MARITIME AND PORT AUTHORITY OF SINGAPORE
SHIPPING CIRCULAR TO SHIPOWNERS NO. 17 OF 2013

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Applicable to: This circular is for the attention of ship owners, managers, operators, agents, masters, crew members and surveyors

RESOLUTIONS ADOPTED BY THE 92ND SESSION OF THE MARITIME SAFETY COMMITTEE (MSC 92) OF INTERNATIONAL MARITIME ORGANIZATION

1. This circular informs the Shipping Community of the resolutions adopted by MSC 92 (12 to 21 June 2013) and urges the Community to prepare for the implementation of these resolutions.

2. The resolutions adopted by MSC 92 include the following:

a. **Resolution MSC.349 (92) – Adoption of the Code for Recognized Organizations (RO Code)**

The resolution adopts the RO Code which provides Flag States with an international standard that will assist in achieving harmonized and consistent global implementation of requirements for the assessment and authorization of Recognized Organizations (ROs).

The RO Code will enter into force on **1 January 2015**.

b. **Resolution MSC.350(92) – Adoption of amendments to the International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS 74)**

The resolution adopts the following amendments to SOLAS 74, and will enter into force on **1 January 2015**:

i. *Regulation III/19 – Emergency training and drills*

The amendment requires the musters of newly-embarked passengers to take place prior to or immediately upon

departure on ships engaged on voyages with passengers scheduled to be on board for more than 24hrs. Passengers shall also be instructed in the use of the lifejackets and the actions to take in an emergency.

In addition, crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill to be held on board the ship at least once every two months. Risks associated with enclosed spaces and onboard procedures for safe entry into such spaces shall be considered, taking into account A.1050(27) of the revised recommendations for entering enclosed spaces onboard ships.

ii. *Regulation V/19 – Carriage requirements for shipborne navigational systems and equipment*

The amendment serves to address the unintended omission of Bridge Navigational Watch Alarm System (BNWAS) for ships constructed before 1 July 2002. Ships constructed before 1 July 2002 are now mandated to be fitted with BNWAS in accordance to the specified schedule. A new clause is also added to allow Administrations to exempt these ships from the application of the requirement when they will be taken permanently out of service within two years after the implementation date.

iii. *Regulation XI-1/1– Authorization of recognized organizations*

This resolution amends SOLAS regulation XI-1/1 in order to make parts 1 and 2 of the RO Code mandatory under the provisions of the SOLAS Convention.

c. **Resolution MSC.351(92) – Adoption of amendments to the International Code of Safety for High-Speed Craft, 1994 (1994 HSC Code)**

The resolution is adopted in conjunction with the relevant amendments to SOLAS regulation III/19 related to enclosed space entry and rescue drills. Crew members involved in enclosed space entry or with rescue responsibilities shall participate in an enclosed space entry and rescue drills, to be held on board the ship at least once every two months. The amendments will enter into force on **1 January 2015**.

d. **Resolution MSC.352(92) – Adoption of amendments to the International Code of Safety for High-Speed Craft, 2000 (2000 HSC Code)**

The resolution adopts amendments similar to resolution MSC.351(92) adopted for 1994 HSC Code. The amendments will enter into force on **1 January 2015**.

e. **Resolution MSC.353(92) – Adoption of amendments to the International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code)**

The resolution adopts amendments to paragraph 6 and 12 of the ISM Code. The company is to ensure that the ship is appropriately manned in order to encompass all aspects of maintaining safe operations on board, and is also required to periodically verify whether all those undertaking delegated ISM-related tasks are acting in conformity with the Company's responsibilities. The amendments will enter into force on **1 January 2015**.

f. **Resolution MSC.354(92) – Adoption of amendments to the International Maritime Solid Bulk Cargoes (IMSBC) Code**

The IMSBC Code is regularly amended every two years to improve the safety of ships carrying solid bulk cargoes. Ships carrying solid bulk cargoes should take note of the amendments and implement them accordingly. The amendments will enter into force on **1 January 2015**.

MPA encourages the application of the amendments in whole or in part on a voluntary basis from **1 January 2014**.

g. **Resolution MSC.356(92) – Adoption of amendments to the Protocol of 1988 relating to the International Convention on Load Lines, 1966, as amended**

The amendment relates to the 1988 Load Lines Protocol, in order to make parts 1 and 2 of the RO Code mandatory under the provisions of the 1988 Load Lines Protocol. The amendments will enter into force on **1 January 2015**.

h. **Resolution MSC.357(92) – Adoption of amendments to the Code for the Construction and Equipment of Mobile Offshore Drilling Units (MODU Code)**

The resolution is adopted in conjunction with the relevant amendments to SOLAS regulation III/19 related to enclosed space entry and rescue drills. Shipping Circular No. 6 of 2005 informs that all mobile offshore industry units would have to comply with the MODU Code promulgated by the IMO. The provisions for enclosed space entry and rescue drills adopted by this resolution shall therefore be regarded as mandatory. The amendments will take effect from **1 January 2015**.

i. **Resolution MSC.358(92) – Adoption of amendments to the Code for the Construction and Equipment of Mobile Offshore Drilling Units, 1989 (1989 MODU Code)**

The amendments adopted are similar to resolution MSC.357(92) and resolution MSC.359(92), and will take effect on **1 January 2015**.

j. **Resolution MSC.359(92) – Adoption of amendments to the Code for the Construction and Equipment of Mobile Offshore Drilling Units, 2009 (2009 MODU Code)**

The amendments adopted are similar to resolution MSC.357(92) and resolution MSC.358(92), and will take effect on **1 January 2015**.

k. **Resolution MSC.360(92) – Adoption of amendments to the Code of Safety for Dynamically Supported Craft (DSC Code)**

The resolution is adopted in conjunction with the relevant amendments to SOLAS regulation III/19 related to enclosed space entry and rescue drills and shall be regarded as mandatory. The amendments will take effect from **1 January 2015**.

l. **Resolution MSC.362(92) – Adoption of the Revised Recommendation on a Standard Method for Evaluating Cross-flooding Arrangements**

The recommendation on a standard method for evaluating cross-flooding arrangements is revised and improved for evaluating cross-flooding arrangements on ships subject to the applicable subdivision and damage stability requirements of SOLAS chapter II-1. The resolution was adopted and applicable on **14 June 2013**.

m. **Resolution MSC.363(92) – Adoption of Performance Standards for Electronic Inclinometers**

The resolution adopts the Performance Standards for electronic inclinometers. All electronic inclinometers installed **on or after 1 July 2015**, shall conform to performance standards not inferior to those specified in resolution MSC.363(92).

3. The details of the resolutions can be found in the reports of MSC 92 which are available from the MPA website.

4. In addition to the adoption of resolutions, MSC 92 also approved the following **Unified Interpretations**;

a. MSC.1/Circ.1456 – Unified interpretations of SOLAS chapter II-2 and the FSS and FTP Codes

b. MSC.1/Circ.1457 – Unified interpretation of the 2000 HSC Code, as amended by resolutions MSC.175(79) and MSC.222(82)

c. MSC.1/Circ.1458 – Unified interpretation of the revised guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms (MSC/Circ.1165)

d. MSC.1/Circ.1459 – Unified interpretations of the SOLAS Convention and the IBC and IGC Codes

e. MSC.1/Circ.1464 – Unified interpretations of the provisions of SOLAS chapters II-1 and XII, the technical provisions for means of access for inspections (resolution MSC.158(78)) and of the performance standards for water level detectors on bulk carriers (resolution MSC.145(77))

f. MSC.1/Circ.1465 – Unified interpretation of the performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers (resolution MSC.215(82))

g. MSC.1/Circ.1466 – Unified interpretations on fall preventer devices (MSC.1/Circ.1392 and MSC.1/Circ.1327)

h. MSC.1/Circ.1467 – Unified interpretation of SOLAS regulation II-1/26.3

i. MSC.1/Circ.1468 – Unified interpretation of paragraph 1.1.4 of the LSA Code

The Unified Interpretations and clarifications are acceptable to MPA and should be followed and applied in accordance with the recommended application date mentioned in the circulars. Ship owners are further advised to approach the nine approved Classification Societies to seek further guidance.

5. Queries relating to this circular should be directed to Mr. Calvin Lee via Telephone 6375-6269 or email calvin_lee@mpa.gov.sg. For queries on compliance with the respective resolutions, please contact the vessel's classification society.

