the operation for any escape or evacuation equipment any other station;

.4 If it is also a survival craft, in compliance with the requirements of survival craft.

MES

24 Each MES shall be stowed so that neither the passage nor platform nor its stowage or operational arrangements will interfere with the operation of any escape or evacuation equipment at any other launching station.

Life-Jackets

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

Personal Thermal Protection Suits

26 Stowages close to the vessel's side shall be avoided. If impracticable they shall be fitted with a vertical bar outboard to prevent the containers rolling overboard should the container be opened on a damaged vessel with heel.

Verification Methods

27 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 10 General Emergency Alarm System

Functional Objective

1 A General Emergency Alarm System shall enable the notification of all embarked persons in a timely manner that an emergency situation exists.

Performance Requirements

2 The general emergency alarm shall:

.1 Be clearly noticeable by all embarked persons;

.2 Be easily distinguishable and recognisable;

.3 Be continuously available;

.4 Be protected from hazards as fire, vibration, electrical interference, flooding;

.5 Be provided such that any incident which may cause alarm failure shall be guarded against by system or equipment redundancy;

.6 Be operable from strategic Escape, Evacuation and Rescue positions.

3 Unless provided otherwise in this Code, the general emergency alarm shall comply with:

.1 LSA-Code Paragraph 7.2.1 "General emergency alarm system";

.2 IMO Resolution A.830(19) "Code on alarms and indicators", 1995;

.3 IMO MSC Circular 808: "Recommendation on performance standards for public address systems on passenger ships, including cabling", Paragraph 3.

4 A demonstration shall be used to verify whether the general emergency alarm is easily distinguishable from other signals on board.

5 The general emergency alarm system shall be clearly audible across the upper deck and within every compartment with all doors and accesses closed unless, specifically stated otherwise by the Naval Administration. In compartments where audible alarm may, on occasions, not comply with audibility levels, an additional visual alarm system shall be installed which cannot be confused with other indications and should be consistent throughout the vessel. A trial shall demonstrate that the general emergency alarm is clearly audible and/or visible.

6 When the general emergency alarm system is integrated within another system, such as entertainment systems, the alarm system shall have automatic priority over any other system input, so that all alarms will be broadcast even if any loudspeaker in the spaces concerned has been switched off or its volume has been turned down.

7 A number of operating positions shall be available for the general emergency alarm system. As a minimum this shall include the bridge, operations room and the main damage control headquarters. The operating positions shall be such that at sea:

.1 At least one operating position is continuously manned;

.2 During periods of increased risk, at least two of these positions are continuously manned (e.g. RAS, constricted navigational situations).

8 The power supply to the general emergency alarm shall comply with the requirements of Regulation 14 Power Supply to Escape, Evacuation and Rescue Systems.

9 A FMEA shall be approved by the Naval Administration showing any incident that may cause alarm failure is guarded against by system or equipment redundancy.

10 Communication equipment located or used in areas where flammable gases may be present shall be certified intrinsically safe.

Verification Methods

11 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 11 Main Broadcast System

Functional Objective

1 A main broadcast system shall enable verbal communication to embarked persons of an emergency incident and the actions to be taken.

Performance Requirements

2 The main broadcast system shall:
- .1 Allow one-way verbal communication to embarked persons;
- .2 Be clearly noticeable by all embarked persons;
- .3 Be easily distinguishable and recognisable;
- .4 Be continuously available;
- .5 Be protected from hazards as fire, vibration, electrical interference, flooding;
- .6 Be provided such that any incident which may cause alarm failure shall be guarded against by system or equipment redundancy;
- .7 Be operable from strategic Escape, Evacuation and Rescue positions.

3 Unless provided otherwise in this Code, the main broadcast system shall comply with:
- .1 LSA-Code Paragraph 7.2.2 “Public address system”;
- .2 IMO Resolution A.830(19) “Code on alarms and indicators”, 1995;
- .3 IMO MSC Circular 808: “Recommendation on performance standards for public address systems on passenger ships, including cabling”.

4 Where in any referenced IMO documents the term “public address system” is used, it should be read to mean “main broadcast system” for the purpose of this Naval Ship Code.

5 The main broadcast system shall be clearly distinguishable across the upper deck and within the ship with all doors and accesses closed, unless stated otherwise by the Naval Administration. A trial shall demonstrate that the main broadcast system is clearly audible and/or visible.

6 When the main broadcast system is integrated with systems other than the general alarm system, the broadcast system shall have automatic priority over any other system input, so that all announcements will be broadcast even if any loudspeaker in the spaces concerned has been switched off, its volume turned down or the main broadcast system is used for other purposes.

7 A number of operating positions shall be available for the main broadcast system. As a minimum this shall include the bridge, operations room and the damage control headquarters. At least one operating position is to be continuously manned when at sea. During periods of increased risk, at least two of these positions are to be continuously manned (e.g. RAS, constricted navigational situations).

8 The power supply to the general emergency alarm shall comply with the requirements of Regulation 14 Power Supply to Escape, Evacuation and Rescue Systems.

9 A FMEA shall be approved by the Naval Administration showing any incident that may cause main broadcast system failure is guarded against by system or equipment redundancy.

10 Loudspeakers shall be continuously rated for their proportionate share of amplifier output and protected against short-circuits.

11 Communication equipment located or used in areas where flammable gases may be present shall be certified intrinsically safe.

Verification Methods

12 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 12 On board Two-Way Communication

Functional Objective

1 On board two-way communication systems shall enable effective two-way communication between crew members to support Escape, Evacuation and Rescue activities.

Performance Requirements

2 On board two-way communication systems shall:
- .1 Allow clear and distinguishable two-way verbal communication;
- .2 Be suitably rated for the environment under which it will operate;

.3 Have complete system redundancy.

3 The two-way communication system shall be operable from all strategic Escape, Evacuation and Rescue positions, such as bridge and/or the Command, damage control stations, muster stations (if provided) and evacuation stations, machinery control room.

4 An emergency means comprised of either fixed or portable equipment or both shall be provided for two-way communications between strategic positions for Escape, Evacuation and Rescue.

5 Additionally, on vessels fitted with a MES, two-way communication shall be provided between the MES embarkation point and the platform or survival craft.