CHEONG KENG SOON
DIRECTOR OF MARINE
MARITIME AND PORT AUTHORITY OF SINGAPORE

ANNEX 1

RESOLUTION MSC.349(92)
(Adopted on 21 June 2013)

CODE FOR RECOGNIZED ORGANIZATIONS (RO CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.739(18) entitled *Guidelines for the authorization of organizations acting on behalf of the Administration*, as amended by resolution MSC.208(81), and resolution A.789(19) entitled *Specifications on the survey and certification functions of recognized organizations acting on behalf of the Administration*, which have become mandatory under chapter XI-1 of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the 1974 SOLAS Convention"), under chapter I of annex I to annex B of the Protocol of 1988 relating to the International Convention on Load Lines, 1966 (hereinafter referred to as "the 1988 Load Lines Protocol"), and under Annex I and Annex II of the MARPOL Convention,

RECOGNIZING the need to update the aforementioned resolutions, gather all the applicable requirements for recognized organizations in a single IMO mandatory instrument and assist in achieving harmonized and consistent global implementation of requirements established by IMO instruments for the assessment and authorization of recognized organizations,

RECOGNIZING ALSO the need for a code to provide, as far as national laws allow, a standard approach to assist the Administrations in meeting their responsibilities in recognizing, authorizing and monitoring their recognized organizations,

NOTING resolutions MSC.350(92) and MSC.356(92), by which it adopted, inter alia, amendments to the 1974 SOLAS Convention and to the 1988 Load Lines Protocol, respectively, to make the provisions of part 1 and part 2 of the Code for recognized organizations mandatory under the 1974 SOLAS Convention and the 1988 Load Lines Protocol,

NOTING ALSO resolution MEPC.237(65) by which the Marine Environment Protection Committee adopted the Code for recognized organizations to be made mandatory under annex I and annex II of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973,

HAVING CONSIDERED, at its ninety-second session, the text of the proposed Code for recognized organizations,

CONSIDERING that it is highly desirable for the Code for recognized organizations made mandatory under the MARPOL Convention, the 1974 SOLAS Convention and the 1988 Load Lines Protocol to remain identical,

1. ADOPTS the Code for recognized organizations (RO Code), the text of which is set out in the annex to the present resolution;

2. INVITES Contracting Governments to the 1974 SOLAS Convention and Parties to the 1988 Load Lines Protocol to note that the RO Code will take effect on 1 January 2015 upon the entry into force of the respective amendments to the 1974 SOLAS Convention and 1988 Load Lines Protocol;

3. REQUESTS the Secretary-General to transmit certified copies of the present resolution and the text of the RO Code contained in the annex to all Contracting Governments to the 1974 SOLAS Convention and Parties to the 1988 Load Lines Protocol;

4. ALSO REQUESTS the Secretary-General to transmit copies of this resolution and the annex to all Members of the Organization which are not Contracting Governments to the 1974 SOLAS Convention or Parties to the 1988 Load Lines Protocol;

5. RECOMMENDS Governments concerned to use the recommendatory provisions contained in part 3 of the RO Code as a basis for relevant standards, unless their national requirements provide at least an equivalent degree of safety.

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ANNEX

CODE FOR RECOGNIZED ORGANIZATIONS (RO CODE)

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PREAMBLE

The *Code for Recognized Organizations (RO Code)* was adopted by the Organization by resolutions MSC.349(92) and MEPC.237(65).

This Code:

.1 provides flag States with a standard that will assist in achieving harmonized and consistent global implementation of requirements established by the instrument of the International Maritime Organization (IMO) for the assessment and authorization of recognized organizations (ROs);

.2 provides flag States with harmonized, transparent and independent mechanisms, which can assist in the consistent oversight of ROs in an efficient and effective manner; and

.3 clarifies the responsibilities of organizations authorized as ROs for a flag State and overall scope of authorization.

PART 1

GENERAL

1 PURPOSE

The Code serves as the international standard and consolidated instrument containing minimum criteria against which organizations are assessed towards recognition and authorization and the guidelines for the oversight by flag States.

2 SCOPE

2.1 The Code applies to:

.1 all organizations being considered for recognition or that are recognized by a flag State to perform, on its behalf, statutory certification and services under mandatory IMO instruments and national legislation; and

.2 all flag States that intend to recognize an organization to perform, on their behalf, statutory certification and services under mandatory IMO instruments.

2.2 The Code establishes:

.1 the mandatory requirements that an organization shall fulfil to be recognized by a flag State (part 1);

.2 the mandatory requirements that an RO shall fulfil when performing statutory certification and services on behalf of its authorizing flag States (part 2);

.3 the mandatory requirements that flag States shall adhere to when authorizing an RO (part 2); and

.4 guidelines for flag State oversight of ROs (part 3).

2.3 The Code defines the functional, organizational and control requirements that apply to ROs conducting statutory certification and services performed under mandatory IMO instruments, such as, but not limited to, SOLAS, MARPOL and the Load Lines Conventions.

2.4 All requirements of the Code are generic and applicable to all ROs, regardless of their type and size and the statutory certification and services provided.

2.5 ROs subject to this Code need not offer all types of statutory certification and services and may have a limited scope of recognition, provided that the requirements of this Code are applied in a manner that is compatible with the limited scope of recognition. Where any requirement of this Code cannot be applied due to the scope of services delivered by an RO, this shall be clearly identified by the flag State and recorded in the RO's quality management system.

3 CONTENTS

The Code consists of three parts. Part 1 contains general provisions. Part 2 contains mandatory provisions for the flag State and RO as already contained in relevant IMO instruments and applicable international standards. Part 3 contains guidelines for the oversight of ROs by flag States.

4 DELEGATION OF AUTHORITY

4.1 A flag State may delegate authority to an organization recognized as complying with the provisions of this Code to perform, on its behalf, statutory certification and services under mandatory IMO instruments and its national legislation.

4.2 The flag State shall not authorize functions beyond RO's capabilities. In this respect, the flag State shall take into consideration appendix 2 of this Code for authorization.

4.3 Flag States should cooperate with each other with the objective of ensuring that ROs to whom they delegate authority adhere to the provisions of this Code.

5 COMMUNICATION OF INFORMATION

The flag State shall communicate to, and deposit with, the Secretary-General of IMO a list of ROs for circulation to the interested parties for information of their officers, and a notification of the specific responsibilities and conditions of the authority delegated to ROs.

6 REFERENCES

The Code is based on the following referenced documents:

.1 mandatory IMO instruments and IMO Guidelines and recommendations (i.e. Codes, guidelines and standards recommended by the Organization);

.2 ISO 9000:2005, Quality Management Systems – Fundamentals and vocabulary;

.3 ISO 9001:2008, Quality Management Systems – Requirements;

.4 ISO/IEC 17020:1998, General criteria for the operation of various types of bodies performing inspection;

.5 ISO 19011:2002, Guidelines for quality and/or environmental management systems auditing;

.6 International Association of Classification Societies (IACS) Quality Management System Requirements (QMSR); and

.7 national legislation.

PART 2

RECOGNITION AND AUTHORIZATION REQUIREMENTS FOR ORGANIZATIONS

1 TERMS AND DEFINITIONS

1.1 *Recognized organization (RO)* means an organization that has been assessed by a flag State, and found to comply with this part of the RO Code.

1.2 *Authorization* means the delegation of authority to an RO to perform statutory certification and services on behalf of a flag State as detailed in an agreement or equivalent legal arrangement taking into account the " Elements to be included in an Agreement" as set out in appendix 3 of this Code.

1.3 *Statutory certification and services* means certificates issued, and services provided, on the authority of laws, rules and regulations set down by the Government of a sovereign State. This includes plan review, survey, and/or audit leading to the issuance of, or in support of the issuance of, a certificate by or on behalf of a flag State as evidence of compliance with requirements contained in an international convention or national legislation. This includes certificates issued by an organization recognized by the flag State in accordance with the provisions of SOLAS regulation XI-1/1, and which may incorporate demonstrated compliance with the structural, mechanical and electrical requirements of the RO under the terms of its agreement of recognition with the flag State.

1.4 *Assessment* means any activity to determine that the assessed entity fulfils the requirements of the relevant rules and regulations.

1.5 *Interested parties* means any person or legal entity who can demonstrate a justified interest in the survey and certification process and includes, inter alia, clients of the RO, shipowners, ship operators, shipbuilders, equipment manufacturers, shipping industry interests or associations, marine insurance interests or associations, trade associations, governmental regulatory bodies or other governmental services and non-governmental organizations.

1.6 *Location* is a place from which surveys are carried out and managed, or where plan approval is carried out, or from which processes are managed.

1.7 *Site* is the place at which a surveyor is based to cover a specific contract or a series of contracts including; but not limited to, a port, shipyard, firm, and company. All statutory certification and services at sites are to be controlled by a location.

1.8 A *Vertical Contract Audit (VCA)* is a contract/order specific audit of production processes, including witnessing work during attendance at a survey, audit or plan approval in progress and, as applicable, including relevant sub-processes. A VCA is carried out at a location or a site (Survey Station/Approval Office/Site) to verify the correct application of

relevant requirements in service realization for the specific work in that contract/order, and their interactions (relevant sub-processes include e.g. previous part surveys or UTM processes connected to the survey). Plan approval VCA may be carried out for completed tasks.

2 GENERAL REQUIREMENTS FOR RECOGNIZED ORGANIZATIONS

2.1 General

Delegation of authority by a flag State to an organization shall be subject to the confirmation of the capability of that organization to demonstrate that it has the capacity to deliver high standards of service and its compliance with the requirements of this Code and applicable national legislation.

2.2 Rules and regulations

The RO shall establish, publish and systematically maintain its rules or regulations, a version of which shall be provided in the English language, for the design, construction and certification of ships and their associated essential engineering systems as well as provide for adequate research capability to ensure appropriate updating of the published criteria.

2.3 Independence

The RO and its staff shall not engage in any activities that may conflict with their independence of judgement and integrity in relation to their statutory certification and services. The RO and its staff responsible for carrying out the statutory certification and services shall not be the designer, manufacturer, supplier, installer, purchaser, owner, user or maintainer of the item subject to the statutory certification and services, nor the authorized representative of any of these parties. The RO shall not be substantially dependent on a single commercial enterprise for its revenue.

2.4 Impartiality

2.4.1 The personnel of ROs shall be free from any pressures, which might affect their judgement in performing statutory certification and services. Procedures shall be implemented to prevent persons or organizations external to the organization from influencing the results of services carried out.

2.4.2 All potential customers shall have access to statutory certification and services provided by the RO without undue financial or other conditions. The procedures under which the RO operates shall be administered in a non-discriminatory manner.

2.5 Integrity

The RO shall be governed by the principles of ethical behaviour, which shall be contained in a Code of Ethics. The Code of Ethics shall recognize the inherent responsibility associated with a delegation of authority to include assurance of adequate performance of services.

2.6 Competence

The RO shall perform statutory certification and services by the use of competent surveyors and auditors who are duly qualified, trained and authorized to execute all duties and activities incumbent upon their employer, within their level of work responsibility.

2.7 Responsibility

The RO shall define and document the responsibilities, authorities, qualifications and interrelation of personnel whose work affects the quality of its services.

2.8 Transparency

2.8.1 Transparency reflects the principle of access to, or disclosure of, all information related to the statutory certification and services carried out by the RO on behalf of a flag State.

2.8.2 The ROs shall communicate information to the flag State as described in the section on communication/cooperation with the flag State.

2.8.3 Information concerning the status of ships certified by ROs shall be made available to the public.

3 MANAGEMENT AND ORGANIZATION

3.1 General

The RO shall, based on the provisions of this Code, develop and implement a quality management system and shall continually improve its effectiveness.

3.2 Quality, safety and pollution prevention policy

The RO shall define and document its policy and objectives for, and commitment to, quality, safety and pollution prevention. In particular, the RO's management shall:

.1 ensure that the policy and objectives are established;

.2 ensure the policy and objectives are appropriate for the purpose of the organization;

.3 communicate the policy and objectives; including provisions applicable to the statutory certification and services, to the organization and ensure that it is understood within the organization;

.4 ensure sufficient availability of resources;

.5 include a commitment to comply with all applicable requirements and continually improve the effectiveness of the quality management system;

.6 conduct management reviews; which includes a framework for reviewing quality objectives; and

.7 review the quality policy, objectives and the quality management system for continuing suitability.

3.3 Documentation requirements

3.3.1 The quality management system shall include the following documentation:

.1 quality policy and quality objectives;

.2 quality manual (refer to section 3.4);

.3 procedures and records required by this Code and the national legislation of the recognizing flag State;

.4 procedures to ensure the effective planning, operation, and control of the RO's processes;

.5 rules and regulations as applicable to the RO's areas of authorization;

.6 list of ships for which statutory certification and services are provided;

.7 other documented process procedures that are considered necessary (these include any circulars or letters, which provide the surveyors and administrative staff with up-to-date information on classification, statutory and related matters);

.8 specifications and diagrams defining or amplifying service processes; and

.9 pro-forma reports, checklists and certificates appropriate to the activities covered by this certification.

3.3.2 The quality management system shall also include external documents, such as:

.1 national and international standards necessary for the activities governed by this instrument;

.2 IMO Conventions and resolutions;

.3 national shipping regulations and standards appropriate to the authorization of the RO;

.4 documents and data submitted to the RO for verification and/or approval; and

.5 specified correspondence defined by the RO to be of an important nature.

3.4 Quality manual

The RO shall establish and maintain a quality manual that includes:

.1 scope of the quality management system, including details of, and justification for any exclusions;

.2 management statement on its policy and objectives for, and commitment to, quality;

.3 description of the RO's areas of activity and competence;

.4 general information about the organization and its head office (name, address, phone number, etc., and legal status);

.5 information on the RO's relationship to its parent or associated organizations (where applicable);

.6 charts describing the organization's structure;

.7 management statement assigning a person designated who is responsible for the organization's quality management system;

.8 relevant job descriptions;

.9 policy statement on qualification and training of personnel;

.10 documented procedures established for the quality management system, or reference to them;

.11 description of the interaction between processes of the quality management system; and

.12 description of all other documents required by the quality management system.

3.5 Control of documents

3.5.1 Documents required by the quality management system shall be controlled. The provision of document control shall apply to any type of document, including but not limited to; electronic media and IT applications where said electronic media may affect the reliability of the service or of the recorded data.

3.5.2 A documented procedure shall be established to define the controls needed to:

.1 approve documents for adequacy prior to issue;

.2 review and update as necessary and re-approve documents;

.3 ensure that changes and the current revision status of documents are identified;

.4 ensure that relevant versions of applicable documents are available at points of use;

.5 ensure that documents remain legible and readily identifiable;

.6 ensure that documents of external origin determined by the RO to be necessary for the planning and operation of the quality management system are identified and their distribution is controlled; and

.7 prevent the unintended use of obsolete documents, and to apply suitable identification if they are retained for any purpose.

3.6 Control of records

3.6.1 Records shall be established to provide evidence of conformity to requirements of this Code and of the effective operation of the quality management system. The records shall be controlled.

3.6.2 The RO shall establish a documented procedure to define the controls needed for the identification, storage, protection, retrieval, retention, and disposition of records. Records shall remain legible, readily identifiable and retrievable.

3.6.3 The RO shall ensure that records are maintained, demonstrating achievement of the required standards in the terms covered by the statutory certification and services performed as well as the effective operation of the quality management system. Records, other than those set out in 3.6.4.2, shall be retained at least for the period for which statutory certification and services are provided by the RO. Records specified in 3.6.4.2 for a ship shall be retained for a minimum period of three years beyond the period for which statutory certification and services are provided by the RO to that ship, or a longer period if specified in the agreement between the flag State and the RO.

3.6.4 Records shall include at least those relevant to:

.1 rules and regulations development and associated research;

.2 the application of the rules and regulations and statutory requirements through:

.1 verification and/or approval of documents and/or drawings relevant to the design;

.2 approval and survey of materials and equipment;

.3 survey during construction and installation;

.4 survey during service; and

.5 issuance of certificates;

.3 the list of ships; and

.4 all other records required by this quality management system and any additional requirements established by the recognizing flag State.

3.7 Planning

3.7.1 The RO shall ensure that quality objectives, including those needed to meet the requirements for statutory certification and services are established at relevant functions and levels within the organization.

3.7.2 The quality objectives shall be measurable and consistent with the quality policy.

3.7.3 The RO shall in its planning consider the elements identified below, and use the result to evaluate the effectiveness of its standards and procedures and their impact on safety of life and property and the marine environment:

.1 that the planning of the quality management system is carried out in order to meet the requirements of the mandatory IMO Instruments, including but not limited to this Code, its quality management system and the authorizing flag State's national legislation;

.2 that the integrity of the quality management system is maintained when changes to the quality management system are planned and implemented;

.3 that the needs and expectations of the customers and other interested parties are taken into account, e.g. feedback from IMO, flag States and industry associations;

.4 the effectiveness of services based on statistics from port State control, casualties, loss trends and feedback obtained from internal and external users;

.5 the performance of the quality management system processes based on feedback from internal audits, non-conformities and internal comments;

.6 lessons learned from previous experience and deriving from an examination of survey reports, casualty investigations or external sources; and

.7 other sources of information which identifies opportunities for improvement.

3.7.4 The RO shall identify and plan the processes required for the quality management system, and determine the sequence and interaction of these processes.

3.7.5 The RO shall determine the requirements to be complied with and the criteria to ensure both the operation and control of these processes, including the criteria for acceptance, and evaluate the resources needed.

3.7.6 The RO shall plan and develop the processes required for statutory certification and services. Planning of the delivery of statutory certification and services shall be consistent with the requirements of other processes of the quality management system.

3.7.7 In planning the delivery of statutory certification and services, the RO shall determine the following as appropriate:

.1 quality objectives and requirements for statutory certification and services;

.2 the need to establish processes and documents, and to provide resources specific to the activity;

.3 required verification, validation, monitoring, measurement, inspection and test activities and the criteria for acceptance; and

.4 records needed to provide evidence that statutory certification and services meet the quality management system requirements; the requirements set out in the Code and the national legislation of the recognizing flag State.

3.7.8 The output of this planning shall be in a form suitable for the RO's structure and method of operations. The output of the planning should consider:

.1 responsibility and authority for developing improvement plans;

.2 skills and knowledge needed;

.3 improvement approaches, methodology and tools;

.4 resource requirements;

.5 alternative planning needs;

.6 indicators for performance achievements; and

.7 the need for documentation and records.

3.8 Organization

3.8.1 The relative size, structure, experience, and capability of the RO shall be commensurate with the type and degree of the statutory certification and services authorized by the flag State.

3.8.2 The RO shall demonstrate that it has the technical, administrative, and managerial competence and capacity to ensure the provision of quality services in a timely manner.

3.8.3 The RO shall appoint a member of its management who, irrespective of other responsibilities, shall have responsibility and authority that includes:

.1 ensuring that processes needed for the quality management system are established, implemented, and maintained;

.2 ensuring that processes required for the effective delivery of statutory certification and services are established, implemented and maintained;

.3 reporting to top management on the performance of the quality management system; the delivery of statutory certification and services and any need for improvement; and

.4 ensuring the promotion of awareness of all requirements throughout the RO.

3.8.4 The RO shall ensure that the responsibilities and authorities are defined and communicated within the RO.

3.9 Communication

3.9.1 *Internal communication*

The RO shall ensure that appropriate communication processes are established within the RO and that communication takes place regarding the effectiveness of the quality management system and statutory certification and services provided.

3.9.2 *Communication/cooperation with flag State*

3.9.2.1 The RO shall establish appropriate communication processes with the authorizing flag State that, inter alia, address the following:

.1 information specified by the flag State in terms of authorization;

.2 classification of ships (assignments of class, changes and withdrawals), as applicable;

.3 cases where a ship did not in all respects remain fit to proceed to sea without danger to the ship or persons on board or presenting unreasonable threat of harm to the marine environment;

.4 information on all overdue surveys, overdue recommendations or overdue conditions of class, operating conditions or operating restrictions issued against their classed ships that shall be made available upon request by the authorizing flag State; and

.5 other information as so specified by the authorizing flag State.