6 The power supply to the internal two-way communication system shall comply with the requirements of Regulation 14 Power Supply to Escape, Evacuation and Rescue Systems. Alternatively a redundant system not requiring a power supply shall be provided such as sound powered telephones or battery powered portable equipment.

7 Complete system redundancy shall be demonstrated through an FMEA.

8 Cables for internal communication systems shall be routed clear of galleys, machinery spaces and their casings and other high fire risk areas, except for supplying equipment in those spaces.

9 Communication equipment located or used in areas where flammable gases may be present shall be certified intrinsically safe.

10 Performance Requirements at paragraphs 2.1 and 2.2 above shall be verified by a risk assessment and/or a demonstration.

Verification Methods

11 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 13 External Communication Equipment

Functional Objective

1 External communication equipment shall enable communication to other vessel or to shore during emergencies.

Performance Requirements

2 While at sea, every vessel shall be capable of:

.1 Transmitting and receiving search and rescue co-ordinating communications;

.2 Transmitting ship to shore distress alerts;

.3 Transmitting and receiving ship to ship distress alerts.

3 External communication equipment shall:

.1 Be easy to operate including by those wearing fire fighting or other individual protective equipment;

.2 Incorporate redundancy;

.3 Be located at strategic Escape, Evacuation and Rescue positions;

.4 Be installed in such a way as to avoid harmful electromagnetic interference arising from, or being given to other equipment on board;

.5 Not cause injuries to persons utilising it.

4 Other performance requirements of Chapter 9 Radiocommunications shall be met.

5 Unless expressly provided otherwise in this Code, external communication equipment shall comply with:

.1 IMO Resolution A.802(19) “Performance standards for survival craft radar transponders for use in search and rescue operations”;

.2 IMO Resolution A.809(19) “Performance standards for survival craft two-way VHF radiotelephone apparatus”;

.3 LSA-Code, Chapter 3.1 “Rocket parachute flares”;

.4 IMO SOLAS Chapter IV “Radio communications”.

6 At least three waterproof portable two-way VHF radiotelephone apparatus shall be provided on every Naval vessel. The location shall be approved by the Naval Administration.

7 At least one radar transponder shall be carried on each side of the vessel. Radar transponders shall be stowed in such locations that they can be rapidly placed in any one of the survival craft. Alternatively, one radar transponder shall be stowed in each survival craft except those required by Regulation 24 Survival Craft.

8 Not less than 12 rocket parachute flares shall be carried and be stowed on or near the navigation bridge.

9 All vessels shall be provided with a portable daylight signalling lamp which is available at all times and which is not dependent on the vessel's main source of electrical power.

10 Communication equipment located or used in areas where flammable gases may be present shall be certified intrinsically safe.

Verification Methods

11 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 14 Power Supply to Escape, Evacuation and Rescue Systems

Functional Objective

1 The power supply to Escape, Evacuation and Rescue systems shall provide all sufficient power necessary to conduct any (combination of) Escape, Evacuation and Rescue activities during an emergency.

Performance Requirements

2 Power supply to Escape, Evacuation and Rescue systems shall:

.1 Have sufficient capacity to simultaneously operate any combination of Escape, Evacuation and Rescue equipment with any other essential consumers;

.2 Operate for a period as necessary to complete all Escape, Evacuation and Rescue activities;

.3 Be provided such that any incident which may cause power supply failure shall be guarded against by system or equipment redundancy, so that nominated equipment will be powered continuously;

.4 Have minimised vulnerability.

3 The power supply to the following Escape, Evacuation and Rescue systems shall fulfil the requirements of Chapter V Electrical Installations:

.1 Main broadcast system;

.2 General emergency alarm system;

.3 Internal communication system;

.4 Escape, Evacuation and Rescue lighting system;

.5 Radio communication equipment;

.6 Electrically powered way finding systems;

.7 Electrically powered operated doors;

.8 Additional systems as deemed necessary by the Naval Administration.

4 Failure of any power supply to any of the above systems shall operate an audible and visual alarm.

Verification Methods

5 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 15 Lighting During Escape, Evacuation and Rescue Emergencies

Functional Objective

1 Lighting systems shall provide sufficient illumination to conduct any Escape, Evacuation and Rescue activity during an emergency.

Performance Requirements

2 Escape, Evacuation and Rescue lighting systems shall:

.1 Provide sufficient illumination to any location essential for any Escape, Evacuation and Rescue activity;

.2 Operate for a period as necessary to complete all Escape, Evacuation and Rescue activities;

.3 Be provided such that any incident which may cause lighting failure shall be guarded against by system or equipment redundancy;

.4 Have minimised vulnerability.

3 The following locations shall be served by emergency lighting:

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

.2 All muster stations (if provided);

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

.4 All evacuation stations, both at the station as at the survival craft in the water;

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

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

.7 Additional locations as deemed necessary by the Naval Administration.

4 An extra means of illumination shall be provided in passageways and normally occupied compartments for a period of at least four hours for the event of a failure of all main and emergency lighting. The provision of lanterns that operate automatically from a self contained power source on failure of the main and emergency lighting systems is the minimum acceptable arrangement.

5 Escape, Evacuation and Rescue emergency lights shall be switched on automatically in the case of emergency or power failure, except for lights that may be seen from any location outside the vessel. It shall be possible to manually switch on such lights locally and from the bridge. The switches shall be clearly marked and readily recognized.

6 A FMEA shall be approved by the Naval Administration showing any incident that may cause emergency lighting failure is guarded against by system or equipment redundancy.

7 A lighting trial shall demonstrate, to the satisfaction of Naval Administration, that minimum illumination levels are met and that the position of fittings is satisfactory for each Escape, Evacuation and Rescue task that is to be undertaken in each individual compartment.

Verification Methods

8 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 16 Escape Routes and Escape Exits

Functional Objective

1 Escape routes and escape exits shall enable the movement of embarked persons from any compartment within the vessel to the muster stations (if provided) and evacuation stations as quickly and as safely as reasonably practicable.

Performance Requirements

2 Escape routes and escape exits shall:

.1 Be provided from any compartment within the vessel and shall lead to the muster stations (if provided) or evacuation stations.

.2 Be as direct as reasonably practicable;

.3 Be as flexible as reasonably practicable to provide for the possibility that certain escape routes may not be available as a result of fire, flooding or other damage;

.4 Remain functional as long as reasonably practicable during fire, flooding, list and trim;

.5 Be arranged such that they do not contribute to the spread of fire, flood, smoke or other toxic gases to any muster, evacuation or launching station;

.6 Allow for safe and easy movement of embarked persons, taking into account:

i. the anticipated number, physical characteristics and distribution of embarked persons, including the possibility that some injured personnel may be transported by stretchers;

ii. the size, location, function and risks of individual compartments on board;

iii. the clothing and personal protective equipment that may be worn or carried (e.g. fire fighting outfits, Emergency Escape Breathing Devices, life-jackets or personal thermal protection suits).

3 Unless expressly provided otherwise in this Regulation:

.1 At least two means of escape shall be provided from all compartments or group of compartments to the muster stations (if provided) and evacuation stations, as widely separated as possible;

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

.3 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. Furthermore, below the submergence limit, at least one of the means of escape shall be independent of watertight doors;

.4 Lifts are not to be considered as forming one of the means of escape.

.5 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.

4 The Naval Administration may dispense with one of the means of escape for:

.1 Compartments other than machinery and steering gear spaces with a travel distance lower than 7 m;

.2 Machinery spaces with a travel distance lower than 5 m;

.3 Steering gear spaces with a travel distance lower than 7 m and with direct access to the open deck;

.4 Dead-end passageways with a travel distance lower than 7 m.

.5 Dead-end corridors used in service areas which are necessary for the practical utility of the vessel, such as fuel oil stations and athwartship supply corridors, shall be permitted, provided such dead-end corridors are separated from any accommodation area and are entered only occasionally. Also, a part of a corridor that has a depth not exceeding its width is considered a recess or local extension and is permitted.

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

.1 The single means of escape shall comply with the requirements of a primary escape route.

.2 The single means of escape shall be independent of watertight doors.

.3 Fire detection systems complying with the requirements of Chapter VI Fire Safety shall be provided to give early warning of a fire emergency.

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

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

.2 Only be entered from areas with a low fire risk or by small passageways or airlocks 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 m^2, a width of no less than 900 mm.

7 For all escape routes, the following applies:

.1 Escape routes shall be demonstrated to be sufficiently effective by an Escape and Evacuation Analysis and an Escape and Evacuation Demonstration (see Regulation 3 Escape and Evacuation Analysis and Demonstration).

.2 Escapes route shall have fire integrity according to Chapter VI Fire Safety.

.3 Fixtures and fittings along escape routes shall comply with Regulation 17 Fixtures and Fittings on Escape Routes.

.4 Consideration shall be given to ease of escape under adverse conditions, i.e. in a darkened smoke filled atmosphere, under the anticipated list or trim for damaged conditions, or the presence of stretcher bound embarked persons etc.

.5 Unless specifically stated otherwise by the Naval Administration, 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.

.6 Primary escape routes ending in deck areas where vehicles or stores are manoeuvred or stored (e.g. hangars, vehicle decks, flight decks, stores) shall, as far as practicable, be protected from obstruction. When protection cannot be provided, the secondary escape route shall avoid direct access to this. Parking arrangements for vehicles on board shall maintain escape routes clear at all times.

.7 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.

.8 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.

.9 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.

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

.1 Emergency Escape Breathing Devices shall be provided to protect embarked persons from smoke and hazardous vapours during escape, as required by Regulation 20 Emergency Escape Breathing Devices.

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

.1 Protection shall be offered from green water;

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

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

.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. The internal and external primary escape routes shall comply with the requirements of Chapter VI Fire Safety.

.2 Primary escape routes via high fire risks compartments (e.g. machinery spaces, 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.

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

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

.5 The minimum clear width of stairways, ladders and passageways of primary escape routes shall not be less than 700 mm and shall not be inferior to those determined by the calculation method provided within the FSS-Code Paragraphs 2.1.2 and 2.3 or as proved necessary by Escape and Evacuation Analysis (Regulation 3 Escape and Evacuation Analysis and Demonstration).

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

.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.

.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 m of bulkheads and other partitions forming vertical divisions along primary escape routes shall be able to sustain a load of 750 N/m to allow them to be used as walking surfaces from the side of the escape route with the vessel at large angles of heel.

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

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

.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.

12 For local means of escape, the following applies:

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

.2 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:

i. 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 VI 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

ii. 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.

.3 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.

Verification Methods

13 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 17 Fixtures and Fittings on Escape Routes

Functional Objective

1 Fixtures and fittings on escape routes shall facilitate the movement of embarked persons from any space within the vessel to the evacuation station as quickly and as safely as reasonably practicable.

Performance Requirements

2 Fixtures and fittings shall:

.1 Allow for safe and easy movement of embarked persons, taking into account:

i. the anticipated number, physical characteristics and distribution of embarked persons;

ii. the size, location and function of individual compartments on board;

iii. the clothing and personal protective equipment that may be worn or carried (e.g. fire fighting outfits, Emergency Escape Breathing Devices, life-jackets or personal thermal protection suits).

.2 Offer a level of protection against fire hazards;

.3 Be arranged such that they do not contribute to the spread of fire, flood, smoke or other toxic gases to the muster, evacuation or launching stations;

.4 Be operable in case of normal operations and in case of anticipated level of list or trim for damaged conditions;

.5 Be operational in case of electrical power failure;

.6 Be readily identified.

3 All fixtures and fittings on escape routes and of escape exits shall be of steel frame construction, or have equivalent fire resistance to the satisfaction of the Naval Administration.

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

.1 Be clearly and permanently marked for identification and operation;

.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. This shall be demonstrated by an Escape and Evacuation Demonstration (see Regulation 3 Escape and Evacuation Analysis and Demonstration);

.3 Unless specifically stated otherwise in this Code, open in-way of the direction of escape.

5 Doors and hatches shall be capable of being readily operated from inside and outside the craft.

Handrails and handholds on escape routes

6 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:

.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.

.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 m in width and transverse corridors more than 1 m 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

7 Doors in primary and secondary escape routes shall, 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. 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.

8 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.

9 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.

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

Escape stairways and ladders

11 The following stairways and ladders shall be fitted for escape purposes:

.1 Stairways (i.e. sloping ladders) – on primary and secondary escape routes;

.2 Vertical Ladders – on primary and secondary escape routes for crew spaces that are entered only occasional;

.3 Flexible emergency ladders – on secondary escape routes only, for crew spaces that are entered only occasional. The arrangements and location shall be approved by the Naval Administration.