3.9.2.2 The RO shall allow participation in the development of its rules and/or regulations by the flag State.

3.9.2.3 The RO shall determine, propose and, if agreed by the flag State, implement effective arrangements for communicating with a flag State in relation to:

.1 enquiries, contracts or other handling, including amendments; and

.2 flag State feedback, including conformity issues pertaining to statutory certification and services.

3.9.3 *Cooperation between ROs*

3.9.3.1 Under the framework established by the flag State, the ROs shall cooperate and share relevant experience with other ROs with the view to standardizing processes concerning statutory certification and services for the flag State, as appropriate.

3.9.3.2 Under the framework established by a flag State or a group of flag States, the organizations recognized by this State or these States shall establish and maintain appropriate technical and safety-related cooperation processes regarding statutory certification and services of ships, which may affect the validity of certificates issued by other ROs either in whole or in part on behalf of the said flag State(s). Flag States shall seek to mutually cooperate in order to ensure, as far as practicable, the compatibility of their respective frameworks.

3.9.3.3 No flag State shall mandate its ROs to apply to ships, other than those entitled to fly its flag, any requirement pertaining to their classification rules, requirements, procedures or performance of other statutory certification processes, beyond convention requirements and the mandatory instruments of the IMO.

3.9.3.4 In cases of transfer of the certification of the ship from one RO to another, the losing organization shall, without undue delay, provide the gaining organization access to the history file of the ship including:

.1 any overdue surveys;

.2 any overdue recommendations and overdue conditions of class;

.3 operating conditions issued against the ship;

.4 operating restrictions issued against the ship; and

.5 technical information, drawings, plans and documents taking into account the relevant guidelines developed by the Organization[1].

3.9.3.5 New certificates for the ship can be issued by the gaining organization only after all overdue surveys have been satisfactorily completed and all overdue recommendations or overdue conditions of class previously issued in respect of the ship have been completed as specified by the losing organization.

3.9.3.6 Within one month from the issuance of the certificates, the gaining organization shall advise the losing organization of the date of issue of the certificates and confirm the date, place and action taken to satisfy each overdue survey, overdue recommendation and overdue condition of class.

3.9.3.7 ROs shall establish and implement appropriate common requirements concerning cases of transfer of the certification of a ship where special precautions are necessary. Those cases shall, as a minimum, include the certification of ships of 15 years of age or over and the transfer of a ship from an organization not recognized by the flag State of the ship.

3.10 Management review

3.10.1 *General*

The management of an RO shall review its quality management system; including a review of the RO's performance of statutory certification and services, at planned intervals, which shall not exceed 13 months, to ensure its continuing suitability, adequacy, and effectiveness. This review shall include assessing opportunities for improvement and the need for changes to the quality management system, including the quality policy and quality objectives.

3.10.2 *Review input*

The input to management review shall include the following information:

.1 results of audits;

.2 feedback from interested parties;

.3 process performance and consistency of compliance with statutory requirements;

[1] MSC-MEPC.5/Circ.2 – *Guidelines for Administrations to ensure the adequacy of transfer of class-related matters between recognized organizations (ROs)*.

.4 status of preventive and corrective actions;

.5 follow-up actions from previous management reviews;

.6 changes that could affect the quality management system; and

.7 recommendations for improvement.

Any output of management reviews containing information relevant to quality objectives, customer complaints and activity monitoring, throughout the RO, shall be used as input to the top management review.

3.10.3 ***Review output***

3.10.3.1 The output from management review shall include any decisions and actions related to:

.1 improvement of the effectiveness of the quality management system and its processes;

.2 improvement of services related to the requirements established in the authorization agreement; and

.3 resource requirements.

3.10.3.2 Top management shall ensure that the results of the top management review of the quality management system, including the derived quality objectives, are documented and communicated throughout the organization, as appropriate.

3.10.3.3 Records from management reviews shall be maintained.

4 RESOURCES

4.1 General

4.1.1 The RO shall determine and provide the adequate resources in terms of technical, managerial and survey capabilities to accomplish the tasks being assigned and resources needed to implement the quality management system and to continually improve its effectiveness; and to enhance its performance in the delivery of statutory certification and services.

4.1.2 The RO shall be able to document extensive experience in assessing the design, construction and equipment of ships and the capability to effectively perform statutory certification and services on behalf of a flag State.

4.1.3 The RO shall have the capacity to:

.1 provide for the publication and systematic maintenance of rules and/or regulations for the design, construction and certification of ships and their associated essential engineering systems as well as the provision of an adequate research capability to ensure appropriate updating of the published criteria. The RO is required to maintain an up-to-date version of this publication in the English language; and

.2 allow participation in the development of its rules and/or regulations by representatives of the flag State and other interested parties.

4.2 Personnel

4.2.1 The RO shall be equipped, at all times, with significant managerial, technical, support and research staff commensurate with the size of the fleet in its class, its composition and the organization's involvement in the construction, repair and conversion of ships. The RO shall be capable of assigning to every place of work, when and as needed, the means and staff commensurate with the tasks to be carried out in accordance with the requirements of this Code and those of the flag State.

4.2.2 The management of an RO shall have the competence, capability and capacity to organize, manage and control the performance of statutory certification and services in order to verify compliance with requirements relevant to the tasks delegated and shall, inter alia:

.1 possess an adequate number of competent supervisory, technical appraisal and survey personnel;

.2 develop and maintain appropriate procedures and instructions;

.3 maintain up-to-date documentation on interpretation of the relevant instruments;

.4 give technical and administrative support to field staff; and

.5 review survey reports and plan approval letters for accuracy, compliance with requirements and to provide experience feedback for continual improvement.

4.2.3 The RO shall be established with a qualified staff to provide the required service representing an adequate geographical coverage and local representation as required.

4.2.4 The RO shall perform statutory certification and services by the use of only exclusive surveyors and auditors, being persons solely employed by the RO, duly qualified, trained and authorized to execute all duties and activities incumbent upon their employer, within their level of work responsibility. While still remaining responsible for the certification on behalf of the flag State, the RO may subcontract radio surveys to non-exclusive surveyors in accordance with section 5.9 of part 2 of this Code.

4.2.5 The RO's personnel performing and responsible for statutory certification and services shall have, as a minimum, the following formal education:

.1 qualifications from a tertiary institution within a relevant field of engineering or physical science (minimum two-year programme); or

.2 qualifications from a marine or nautical institution and relevant seagoing experience as a certificated ship officer, and

.3 proficiency in the English language commensurate with the scope of statutory certification and services.

4.2.6 Other personnel assisting in the performance of statutory work shall have education, training and supervision commensurate with the tasks they are authorized to perform.

4.2.7 The RO shall have a documented system to track the qualifications of personnel; including continuous updating of their knowledge as appropriate to the tasks they are authorized to undertake. This system shall comprise appropriate training courses, including, inter alia, international instruments and appropriate procedures related to the delivery of statutory certification and services, as well as practical tutored training; it shall provide documented evidence of satisfactory completion of the training. As a minimum, the provisions in appendices 1 and 2 shall be met.

4.3 Infrastructure

4.3.1 The RO shall determine, provide, and maintain the infrastructure required to perform statutory certification and services in accordance with the requirements of the mandatory IMO instruments. Infrastructure includes, as applicable:

.1 building, workspaces and associated utilities;

.2 process equipment (both hardware and software); and

.3 supporting services, including but not limited to transport, communication, training and information systems.

4.3.2 Systems (hardware and software) provided to the surveyor shall be identified and relevant training on their use shall be carried out and documented. Special consideration should be given to the situation where a surveyor is working out of a home-based office.

4.4 Work environment

4.4.1 The RO shall be satisfied that the work environment is safe and effective to perform statutory certification and services. While it is understood that such environmental conditions are not provided by the RO, the environmental conditions under which the survey will be permitted to take place shall be made clear to the customer prior to survey commencing.

4.4.2 The RO shall determine the necessary working procedures required to perform statutory certification and services safely and effectively. Training of staff on personal safety shall be carried out and documented.

4.4.3 Requirements for personal protective equipment to be used while performing statutory certification and services and procedures for personal safety of surveyors at work shall be established and documented.

5 STATUTORY CERTIFICATION AND SERVICES PROCESSES

5.1 General

It should be recognized that statutory certification and services are service delivery development processes for flag State and RO compliance verification activities rather than the design process for a ship or its equipment.

5.2 Design and development

5.2.1 The RO shall plan and control the design and development of statutory certification and services processes. During the design and development planning, the organization shall determine:

.1 the design and development stages;

.2 the review, verification and validation that are appropriate to each service design and development stage; and

.3 the responsibilities and authorities for design and development.

5.2.2 The RO shall allow participation in the development and review of its rules, procedures and/or regulations, specifically in the review process prior to finalization, by representatives of the flag State and interested parties.

5.2.3 The RO shall include in its rules and/or procedures:

.1 requirements specified and communicated to ROs by the flag State, specifically for statutory certification and services[2];

.2 requirements not stated by the flag State but necessary for specified or intended use, as determined by the RO.

5.2.4 Implementation of requirements may be in the form of adoption into the RO's internal requirements or by use of the original documents from IMO or the flag State.