12 As far as practicable, escape stairways and ladders shall be arranged fore and aft and sited clear of through passageways.

13 Escape stairways and ladders shall not exceed 3.5 m 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.

14 The angle of inclination of stairways should be, in general, 45°, but not greater than 50°, and in machinery spaces and small spaces not more than 60°.

15 Stairways or ladders shall serve all hatches and scuttles which are part of primary or secondary escape routes and escape exits.

Escape hatches

16 Hatches shall be operable from above and below by one person. This may require spring counterbalance units or escape manholes to be incorporated into larger hatches.

17 Hatches shall be of sufficient size to allow for the passage of persons wearing personal protective equipment.

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.

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

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

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.

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.

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

Verification Methods

24 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 18 Way Finding System

Functional Objective

1 A way-finding system shall allow embarked persons to safely and effectively locate muster stations (if provided) and evacuation stations.

Performance Requirements

2 Way finding systems shall:

.1 Enable embarked persons to locate escape routes, escape exits, muster stations (if provided) and evacuation stations;

.2 Be unambiguous and readily found;

.3 Be operational in case of unavailability of electrical power;

.4 Be provided taking into account:

i. the anticipated distribution of embarked persons;

ii. the anticipated familiarity of embarked persons with the vessel.

.5 Lead from normally occupied compartments to the muster stations (if provided) and evacuation stations.

3 The arrangements of way finding systems shall as far as reasonably practicable take into account hazards such as fire, smoke and flood water.

4 Unless expressly provided otherwise in this Code, way finding systems shall comply with Paragraphs 4 to 8 (excluding 4.5) of IMO Resolution A752(18) “Guidelines for the evaluation, testing and application of low-location lighting on passenger ships”. Alternatively, the Naval Administration may adopt relevant paragraphs of ISO 15370:2001 “Ships and marine technology – Low-location lighting on passenger ships – Arrangement”.

5 IMO Resolution A760(18) “Symbols related to lifesaving appliances and arrangements” as amended by IMO MSC 82(70) may be a guidance document for the signage on board.

6 Escape plans indicating escape routes, muster stations (if provided) and evacuation stations shall be placed according to the requirements of Regulation 8 On board Documentation.

7 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.

8 All way-finding markings on internal escape routes are to be by photo-luminescent strip indicators 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.

9 Additional arrows shall be positioned on internal escape routes:

.1 At a nominal height of 1500 mm above the deck in order to remain visible in the event of flooding;

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

10 Markings shall be placed such that they cannot be obscured by doors or hatches in the open position.

11 For escape routes, which are normally supplied by red light, the effectiveness of the photo-luminescent system shall be demonstrated to the satisfaction of the Naval Administration. If the Photo Luminescent system is not proven to be effective, Photo Luminescent Low Location Lighting shall be enhanced by Electrically Powered Low Location Lighting or Electrically Powered Directional Sounding .

12 Where adhesives are used for the Photo Luminescent Low Location Lighting signage and markings, the adhesion shall be suitable for envisaged conditions (e.g. presence of heating in galleys, water within heads and bathrooms) and shall be approved by the Naval Administration.

13 When Electrically Powered Low Location Lighting or Electrically Powered Directional Sounding is installed to enhance Photo Luminescent Low Location Lighting , it shall:

.1 Be provided with an Escape, Evacuation and Rescue power supplies as stated in Regulation 14 Power Supply to Escape, Evacuation and Rescue Systems.

.2 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.

14 Additionally, Electrically Powered Directional Sounding shall be approved by the Naval Administration based on a risk assessment to ensure that it complies with the performance requirements.

15 The Naval Administration shall ensure that such lighting or photo-luminescent equipment has been evaluated, tested and applied in accordance with the FSS-Code.

16 The functionality of each escape way-finding system shall be demonstrated by practical tests to the satisfaction of the Naval Administration.

Verification Methods

17 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 19 Muster Station

Functional Objective

1 Muster stations shall allow assembly of embarked persons in a position of relative safety.

Performance Requirements

2 Muster stations shall:

.1 Be of sufficient size for the number of persons assigned to it and the anticipated actions undertaken prior to moving to the evacuation station;

.2 Be readily accessed from normally occupied compartments and provide ease of escape to evacuation stations as far as practicable;

.3 Reflect the number and anticipated distribution of embarked persons;

.4 Have redundancy if any primary muster station is unavailable owing to the emergency;

.5 Provide protection against hazard for persons within (e.g. fire, green water).

3 For vessels carrying a total of more than 50 persons without an assigned task related to safeguarding the vessel's essential safety functions, such as embarked forces or special personnel, muster stations shall be provided. An alternative muster station shall be nominated in event of the main muster station becoming unavailable.

4 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.

5 Each muster station shall have sufficient clear deck space to accommodate all persons assigned to muster at that station, but at least 0.35 m^2 per person.

6 Muster stations shall be positioned to reduce risk from fire, smoke and hazardous vapour and shall have fire integrity characteristics according to Chapter VI Fire Safety.

7 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 waterline and contain provision for draining down of water.

8 Muster stations shall be readily and safely accessed from normally occupied compartments and provide ease of escape to evacuation stations as far as practicable. These routes shall have similar characteristics as required for primary escape routes (see Regulation 16 Escape Routes and Escape Exits).

9 It shall be demonstrated, based on an Escape and Evacuation Analysis and an Escape and Evacuation Demonstration following the requirements of Regulation 3 Escape and Evacuation Analysis and Demonstration, that:

.1 Assigned muster stations can be readily and swiftly accessed from normally occupied compartments, accommodation and work areas;

.2 Assigned muster stations provide readily and swiftly escape to evacuation stations;

.3 The muster station are sufficiently illuminated by the Escape, Evacuation and Rescue lighting system to be able to marshal and count the persons assigned to the muster station and to don life-jackets;

.4 The muster station is free from undue hazards, such as protrusions or obstructions which could cause injury or ensnare clothing or life-jackets.

10 The Naval Administration shall approve the following items, based on a risk assessment:

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

.2 External influences such as wash or green water;

.3 Vessel's weapon and sensor systems;

.4 Fire, smoke and hazardous vapours;

.5 The muster station and the escape route to the evacuation station shall not contribute to the spread of fire, flood, smoke or other toxic gases to the evacuation stations;

.6 The muster station shall be operational in case of flooding, taking into account the anticipated list or trim for damaged conditions;

.7 The muster station shall be positioned above the waterline and contain provision for draining down of water.

Verification Methods

11 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 20 Emergency Escape Breathing Devices

Functional Objective

1 Emergency escape breathing devices shall provide embarked persons breathing and visual protection against a hazardous atmosphere while escaping to an area of relative safety.

Performance Requirements

2 Emergency escape breathing devices shall:

.1 Provide breathing and visual protection against smoke and hazardous gases for any crew member;

.2 Provide protection for the time necessary to escape to a safe haven;

.3 Be clearly identifiable;

.4 Be readily available;

.5 Be provided and located considering:

i. The number and distribution of embarked persons;

ii. Hazardous compartments;

iii. Escape routes.

.6 Be easy to don, without assistance;

.7 Be easily apparent to operate;

.8 Shall not hinder the person's movement during escape.

3 Unless expressly provided otherwise in this Code, Emergency Escape Breathing Devices shall comply with the FSS-Code.

4 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 Regulation 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 as stipulated by the FSS-Code shall be increased accordingly.

5 The vessel shall carry at least a number of Emergency Escape Breathing Devices equivalent to 150% of the total number of crew members. Additional provision of Emergency Escape Breathing Devices for other embarked persons shall be to the satisfaction of the Naval Administration.

6 The distribution of Emergency Escape Breathing Devices on board shall be approved by the Naval Administration. As a minimum, Emergency Escape Breathing Devices shall be provided along each primary escape route, adjacent to normally occupied compartments. Furthermore, the distribution shall reflect:

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

.2 Risks of fire, smoke and hazardous gases throughout the vessel;

.3 Risk of entrapment (e.g. main machinery spaces);

7 Emergency Escape Breathing Devices shall be situated ready for use at easily visible and accessible places. Emergency Escape Breathing Devices 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).

8 The number and location of the Emergency Escape Breathing Devices shall be indicated in the fire control plan required by Chapter VI Fire Safety.

Verification Methods

9 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 21 Stretchers

Functional Objective

1 Stretchers shall enable embarked persons to transport incapacitated persons during the escape and evacuation process.

Performance Requirements

2 Stretchers shall:
- .1 Enable crew members to transporting any embarked person throughout the vessel, without that person's assistance.
- .2 Be provided and located considering:
  - i. The number, distribution and anthropometrical characteristics of embarked persons;
  - ii. Hazardous compartments;
  - iii. Escape routes.

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

4 The chosen stretchers shall reflect the physical constraints on board. Consideration should be given to ensuring that the stretchers can be used within the confined spaces of the vessel.

5 The chosen stretchers shall allow the casualty to be lifted vertically with the stretcher either vertical or horizontal.

Verification Methods

6 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 22 Launching Arrangements

Functional Objective

1 Launching arrangements shall enable survival craft and/or rescue craft to be effectively launched onto the water.

Performance Requirements

2 Launching arrangements shall:
- .1 Be capable of launching a survival or rescue craft safely;
- .2 Be operable in case of normal operating conditions and in case of anticipated levels of list or trim;
- .3 Be as flexible as reasonably practicable to provide for the possibility that certain launching arrangements may not be available as a result of fire, flooding, jamming or other reasons.
- .4 Be protected as far as possible from:
  - i. External environmental factors such as wash, green water, sea state, icing or wind;
  - ii. Vessel's weapon and sensor systems;
  - iii. Fire, smoke or hazardous vapours.
- .5 Be free from undue hazards, such as protrusions or obstructions which could cause injury or ensnare clothing, life-jackets or personal thermal protection suits.
- .6 Be easily accessed from normally occupied spaces and allow easy escape to the evacuation stations.

3 The launching station shall:
- .1 Not be located above the approved launching height of the survival craft, rescue craft or launching equipment;
- .2 Be positioned so that survival craft and rescue craft can be launched clear of all obstructions under normal conditions and under the anticipated list or trim for damaged conditions.

4 Launching equipment shall:
- .1 Be easily and unambiguously used;
- .2 Be robust and have a minimum vulnerability;
- .3 Be able to function without power supply;
- .4 Not impose insurmountable dangers to the embarked persons during normal operations, training, maintenance or emergency situations;
- .5 For survival craft, specifically lifeboats:
  - i. Be capable of recovering the lifeboat;
- .6 For rescue craft:
  - i. Allow boarding and launching in the shortest possible time;
  - ii. Be capable of recovering the rescue craft in the shortest possible time;
  - iii. Allow launching with the naval vessel making headway.

5 Unless expressly provided otherwise in this Code, launching equipment shall comply with the LSA-Code Paragraph 6.1 “Launching and embarkation appliances” except for Paragraph 6.1.6 “Embarkation ladders”.

6 The launching station shall have fire integrity characteristics according to Chapter VI Fire Safety. Launching arrangements shall be readily and safely accessed from normally occupied compartments and provide ease of escape to evacuation stations as far as practicable, which shall be verified by an Escape and Evacuation Analysis and an Escape and Evacuation Demonstration (Regulation 3 Escape and Evacuation Analysis and Demonstration). These routes shall have similar characteristics as required for primary escape routes (Regulation 16 Escape Routes and Escape Exits).

7 Launching stations shall be located:

.1 As close as possible to the muster station (if provided), evacuation station and the stowage position of its survival or rescue craft;

.2 Such that the survival or rescue craft can be safely launched in a simple manner and remain secured to the vessel during the launching procedure;

.3 In such positions as to ensure safe launching of its survival and rescue craft having particular regard to clearance from the propeller, stabilisers and steeply overhanging portions of the hull. Where possible launching stations, except stations provided for free-fall boats, shall be located above a straight side of the vessel;

.4 Abaft the collision bulkhead, in a sheltered position, and if located forward, special consideration shall be given to the strength of the launching equipment;

.5 As far as practicable located away from magazines, in particular ready use magazines on the upper deck;

.6 So that they, as far as practicable, are equally distributed on each side of the vessel.

8 The launching arrangements shall be as near the water surface as is safe and practicable.

9 Launching arrangements shall be protected as far as possible from:

.1 External influences such as wash or green water;

.2 Vessel's weapon and sensor systems;

.3 Fire, smoke or hazardous vapours.