5.2.5 The RO shall not issue statutory certificates to a ship, irrespective of its flag, which has been declassed or is changing class for safety reasons, before giving the opportunity to the competent Administration of the flag State to give its opinion within a reasonable time as to whether a full inspection is necessary.

5.3 Design and development inputs

5.3.1 Inputs relating to service requirements shall be determined and records maintained.

These inputs shall include:

.1 applicable statutory and regulatory requirements;

.2 where applicable, information derived from previous similar designs;

.3 other requirements essential for design and development, such as functional and performance requirements; and

.4 in-service experience with ships and mobile offshore drilling units obtained from within the RO itself and external sources.

[2] Refer to the *Code for the implementation of mandatory IMO instruments, 2011*, adopted by resolution A.1054(27), as may be amended.

5.3.2 The inputs shall be reviewed for adequacy. Requirements shall be complete, unambiguous and not in conflict with each other.

5.4 Design and development outputs

At suitable stages, systematic reviews of design and development of rules and standards shall be performed in accordance with planned arrangements to evaluate the ability of the results to meet requirements; and to identify any problems and propose necessary actions.

5.5 Design and development verification

Verification shall be performed in accordance with planned arrangements to ensure that the design and development outputs have met the design and development input requirements. Records of the results of the verification and any necessary actions shall be maintained.

5.6 Control of design and development changes

Design and development changes shall be identified and records maintained. The changes shall be reviewed, verified and validated, as appropriate, and approved before implementation. The review of the design and development changes shall include evaluation of the effect of the changes on the constituent parts and product already delivered. Records of the results of the review of changes and any necessary actions shall be maintained.

5.7 Control of production and service provisions

5.7.1 The RO shall ensure that all statutory certification and services are carried out under controlled conditions.

5.7.2 Controlled conditions shall include, as applicable:

.1 the availability of information that describes the status and condition of ships surveyed and certified;

.2 the availability of rules, regulations, work instructions, and other applicable standards, as necessary;

.3 the use of suitable equipment;

.4 the availability and use of monitoring and measuring equipment;

.5 the implementation of monitoring and measurement;

.6 the implementation of controls to ensure the accuracy of survey reports and certificates both before and after issuance; and

.7 a safe work environment.

5.7.3 An RO shall conduct the statutory certification and services of the ship in conformity with all relevant international requirements and the requirements of this Code. When accepting a ship on behalf of the flag State that was constructed originally without a known flag State the RO shall verify that the ship complies with national requirements of that flag State prior to certification.

5.8 Property of clients

The RO shall identify, verify, protect and safeguard property provided by the clients for performance of statutory certification and services. If property is lost, damaged or otherwise found to be unsuitable for use, the RO shall report this to the property owner and maintain relevant records.

5.9 Subcontracting and service suppliers

5.9.1 Where an RO chooses to outsource any service that affects conformity to requirements or accepts work of a third party approved by the RO, the RO shall ensure that it fully controls the performance of such services. The flag State may increase the scope of control to be applied to these outsourced services. The process for outsourcing shall be defined within the RO's quality management system. For the purpose of accountability to the flag State, the work performed by the sub-contracted organization or service supplier constitutes the work of the RO and shall be subject to the requirements incumbent upon the RO under this Code.

5.9.2 Firms providing services on behalf of the owner of a ship or a mobile offshore drilling unit, the results of which are used by the RO in making decisions affecting the statutory certification and services shall be subject to approval and control by either the flag State or the RO in accordance with the procedures under their respective quality management system or the flag State requirements.

5.10 Control of monitoring and measuring devices

5.10.1 The RO shall determine the monitoring and measurement to be undertaken and the monitoring and measurement equipment needed to provide evidence of conformity to the applicable requirements.

5.10.2 The RO shall establish processes to ensure that monitoring and measurement can be carried out in a manner that is consistent with the monitoring and measurement requirements.

5.10.3 Where necessary to ensure valid results, measuring equipment shall:

.1 be calibrated or verified, or both, at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exist, the basis used for calibration or verification shall be recorded;

.2 be adjusted or re-adjusted as necessary;

.3 have identification in order to determine its calibration status;

.4 be safeguarded from adjustments that would invalidate the measurement result; and

.5 be protected from damage and deterioration during handling, maintenance, and storage.

5.10.4 The RO shall assess and record the validity of previous measuring results when the equipment is found not to conform to requirements. The RO shall take appropriate action on the equipment affected. Records of results of calibration and verification shall be maintained.

5.10.5 When used in monitoring and measurement of specific requirements, the ability of computer software to satisfy the intended application shall be confirmed. This shall be undertaken prior to initial use and reconfirmed as necessary.

5.10.6 Where an RO is verifying testing at manufacturers, builders, repairers or owners premises and reporting the same, the RO shall ensure that the measuring devices used in the process are identified and that evidence of calibration is obtained. Where an RO is witnessing testing of service equipment installed or available on board a ship, a means shall be established so that the RO is satisfied as to the appropriate accuracy of the measuring equipment.

5.11 Complaints

The RO shall have a documented process to address complaints related to statutory certification and services.

5.12 Appeals

The RO shall have a documented process to address appeals related to statutory certification and services in accordance with the requirements of the flag State.

6 PERFORMANCE MEASUREMENT, ANALYSIS AND IMPROVEMENT

6.1 General

6.1.1 The RO shall plan and implement the monitoring, measurement, analysis and improvement processes needed to demonstrate conformity to statutory certification and services requirements, to ensure conformity of the quality management system, and to continually improve the effectiveness of the quality management system. This shall include the determination of applicable methods, including statistical techniques, and the extent of their use. The measurements employed by the RO shall be reviewed periodically, and data shall be verified on a continual basis for accuracy and completeness.

6.1.2 The RO shall develop key performance indicators with respect to the performance of statutory certification and services.

6.2 Internal audit

6.2.1 The RO shall implement an audit programme; including the completion of internal audits at planned intervals to determine whether the authorized activity conforms to the planned arrangements and that the quality management system is effectively implemented and maintained, and that a supervisory system is in place, which monitors statutory certification and services.

6.2.2 The audit programme shall take into consideration the status and importance of the processes and areas to be audited, as well as the results of previous audits, flag State feedback, complaints and appeals including port State and flag State inspections. When planning the internal audits, consideration shall be given to complaints received in the past (either related to the location or in general) and to the results of previous internal audits and to the operation of the locations.

6.2.3 The RO shall define the audit criteria, scope, frequency, and methods. Auditors shall be suitably qualified and selected in order to ensure objectivity and impartiality of the audit process. Auditors shall not audit their own work. The audit scope shall cover the processes for the statutory certification and services at various locations with a focus on verification of the efficient and effective implementation of the quality management system and applicable work processes at the individual location. The audit periods, which may be established according to the findings, shall ensure that each location is audited at least once per three years. Audits at locations shall also include visits to selected sites, which operate under the control of the location.

6.2.4 A documented procedure shall be established to define the responsibilities and requirements for planning and conducting audits, establishing records and reporting results. Records of audits and their results shall be maintained.

6.2.5 The management responsible for the area being audited shall ensure that any necessary corrections and corrective actions are taken without undue delay to eliminate detected nonconformities, observations (potential non-conformities) and their root causes.

6.3 Vertical Contract Audit

6.3.1 The RO shall carry out Vertical Contract Audits annually for each of the following processes:

.1 plan approval;

.2 new construction survey;

.3 in-service periodical survey/audit; and

.4 type approval (where applicable) or survey of other materials and equipment.

6.3.2 Evidence of completion of VCAs and findings thereof, shall be formally recorded.

6.4 Monitoring and measurement of processes

6.4.1 The RO shall apply suitable methods for monitoring, including a supervisory system that monitors the work activities carried out, and where applicable, measurement of the quality management system processes. These methods shall demonstrate the ability of the processes to achieve sustained compliance with the requirements of this Code and the agreement with the flag State, in particular that:

.1 the RO's rules and/or regulations are complied with; and

.2 the requirements of the statutory certification and services are satisfied.

6.4.2 When planned results are not achieved, correction and corrective action shall be taken, as appropriate.

6.4.3 The implemented methods should consider issues such as, but not limited to:

.1 port State control detentions;

.2 casualties; and

.3 rework of plan approval letters and survey reports.

6.5 Control, monitoring and measurement of non-conformities, including statutory deficiencies

6.5.1 The RO shall monitor and measure the service delivery with statutory requirements and the RO's rules to verify that all requirements have been met. This shall be carried out at appropriate stages of the statutory certification and services process in accordance with the planned arrangements. Evidence of conformity with the statutory requirements and RO rules shall be maintained. Records shall indicate the person(s) approving or verifying compliance with the statutory requirements and the RO's rules.

6.5.2 The RO shall make provisions to ensure that non-conformities are identified and controlled. The controls and related responsibilities and authorities for dealing with non-conformities shall be defined in a documented procedure.

6.5.3 Where applicable, the RO shall deal with a non-conformity by one or more of the following ways:

.1 by taking action to eliminate the detected non-conformity;

.2 by authorizing its use, release or acceptance under the terms determined by the flag State;

.3 when accepting with or without correction by exemption or equivalence, consideration should be given to the non-conformities with rules and regulations or statutory requirements during:

.1 drawing approval,

.2 survey of materials and equipment,

.3 survey during construction and installation,

.4 survey during service;

.4 by taking action to preclude its original intended use or application; and

.5 by taking action appropriate to the effects, or potential effects, of the non-conformity when a non-conformity is detected.