10 Launching arrangements shall be such that its survival or rescue craft can be observed at all times during launching and where applicable remain visible during recovery.

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

12 Preparation and handling of survival craft at any one launching station shall not interfere with the prompt preparation and handling of any other survival craft at any other station.

13 Falls, where used, shall 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.

14 Launching arrangements shall avoid, where possible, overboard discharges so as to prevent flooding of survival and rescue craft.

15 If there is a danger of the survival craft being damaged by the vessel’s stabilizer wings, means shall be available, powered by an emergency source of energy, to bring the stabilizer wings in board; indicators operated by an emergency source of energy shall be available on the navigating bridge to show the position of the stabilizer wings.

16 Launching equipment shall be provided for survival and rescue craft which have a mass of more than 185 kg and for liferafts which cannot be launching directly from the stowed position under the anticipated trim and heel in damaged conditions.

17 Launching equipment shall be operational in case of maximum anticipated list or trim for damaged conditions. If the anticipated list or trim for damaged conditions exceed a list of 20° and a trim of 10° either way, the launching equipment shall be proven to be operational during these conditions.

18 For vessels with lifeboats, the following applies:

.1 The launching arrangements shall be such that the lifeboats can be boarded prior to launching.

19 For vessels with davit-launched survival craft, the following applies:

.1 The height of the davit head with the craft in evacuation position, shall, as far as practicable, not exceed 15 m to the waterline when the vessel is in its lightest seagoing condition.

.2 The evacuation arrangements shall be designed for boarding and launching from a position immediately adjacent to the stowed position or from a position which, in compliance with Regulation 9 Escape, Evacuation and Rescue Equipment Stowages, the survival craft is transferred to prior to launching.

20 For vessels with partially enclosed lifeboats, the following applies:

.1 A davit span shall be provided, fitted with not less than two lifelines of sufficient length to reach the water with the vessel in its lightest seagoing condition, under unfavourable conditions of list and trim for damaged conditions.

21 For rescue craft, the following applies:

.1 Launching arrangements shall comply with the requirements for launching arrangements for survival craft.

.2 Launching arrangements shall enable launching the rescue craft, where necessary utilizing painters, with the vessel making headway at speeds up to 5 knots in calm weather.

.3 Launching arrangements shall enable the rescue craft to be boarded and launched directly from the stowed position with the number of persons assigned to crew the rescue craft on board.

.4 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.

.5 Rescue boat embarkation and recovery arrangements shall allow for safe and efficient handling of a stretcher. Foul weather recovery strops shall be provided if heavy fall blocks constitute a danger.

Verification Methods

22 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 23 Evacuation Arrangements

Functional Objective

1 Evacuation arrangements shall enable embarked persons to embark the survival craft as safe as reasonably practicable.

Performance Requirements

2 Evacuation arrangements:

.1 Shall allow evacuation as safe and swift as reasonably practicable;

.2 Shall be as flexible as reasonably practicable to provide for the possibility that certain evacuation arrangements may not be available as a result of fire, flooding, obstructions or other reasons;

.3 Shall allow evacuation under normal operating conditions and under the anticipated list or trim for damaged conditions;

.4 Shall be protected as far as possible from:

i. External environmental factors such as wash or green water;

ii. Vessel's weapon and sensor systems;

iii. Fire, smoke or hazardous vapours;

.5 Be free from undue hazards, such as protrusions or obstructions which could cause injury or ensnare clothing, life-jackets or personal thermal protection suits.

3 Evacuation stations:

.1 Shall be of sufficient size to accommodate all embarked persons;

.2 Shall be readily and swiftly accessed from the muster station (if provided) and normally occupied compartments.

4 Boarding equipment shall:

.1 Provide a safe means of transfer of persons into a survival craft;

.2 Be aimed at dry shod evacuation;

.3 Be suitable for the hull shape at the evacuation station and the height of the evacuation station above the waterline;

.4 Reflect the physical characteristics of the embarked persons;

.5 Be easy to operate;

.6 Be operational in the environmental conditions for the area of operations defined in the Concept of Operations Statement;

.7 Be operational in the damage conditions.

5 Unless expressly provided otherwise in this Code, boarding systems shall comply with LSA-Code Paragraph 6.1.6 “Embarkation ladders” and Paragraph 6.2 “Marine evacuation systems”.

6 The evacuation station shall have fire integrity characteristics according to Chapter VI Fire Safety.

7 The Naval Administration shall approve the following items based on a risk assessment and/or a demonstration:

.1 Evacuation arrangements shall be operational in case of maximum anticipated list or trim for damaged conditions. If these damage conditions exceed a list of 20° and a trim of 10° either way, the boarding equipment shall be proven to be operational during these conditions;

.2 Evacuation arrangements shall be safely located having particular regard to:

i. Clearance from the propeller and steeply overhanging positions of the hull and so that, as far as practicable, the boarding system can be launched down the straight side of the ship;

ii. Any ship sides openings or projections between the evacuation station and the waterline in the lightest seagoing condition or discharge points;

iii. Magazines, in particular ready use magazines on the upper deck;

.3 Evacuation stations provide protection to the persons from:
  i. External influences such as wash and green water;
  ii. Vessel's weapon, sensor systems and combat management system;
  iii. Fire, smoke and hazardous vapours;
.4 Evacuation stations shall have sufficient clear deck space to ensure free passage of persons to it.
.5 Evacuation stations shall be so arranged as to enable stretcher cases to be placed in survival craft;
.6 Evacuation arrangements shall be near to and readily accessible from normally occupied compartments.

8 As minimum there shall exist one evacuation station on each side of the vessel.

9 Evacuation stations shall be provided with handholds, anti-skid treatment of the deck and adequate space which is clear of cleats, bollards and similar fittings.

10 Boarding systems shall be adequately protected from any projections from the vessel's side.

11 As a minimum, the vessel shall carry a climbing net and an embarkation ladder on each side of single length from the deck to the waterline in the lightest seagoing condition under the anticipated list or trim for damaged conditions. The climbing net and embarkation ladder shall be ready for deployment. Along the length of the vessel there shall be sufficient number of securing points are available for attachment of climbing nets and embarkation ladders. These securing points need not be dedicated for use of the climbing nets or embarkation ladders, and may be existing structure serving another purpose.