6.5.4 When a non-conformity is corrected, it shall be subject to reverification to demonstrate conformity to the requirements.

6.5.5 Records of the nature of non-conformities and any subsequent actions taken, including exemption or equivalences obtained, shall be maintained.

6.5.6 The RO shall comply with the instructions of the flag State detailing actions to be followed in the event that a ship is found not fit to proceed to sea without danger to the ship or persons on board, or presenting unreasonable threat of harm to the marine environment.

6.5.7 The ROs shall cooperate with port State control Administrations where a ship to which the RO issued the certificates is concerned, in particular, in order to facilitate the rectification of reported deficiencies or other discrepancies.

6.5.8 The RO responsible for issuing the relevant certificate shall, upon receiving a report of an accident or discovering a defect to a ship which affects the safety of the ship or the efficiency or completeness of its life saving appliances or other equipment, cause investigations to be initiated to determine whether a survey is necessary.

6.6 Improvement

6.6.1 *General*

The RO shall continually improve the effectiveness of its quality management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.

6.6.2 *Data analysis*

6.6.2.1 The objective of data analysis is to determine the cause of problems to guide effective corrective and preventive action. The RO shall:

.1 analyse data from various sources to assess performance against plans and goals and to identify areas for improvement;

.2 make use of statistical methodologies for data analysis, which can help in assessing, controlling, and improving performance of processes; and

.3 analyse the product requirements, as well as analysis of relevant processes, operations and quality records.

6.6.2.2 Information and data from all parts of the RO shall be integrated and analysed to evaluate the overall performance of the quality management system.

6.6.2.3 The results of analysis shall be documented and used to determine:

.1 trends;

.2 operational performance;

.3 customer satisfaction and/or dissatisfaction through complaints or other quality indicators (PSC detentions, flag State non-conformities, etc.);

.4 effectiveness and/or efficiency of processes; and

.5 performance of suppliers.

6.6.3 *Sources of information*

The RO shall identify sources of information and establish processes for collection of information for planning continual improvement, corrective and preventive actions. Such information shall include, inter alia:

.1 customer complaints;

.2 non-conformance reports;

.3 outputs from management reviews;

.4 internal audit reports;

.5 outputs from data analysis;

.6 relevant records;

.7 outputs from customer feedback and satisfaction measurements;

.8 process measurements;

.9 results of self-assessment; and

.10 in-service experience.

6.6.4 *Corrective action*

6.6.4.1 The RO shall without undue delay take action to eliminate the causes of non-conformities in order to prevent recurrence. Corrective actions shall be appropriate to the effects of the non-conformities encountered and address all actual or potential effects of these.

6.6.4.2 A documented procedure shall be established to define requirements for:

.1 reviewing non-conformities (including complaints);

.2 determining the cause of non-conformities;

.3 evaluating the need for action to ensure that non-conformities do not recur;

.4 determining and implementing action needed;

.5 records of the results of action taken; and

.6 reviewing the effectiveness of the corrective action taken.

6.6.5 *Preventive action*

6.6.5.1 The RO shall take action to identify and eliminate the causes of potential non-conformities in order to prevent their occurrence. Preventive actions shall be appropriate to the nature and effects of the potential problems.

6.6.5.2 A documented procedure shall be established to define requirements for:

.1 determining potential non-conformities and their causes;

.2 evaluating the need for action to prevent occurrence of non-conformities;

.3 determining and implementing action needed;

.4 records of results of action taken; and

.5 reviewing the effectiveness of the preventive action taken.

6.6.5.3 Examples of such methodologies may include risk analyses, trend analyses, statistical process control, fault-tree analyses, failure modes and effects and criticality analyses.

7 QUALITY MANAGEMENT SYSTEM CERTIFICATION

7.1 The RO shall develop, implement and maintain an effective internal quality management system that complies with the requirements of this Code and is based on appropriate parts of internationally recognized quality standards no less effective than the ISO 9000 series.

7.2 The RO's quality management system shall be periodically assessed and certified in accordance with the applicable international quality standards by a qualified body, accredited to comply with ISO/IEC 17021:2006 standard by an accreditation body that is signatory to the International Accreditation Forum (IAF) Multinational Recognition Agreement (MRA), recognized by the flag State as having the necessary governance and competences to act independently of the ROs or their associations and having the necessary means to carry out its duties effectively and to the highest professional standards, safeguarding the independence of the persons performing them.

7.3 In pursuance of continually improving RO and flag State services, IMO endeavours to closely monitor the certification and audit process of the RO and its implementation to ensure its continued relevance and validity to the maritime industry in general and to the ROs, in particular. IMO will establish the working methods and rules of procedure for such monitoring.

8 AUTHORIZATION OF RECOGNIZED ORGANIZATIONS

8.1 General

Under the provisions of regulation I/6 of SOLAS 1974, article 13 of LL 66, regulation 6 of MARPOL Annex I and regulation 8 of MARPOL Annex II and article 6 of TONNAGE 69, a flag State may authorize an RO to act on its behalf in statutory certification and services and determination of tonnages only to ships entitled to fly its flag as required by these conventions. Such authorizations shall not require ROs to perform actions that impinge on the rights of another flag State.

8.2 Legal basis of the functions under authorization

The flag State shall establish the legal basis under which the authorization of statutory certification and services is administered. The following items shall be considered:

.1 the formal written agreement with the RO;

.2 acts, regulations and supplementary information;

.3 interpretations; and

.4 deviations and equivalent solutions.

8.3 Specification of authorization

The flag State shall specify the scope of authorization granted to an RO. The following specifications shall be considered:

.1 ship types and sizes;

.2 conventions and other instruments, including relevant national legislation;

.3 approval of drawings;

.4 approval of materials and equipment;

.5 surveys, audits, inspections;

.6 issuance, endorsement and/or renewal of certificates;

.7 corrective actions;

.8 withdrawal or cancellation of certificates; and

.9 reporting requirements.

8.4 Resources

The flag State shall ensure that an RO has adequate resources in terms of technical, managerial and research capabilities to accomplish the tasks being assigned, in accordance with the minimum standards for ROs acting on behalf of the flag State set out in part 2 of this Code.

8.5 Instruments

The flag State shall provide the RO with access to all appropriate instruments of national law giving effect to the provisions of the conventions, notify the RO of any additions, deletions or revisions thereto in advance of their effective date and specify whether the flag State's standards go beyond convention requirements in any respect.

8.6 Instructions

8.6.1 The flag State shall issue specific instructions detailing the procedures to be followed in carrying out statutory certification and services, and actions to be followed in the event that a ship is found not fit to proceed to sea without danger to the ship or persons on board, or presenting unreasonable threat of harm to the marine environment.

8.6.2 Flag States shall ensure by appropriate means that ROs cooperate with each other in accordance with the provisions of this Code.

8.7 Records

The flag State shall specify that the RO maintain records, which can provide the flag State with data to assist in interpretation of convention regulations.

PART 3

OVERSIGHT OF RECOGNIZED ORGANIZATIONS

1 PURPOSE

Part 3 of the RO Code provides guidance on flag State's oversight of ROs authorized to perform statutory certification and services on its behalf. Part 3 also provides guidance on the principles of oversight that may include ship inspection, auditing, and monitoring activities.

2 SCOPE

Part 3 of the RO code is applicable to all flag States that have authorized ROs to perform statutory certification and services. Part 3 includes flag State oversight provisions and provides guidance, which is non-mandatory, to assist flag States in the development and implementation of an effective oversight programme of ROs.

3 REFERENCES

The following documents are referenced:

.1 mandatory IMO instruments;

.2 ISO 9000:2005, Quality Management Systems – Fundamentals and vocabulary;

.3 ISO 9001:2008, Quality Management Systems – Requirements;

.4 ISO/IEC 17020:1998, General Criteria for the operation of various types of bodies performing inspection;

.5 ISO 19011:2002, Guidelines for quality and/or environmental management systems auditing; and

.6 national legislation.

4 TERMS AND DEFINITIONS

4.1 *Audit* means a systematic, independent, and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled. Auditing is characterized by reliance on a number of principles. These make the audit an effective and reliable tool in support of management policies and controls, providing information on which an RO can act to improve its performance. Adherence to these principles is a prerequisite for providing audit conclusions that are relevant and sufficient and for enabling auditors working independently from one another to reach similar conclusions in similar circumstances.

4.2 *Audit criteria* means a set of policies, procedures or requirements.

4.3 *Audit evidence* means records, statements of fact, or other information, which are relevant to the audit criteria and verifiable. Audit evidence may be qualitative or quantitative.

4.4 *Audit findings* means results of the evaluation of the collected audit evidence against audit criteria. Audit findings can indicate conformity, observation (potential non-conformity) or non-conformity with audit criteria or opportunities for improvement.

4.5 *Audit conclusion* means an outcome of an audit, provided by the audit team, after consideration of the audit objectives and all audit findings.

4.6 *Audit client* means an organization or person requesting an audit.

4.7 *Auditee* is an organization recognized by a flag State that may be subject to an audit by the authorizing flag State.

4.8 *Auditor* means a person with the competence to conduct an audit.

4.9 *Audit team* means one or more auditors conducting an audit, supported if required by technical experts.

4.10 *Technical expert* means a person who provides specific knowledge or expertise to the audit team.

4.11 *Audit programme* means a set of one or more audits planned for a specific period and directed towards a specific purpose. An audit programme includes all activities necessary for planning, organizing, and conducting the audits.

4.12 *Audit plan* means a description of the activities and arrangements for an audit.

4.13 *Audit scope* means extent and boundaries of an audit. The audit scope generally includes a description of the physical locations, organizational units, activities and processes, as well as the time period covered.

4.14 *Competence* means demonstrated personal attributes and demonstrated ability to apply knowledge and skills.

4.15 *Oversight* means any activity by a flag State carried out to assure an RO's service complies with IMO and national requirements of the recognizing flag State.

4.16 *Monitoring* means any activity by a flag State where a flag State witnesses services by an RO or reviews documentation used by the RO and which is carried out to assure that RO services are in compliance with IMO and national requirements. Monitoring may be considered as a component of oversight.

5 ESTABLISHING AN OVERSIGHT PROGRAMME

5.1 Oversight

The flag State should establish or participate in an oversight programme with adequate resources for monitoring of, and communication with, its RO(s) in order to ensure that its international obligations are fully met, by:

.1 exercising its authority to conduct supplementary surveys to ensure that ships entitled to fly its flag in fact comply with the requirements of the applicable international instruments;

.2 conducting supplementary surveys as it deems necessary to ensure that ships entitled to fly its flag comply with national requirements, which supplement the international mandatory requirements; and

.3 providing staff who have a good knowledge of the rules and regulations of the flag State and the ROs and who are available to carry out effective oversight of the ROs.

5.2 Flag State's supervision of duties delegated to an RO

The flag State's supervision of duties delegated to an RO should consider, inter alia, the following:

.1 documentation of the RO's quality management system;

.2 access to internal instructions, circulars and guidelines;

.3 access to the RO's documentation relevant to the flag State's fleet;

.4 cooperation with the flag State's inspection and verification work; and

.5 provision of information and statistics; such as, but not limited to, damage and casualties relevant to the flag State's fleet.

5.3 Verification and monitoring

The flag State should establish a system to ensure the adequacy of statutory certification and services provided. Such a system should, inter alia, include the following items:

.1 procedures for communication with the RO;

.2 procedures for reporting to the flag State by the RO and the processing of such reports by the flag State. The following reporting requirements should be considered:

.1 the RO should notify the flag State immediately upon becoming aware of a situation involving a major deficiency, or serious safety-related issue, that would normally be considered sufficient to detain a ship from proceeding to sea pending correction;

.2 the RO should notify the flag State(s) immediately upon becoming aware of a situation aboard ship or within a company involving a major non-conformity, as defined in the *Guidelines on the Implementation of the International Safety Management (ISM) Code by Administrations* (resolution A.1022(26), as amended);

.3 the notification above should contain the name of the company or ship, the IMO number, the official number, if applicable, and a description of the major non-conformity, deficiency or issue;

.4 the RO should inform the flag State, as soon as possible, of any dangerous occurrences, accidents, machinery or structural breakdowns, or failures that they are aware of on a ship; and

.5 the RO should report to the flag State in writing the names and official numbers, if applicable, of any ships removed from the RO's list of classed/certified ships for which the RO has performed statutory certification and services. The report should contain a description of the reason(s) for removal from class, and this should be made within thirty (30) days of the removal becoming effective;

.3 additional ship's inspections by the flag State;

.4 appropriate technical and/or safety related consultations between ROs regarding statutory certification and services, which may affect the validity of certificates issued either in whole or in part on behalf of the flag State(s);

.5 the flag State's evaluation/acceptance of the certification of the RO's quality management system by an independent body of auditors accepted by the flag State;

.6 monitoring and verification of statutory certification and services, which contribute either in whole or in part to compliance with a mandatory IMO instrument. The flag State should consider the implementation of the following:

.1 flag State's oversight of RO quality management systems;

.2 observation of or systematic review of reports of the quality management system audits conducted by other qualified persons or organizations external to and independent of the RO;

.3 verification and inspection of ships that are subject to statutory certification and services; and

.4 complaint and feedback system and corrective action follow-up;

.7 a flag State accepting ships constructed without its involvement should establish that an RO conducting statutory certification and services of the ship conforms to this Code; and

.8 for ships constructed without an identified flag State, the flag State specific requirements should be verified prior to certification.

6 PRINCIPLES OF AUDITING

6.1 The flag State should be satisfied that the RO has an effective quality management system in place. The flag State may rely upon the audits carried out by an accredited certification body or equivalent organizations. Intergovernmental cooperation in establishing common auditing practices is encouraged.

6.2 A flag State auditor should advance the following principles:

.1 ethical conduct: the foundation of professionalism. Trust, integrity, confidentiality and discretion are essential to auditing;

.2 fair presentation: the obligation to report truthfully and accurately. Audit findings, audit conclusions, and audit reports reflect truthfully and accurately the audit activities. Significant obstacles encountered during the

audit and unresolved diverging opinions between the audit team and the auditee are reported; and

.3 due professional care: the application of diligence and judgment in auditing. Auditors exercise care in accordance with the importance of the task they perform and the confidence placed in them by audit clients and other interested parties. Having the necessary competence is an important factor.

6.3 Further principles relate to the audit, which is by definition independent and systematic.

.1 independence: the basis for the impartiality of the audit and objectivity of the audit conclusions. Auditors are independent of the activity being audited and are free from bias and conflict of interest. Auditors maintain an objective state of mind throughout the audit process to ensure that the audit findings and conclusions will be based only on the audit evidence;

.2 evidence-based approach: the rational method for reaching reliable and reproducible audit conclusions in a systematic audit process. Audit evidence is verifiable. It is based on samples of the information available, since an audit is conducted during a finite period of time and with finite resources. The appropriate use of sampling is closely related to the confidence that can be placed in the audit conclusions.

6.4 The guidance given in this Code is based on the principles set out above.

7 MANAGING AN OVERSIGHT PROGRAMME

7.1 General

7.1.1 The flag States are required to verify that the organizations recognized to perform statutory certification and services on their behalf fulfil the requirements of this Code. The purpose of this verification is to ensure that the RO is performing its statutory certification and service in compliance with this Code and its agreement with the flag State.

7.1.2 The flag State should develop, implement, and manage an effective oversight programme of the ROs that act on its behalf.

7.1.3 An oversight programme should include various monitoring activities, which may inter alia consist of audits, inspections and audit observations (potential non-conformities). The flag States' oversight programme of their ROs should be developed after carefully assessing the factors associated with the RO as well as the extent of access to the RO's records of statutory certification and services that are made available to the flag State. The programme should also consider the delivery of statutory certification and services with respect to the provisions of the Conventions and with respect to the national requirements and instructions published by the flag State. Factors should include:

.1 the scope and frequency of high level audits of the RO carried out by flag States and independent accredited bodies, and of internal audits carried out by the RO;

.2 the extent to which audit findings, observations (potential non-conformities) and corrective actions are made available to the flag State;

.3 the extent to which remote monitoring of the RO can be undertaken by the flag State which can manifest itself in several different ways depending on the scope of information that is electronically available to the flag State. Remote monitoring can include:

.1 review of the contents of survey reports associated with statutory certificates issued by the RO;

.2 review of the effectiveness of the control and rectification of deficiencies and outstanding requirements within the deadlines established by the flag State through the RO; and

.3 review of the RO's country-specific instructions to determine that the flag State's national requirements are properly and completely addressed by the RO;

.4 flag State inspections carried out on board ships to check the end-result of the certification process, with a specific interest in their national requirements and/or implementation of instructions issued to the RO; and

.5 port State control detentions and deficiencies allocated to the responsibility of the RO.

7.1.4 An oversight programme should also include all activities necessary for planning and organizing the types and number of monitoring activities, and for providing resources to conduct them effectively and efficiently within the specified periods.

7.1.5 Those assigned the responsibility for managing the oversight programme should:

.1 establish, implement, monitor, review and improve the oversight programme; and

.2 identify the necessary resources and ensure they are available and provided, as required.

7.1.6 An oversight programme should also include planning, the provision of resources and the establishment of procedures to conduct monitoring activities within the programme.

7.2 Oversight programme objectives and extent

7.2.1 *Objectives of an oversight programme*

7.2.1.1 The flag State should establish objectives for an oversight programme, to direct the planning and conduct of monitoring activities.

7.2.1.2 The following objectives should be considered:

.1 management priorities;

.2 flag State intentions;

.3 flag State system requirements;

.4 statutory, regulatory and contractual requirements;

.5 need for ROs to be evaluated;

.6 flag State, ROs, and other requirements;

.7 needs of other interested parties; and

.8 risks to the flag State.

7.2.2 *Extent of an oversight programme*

7.2.2.1 The flag State's oversight programme should reflect the size, nature and complexity of the flag State's authorization programme, as well as the following factors:

.1 the scope, objective and duration of monitoring activities to be conducted;

.2 the frequency of monitoring activities to be conducted;

.3 the number, importance, complexity, similarity, and locations of the ROs;

.4 standards, statutory, regulatory, and contractual requirements and other monitoring criteria;

.5 the need for accreditation or registration/certification of ROs;

.6 conclusions of previous monitoring activities;

.7 the concerns of interested parties; and

.8 significant changes to an RO or its operations.

7.2.2.2 A flag State may enter into a written agreement to participate in combined monitoring/oversight activities with another flag State or States that have authorizations with the same RO provided that the level of detail regarding individual flag State requirements and individual flag State performance are addressed at a level equivalent to an oversight programme conducted by each of the individual flag State. Conversely no flag State may be compelled by another flag State or organization to accept oversight of an RO by others in lieu of conducting its own individual flag State oversight unless it so elects by written agreement or is so provided in the law of that State. A copy of all such agreements should be submitted to IMO for the information of the Member States.