12 When boarding is conducted after launching, the following applies:
.1 Means shall be provided for bringing survival craft against the vessel's side and holding them alongside so that persons can safely evacuate.
.2 Additional boarding systems (climbing nets, embarkation ladders or MES) shall be provided for vessels on which evacuation will take place from a height greater than 6 m. These boarding systems shall be available on both sides of the vessel and be sufficient in number to ensure the maximum times for evacuation as prescribed in Regulation 2 Approval Procedures are not exceeded. In addition they shall be suitable for the hull shape of the location where they are fitted.

Verification Methods

13 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 24 Survival Craft

Functional Objective

1 Survival craft shall provide a place of relative safety away from the damaged vessel following evacuation.

Performance Requirements

2 Survival craft shall:
.1 Be provided taking into account the number of embarked persons;
.2 Be able to manoeuvre away from the damaged vessel;
.3 Protect embarked persons from risks of the damaged vessel;
.4 Protect embarked persons against the natural environment;
.5 Provide provisions and habitability during the anticipated rescue time;
.6 Be designed for minimum motion sickness;
.7 Allow the survival craft to be readily located under different environmental conditions (e.g. weather, sea state and darkness);
.8 Be easily boarded from the water.

3 Unless expressly provided otherwise in this Code:
.1 Survival craft shall comply with LSA-Code, Chapter 4 "Survival craft". Additionally, if a boarding system is not provided to board the liferafts from the naval vessel, the floating liferaft shall be capable of withstanding repeated jumps onto it from a height of at least the distance between the evacuation deck and the waterline in lightest seagoing condition both with and without the canopy erected.
.2 Marshal boats shall comply with LSA-Code, Chapter 5 "Rescue boats", except 5.1.1.6 and 5.1.1.7. Where LSA-Code, Chapter 5 the term "rescue boat" is used, it should be read to mean "marshal boat" for the purpose of this Code.
.3 Liferafts shall be automatically self-righting or canopied reversible liferafts in accordance with IMO MSC Circular 809 "Recommendation for Canopied Reversible Liferafts, Automatically Self-righting Liferafts and Fast Rescue Boats, including testing, on Ro-Ro passenger ships".

.4 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 regulation and Regulation 7.22 Launching Arrangements.

4 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.

5 Naval vessels shall comply with the following requirements:

.1 Survival craft shall be carried with sufficient capacity as will accommodate not less than 100% of the total number of persons the vessel is certified to carry, subject to a minimum of two such survival craft being carried;

.2 In addition, survival craft shall be carried with sufficient aggregate capacity to accommodate not less than 10% of the total number of persons the vessel is certified to carry;

.3 Sufficient survival craft shall be carried to accommodate the total number of embarked persons, even in the event that all the survival craft of one side of the vessel’s centreline within the longitudinal extent of damage (defined in the Concept of Operations Statement) are considered lost or rendered unserviceable.

.4 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 m 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;

.5 A rescue boat or marshal boat may be included in the survival craft capacity, providing it complies with the requirements of survival craft.

6 So far as practicable, survival craft shall be distributed in such a manner that there is an equal capacity on both sides of the vessel.

7 Survival craft stowages shall have fire integrity characteristics according to Chapter VI Fire Safety. Survival craft stowages shall be readily and safely accessed from normally occupied compartments. These routes shall have similar characteristics as required for primary escape routes (see Regulation 17 Fixtures and Fittings on Escape Routes).

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

9 Means shall be available to prevent any discharge of water into survival craft during evacuation.

10 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.

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

.1 The vessel shall carry sufficient marshal boats to ensure that, in providing for abandonment by the total number of persons the vessel is certified to carry:

i. Not more than nine survival craft need be marshalled by each marshal boat; or

ii. If the Naval Administration is satisfied that the marshal boats are capable of towing a pair of such survival craft simultaneously, not more than twelve survival craft need be marshalled by each marshal boat; or

iii. 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 Regulation 2 Approval Procedures.

.2 Marshal craft shall have sufficient mobility and manoeuvrability in a seaway to marshal survival craft and tow the largest survival craft carried on the vessel when loaded with its full complement of persons and equipment or as equivalent at a speed of at least two knots.

12 All survival craft on board vessels carrying cargoes such as oil, chemicals or gas having a flashpoint not exceeding 60°C (closed-cup test) which are required by this Regulation shall be fire-protected lifeboats complying with the requirements of Paragraph 4.9 of the LSA-Code.

Verification Methods

13 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 25 Life-Jackets

Functional Objective

1 Life-jackets shall provide effective flotation assistance for persons over board.

Performance Requirements

2 A life-jacket shall:

.1 Turn unconscious drowning persons face-up thereby lifting the mouth above the water and protect the face from waves and sea-spray;

.2 Be provided to accommodate the full range of physical characteristics of embarked persons;

.3 Be sufficiently provided relating to the number of embarked persons;

.4 Be compatible with the personal thermal protection suits or other PPE that embarked persons may be wearing during evacuation;

.5 Allow the person over board to be readily located under different environmental conditions (e.g. weather, sea state and at all times of day).

3 Unless expressly approved by the Naval Administration, life-jackets shall comply with LSA-Code Paragraph 2.2 “Lifejackets”.

4 Life-jackets shall incorporate a screen to provide protection from waves and sea-spray to the person overboard.

5 The life-jackets 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 demonstrated.

6 For special purposes, alternative colours and retro-reflective material arrangements on the life-jackets may be approved by the Naval Administration. The inflated part shall, however, always comply with the colour and retro-reflective material requirements stated in the LSA-Code.

7 If a boarding system is not carried for evacuation into life rafts, life-jackets shall be constructed to enable the wearer to jump from the evacuation station into the sea, without injury and without dislodging or damaging the life-jacket.

8 A life-jacket shall be issued individually to every embarked person. Additional life-jackets shall be carried for 50% 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.

9 Alternatively, life-jackets shall be stowed in at least two separated, conspicuous, readily accessible places on the upper deck as near as practicable to the evacuation stations. The number of life-jackets stored per cluster shall equal 110% of the total number of persons assigned to the survival craft served by that evacuation station. Clustered life-jackets shall be stowed so that their distribution and donning does not impede any other escape or evacuation activity.

10 Additionally, a sufficient number of life-jackets shall be carried for persons on watch. The number of the life-jackets 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.

11 The Naval Administration shall approve the number and type of life-jackets:

.1 For use in amphibious operations and in conjunction with stretchers when transferring patients at sea. When persons are carrying heavy equipment attached to their person, the requirements for the life-jackets may be enhanced by the Naval Administration;

.2 For embarked persons who are at greater risk of falling over board during normal operations, such as rescue craft crew, replenishment at sea teams, flight crew.

Verification Methods

12 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 26 Personal Thermal Protection Suits

Functional Objective

1 Personal thermal protection suits shall help prevent hypothermia and/or cold shock during Evacuation and Rescue activities.

Performance Requirements

2 Personal thermal protection suits shall:

.1 Be designed to provide protection from cold shock and hypothermia;

.2 Maintain life support for the envisaged rescue time;

.3 Be accommodate the full range of physical characteristics of embarked persons;

.4 Be unpacked and donned easy, swift, without assistance;

.5 Not hinder the person wearing it to conduct evacuation and rescue activities;

.6 Remain functional during the evacuation and rescue process;

.7 Not hinder the person wearing it to don a life-jacket, if not combined in the thermal protection suit.

.8 Not hinder the person wearing it to swim a short distance through the water and board a survival craft.

3 Unless expressly provided otherwise in this Code, personal thermal protection suits shall comply with the LSA-Code Paragraphs 2.3 “Immersion suits” and 2.4 “Anti-exposure suits”. Additionally, if a boarding system is not carried for evacuation of the naval vessel, personal thermal protection suits shall be constructed with water proof materials such that following a jump from the evacuation station into the seawater there is no undue ingress of water into the suit.

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

5 The number and location of immersion suits on board shall be similar to the requirements of life-jackets, unless:

.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 life-jackets.

.2 The vessel is constantly engaged on voyages in warm climates where, in the opinion of the Naval Administration, immersion suits are unnecessary. Refer to IMO MSC Circular 1046 “Guidelines for Assessment of Thermal Protection”.

6 If a ship has any watch or work stations located remotely from the places where the personal thermal protection suits are normally stowed, additional immersion suits shall be provided at these locations for the number of persons normally on watch or working at those locations at any time.

7 Additionally, anti-exposure suits shall be provided for every person assigned to crew the rescue boat or assigned to the MES party.

8 Personal thermal protection suit stowages shall be adjacent to muster stations (if provided) or survival craft to permit easy distribution of the suits. Personal thermal protection suits shall be so placed as to be readily accessible and their position shall be plainly indicated.

Verification Methods

9 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

Regulation 27 Rescue Arrangements

Functional Objective

1 Rescue arrangements shall enable persons to be rescued from the sea, rescue units or survival craft.

Performance Requirements

2 Rescue arrangements shall:

.1 Permit effective and rapid rescue of persons over board;

.2 Minimise the risk levels imposed on the rescue crew;

.3 Be provided taking into account the physical characteristics of embarked persons;

.4 Permit the mass rescue of persons from another vessel.

Rescue Boat Arrangements

3 Unless expressly provided otherwise in this Code, rescue boats shall comply with:

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

.2 LSA-Code Chapter 5 “Rescue boats”.

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

4 Generally, naval vessels shall carry at least one rescue boat, unless:

.1 The Naval Administration is satisfied that an adequate standard of safety is attained;

.2 The naval vessel is sufficiently manoeuvrable, arranged, and equipped to allow the embarked persons to recover a person over board;

.3 Recovery of a person overboard can be observed from the operating station;

.4 The vessel does not regularly engage in operations that restrict its manoeuvrability.

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

6 A lifeboat or marshal craft may be accepted as a rescue boat provided it also complies with the requirements of a rescue boat.

7 A rescue boat shall permit taking an unconscious embarked person without capsizing.

8 The rescue boat shall allow for safe and efficient handling of a stretcher case.

Swimmer of the Watch

9 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. With the following exceptions:

.1 The vessel is sufficiently manoeuvrable, arranged, and equipped to allow the embarked persons to recover a person over board;

.2 A vessel with a freeboard greater than 12 m.

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

.1 One-man lift, in which the casualty and the swimmer are hoisted on board in turn, using the helicopter strop;

.2 Two-man lift, (Ashanti rig), which uses a double harness to hoist the casualty and the swimmer simultaneously.

11 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 270 kg. NOTE all rigging equipment shall be tested and certificates raised.

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

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

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

.3 The helicopter strop shall be stowed such that it is protected from the elements, and readily available.

Mass rescue

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

.1 A climbing net from which persons can easily embark the naval vessel; or

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

.3 A device complying with the requirements for davit launched lifeboat.

Line-throwing appliance

14 One line-throwing appliance shall be carried to assist with the recovery of persons over board. The line-throwing appliance shall comply with the requirements of LSA-Code Paragraph 7.1 “Line-throwing appliances”.

Lifebuoys

15 The minimum number of lifebuoys carried by a naval vessel shall be 2 for every 20 m of vessel length or part thereof, with a minimum of 8. Lifebuoys shall comply with the requirements of LSA-Code Paragraph 2.1.1 “Lifebuoy specification”.

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

17 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.

18 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.

19 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.

20 At least one lifebuoy on each side of the vessels shall be fitted with buoyant lines of length to not less than twice the height at which it is stowed above the waterline in the lightest seagoing condition, or 30 m, whichever is the greater and comply with the requirements of LSA-Code Paragraph 2.1.4 “Buoyant lifelines”.

21 Not less than half of the total number of lifebuoys shall be provided with lifebuoy self-igniting lights complying with the requirements of LSA-Code Paragraphs 2.1.2 “Lifebuoy self-igniting lights” with a minimum of 6; not less than two of these shall also be provided with lifebuoy self-activating smoke signals complying with the requirements of LSA-Code 2.1.3 “Lifebuoy self-activating smoke signals” and be capable of quick release from the navigation bridge.; lifebuoys with lights and those with lights and smoke signals shall be equally distributed on both sides of the vessels and shall not be the lifebuoys provided with lifelines in compliance with the requirements of Regulation 26 Personal Thermal Protection Suits.

22 Each lifebuoy shall be marked in block capitals of the Roman alphabet with the name of the ship.

23 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.

Verification Methods

24 The ship, systems and equipment are to be approved in accordance with the above Performance Requirements. The Naval Administration may agree equivalent or supplementary standards, criteria and/or procedures to facilitate verification.

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