7.3 Oversight programme responsibilities, resources and procedures

7.3.1 *Oversight programme responsibilities*

7.3.1.1 The flag State is responsible for managing its oversight programme. The flag State should utilize competent individuals that have an understanding of the oversight requirements, audit principles, and the application of audit techniques. They should have management skills as well as technical and business understanding relevant to the activities to be monitored.

7.3.1.2 Those assigned the responsibility for managing the oversight programme should:

.1 establish the objectives and extent of the oversight programme;

.2 establish the responsibilities and procedures, and ensure resources are provided;

.3 ensure the implementation of the oversight programme;

.4 ensure that appropriate oversight programme records are maintained; and

.5 monitor, review and improve the oversight programme.

7.3.2 *Oversight programme resources*

When identifying resources for the oversight programme, the flag State should consider the following:

.1 financial resources necessary to develop, implement, manage, and improve oversight activities;

.2 auditing techniques;

.3 processes to achieve and maintain the competence of staff, and to improve oversight performance;

.4 the availability of staff and technical experts having competence appropriate to the particular oversight programme objectives;

.5 the extent of the oversight programme; and

.6 travelling time, accommodation and other oversight needs.

7.3.3 *Oversight programme procedures*

7.3.3.1 The flag State's oversight programme procedures should address the following:

.1 planning and scheduling of oversight activities;

.2 assuring the competence of assigned personnel;

.3 selecting appropriate personnel and assigning their roles and responsibilities;

.4 conducting monitoring activities;

.5 conducting follow-up, if applicable;

.6 maintaining oversight programme records;

.7 monitoring the performance and effectiveness of the oversight programme; and

.8 reporting on the overall achievements of the oversight programme.

7.3.3.2 For flag States with a limited authorization programme, the activities above may be addressed in a single procedure.

7.3.4 *Oversight programme implementation*

The implementation of a flag State oversight programme should include the following factors:

.1 communicating the objectives of the oversight programme to relevant parties;

.2 coordinating and scheduling monitoring activities relevant to the oversight programme;

.3 establishing and maintaining a process for the evaluation of assigned personnel and their continual professional development;

.4 selecting and appointing assigned personnel;

.5 providing necessary resources to the oversight programme, specifically the corresponding monitoring activities;

.6 robust execution of monitoring activities according to the oversight programme;

.7 ensuring the control of records of the monitoring activities;

.8 ensuring review and approval of monitoring activity reports, and ensuring their distribution to interested parties; and

.9 ensuring follow-up, if applicable.

7.3.5 *Oversight programme records*

7.3.5.1 The flag State's monitoring records should be maintained to demonstrate the implementation of the oversight programme and should include the following:

.1 all records related to monitoring activities, such as:

.1 plans;

.2 reports;

.3 non-conformity reports;

.4 corrective and preventive action reports, and

.5 follow-up reports, if applicable;

.2 results of oversight programme review; and

.3 records related to personnel covering subjects, such as:

.1 assigned personnel competence and performance evaluation;

.2 monitoring and/or audit team selection; and

.3 maintenance and improvement of competence.

7.3.5.2 Records should be retained and suitably safeguarded.

7.4 Oversight programme monitoring and reviewing

7.4.1 The implementation of a flag State oversight programme should be monitored and, at appropriate intervals, reviewed to assess whether its objectives have been met and to identify opportunities for improvement.

7.4.2 The flag State should develop and use performance indicators to monitor the effectiveness of its oversight programme for ROs. The following factors should be considered:

.1 the ability of assigned personnel to implement the oversight plan;

.2 conformity with the requirements of the RO Code, monitoring activities, and schedules; and

.3 feedback from clients, ROs and assigned personnel.

7.4.3 The flag State should consider the following performance indicators when evaluating the performance of the ROs:

.1 port State performance of ROs;

.2 results of RO's internal audits;

.3 results of quality management system audits performed by third-party organizations (ACBs);

.4 the results of previous performance monitoring; and

.5 condition/compliance of ships that receive survey and certification from the ROs.

7.4.4 The flag State should, on a periodic basis, evaluate its overall performance with respect to the implementation of administrative processes, procedures and resources necessary to meet its obligations as required by the conventions to which it is party.

7.4.5 Other measures to evaluate the performance of the flag States may include, inter alia, the following:

.1 port State control detention rates;

.2 flag State inspection results;

.3 casualty statistics;

.4 communication and information processes;

.5 annual loss statistics (excluding constructive total losses (CTLs)); and

.6 other performance indicators as may be appropriate, to determine whether staffing, resources and administrative procedures are adequate to meet their flag State obligations. Other performance measurement indicators may consist of the following:

.1 fleet loss and accident ratios to identify trends over selected time periods;

.2 the number of verified cases of detained ships in relation to the size of the fleet;

.3 the number of verified cases of incompetence or wrongdoing by individuals holding certificates or endorsements issued under its authority;

.4 responses to port State deficiency reports or interventions;

.5 investigations into very serious and serious casualties and lessons learned from them;

.6 technical and other resources committed;

.7 results of inspections, surveys and controls of the ships in the fleet;

.8 investigation of occupational accidents;

.9 the number of incidents and violations under MARPOL, as amended; and

.10 the number of suspensions or withdrawals of certificates, endorsements and approvals.

7.4.6 The oversight programme review should also consider:

.1 results and trends from monitoring;

.2 conformity with procedures;

.3 evolving needs and expectations of interested parties;

.4 oversight programme records;

.5 alternative or new auditing practices or monitoring activities; and

.6 consistency in performance between audit teams in similar situations.

7.4.7 Results of oversight programme reviews can lead to corrective and preventive actions and the improvement of the oversight programme.

* * *

Appendix 1

REQUIREMENTS FOR TRAINING AND QUALIFICATION OF RECOGNIZED ORGANIZATION'S TECHNICAL STAFF

A1.1 Definitions

A1.1.1 *Survey staff* are the personnel authorized to carry out surveys and to conclude whether or not compliance has been achieved.

A1.1.2 *Plan approval staff* are the personnel authorized to carry out design assessment and to conclude whether or not compliance has been achieved.

A.1.1.3 *Audit staff* are the personnel authorized to carry out audits and to conclude whether compliance has been achieved.

A1.1.4 *Trainee* is a person receiving theoretical and practical training under the supervision of a trainer/tutor.

A1.1.5 *Trainer* is a designated person having experience within a relevant area or a proficient expert in a special field recognized by the RO to give theoretical training through classroom teaching, special seminars or individual training.

A1.1.6 *Tutor* is a qualified and designated person from among the RO's staff having appropriate experience and capability in the relevant areas of activities in which they assist, consult and supervise the practical training of a trainee until the latter is qualified.

A1.1.7 *Technical staff* are the personnel qualified to carry out technical activity as survey staff or plan approval staff or, Marine Management Systems audit staff.

A1.1.8 *Support staff* are the personnel assisting survey and/or plan approval staff in connection with classification and statutory work.

A1.2 Trainee entry requirements

RO personnel performing, and responsible for, statutory work shall have as a minimum the formal education requirements defined in part 2, section 4.2.5.

A1.3 Modules

A1.3.1 The RO shall define the required competence criteria for each relevant type of survey, and type of plan approval activity and audit to be performed.

A1.3.2 The RO shall define the necessary theoretical and practical training modules required to meet the competence criteria defined for survey, plan approval and marine management systems audit staff. The training modules shall cover as a minimum:

.1 learning and competence objectives;

.2 scope of training; and

.3 evaluation criteria and pass requirements.

A1.3.3 Through studying the training modules, trainees shall acquire and develop general knowledge and understanding applicable to different types of ships and types of work according to the flag State requirements, RO's rules and regulations and international conventions and codes.

A1.4 Theoretical training for survey and plan approval staff

A1.4.1 The objective of theoretical training is to ensure that familiarization with rules, technical standards or statutory regulations and any additional requirement specific to the type of survey or ships is sufficient for the areas of activity.

A1.4.2 Theoretical training shall include:

.1 general modules for theoretical training; and

.2 special modules for theoretical training in the particular specialty.

A1.4.3 General modules for theoretical training shall include general subjects with respect to:

.1 activity and functions of IMO and maritime Administrations;

.2 activity and functions of classification societies;

.3 classification of ships and mobile offshore drilling units;

.4 types of certificates and reports issued on completion of class and statutory surveys;

.5 quality management system;

.6 personal safety regulations; and

.7 legal and ethical issues.

A1.4.4 The programmes of theoretical training for survey and plan approval staff shall be documented in a training plan and developed according to the areas of activity (types or categories of surveys, types of ships, subjects such as hull, machinery, electrical engineering, etc.).

A1.4.5 In case of an existing gap in the formal educational background in some particular field of activity, theoretical training shall be extended.

A1.4.6 In case survey or plan approval staff have obtained particular qualifications through their previous work experience prior to their joining the RO, the training plan may be reduced.

A1.4.7 Additions or reductions in the individual training plans shall be documented.

A1.4.8 In case of extension of areas of activity the training plan shall be developed and documented accordingly.

A1.4.9 Theoretical training may be received through classroom teaching, special seminars, individual training, self-study or computer-assisted training.

A1.5 Practical training for survey and plan approval staff (see appendix 2 for specific criteria for each certificate)

A1.5.1 General

Practical training shall ensure the trainee is sufficiently proficient to carry out survey or design assessment work independently.

A1.5.2 Plan approval staff

A1.5.2.1 Practical training shall be commensurate with the complexity of design assessment (review of technical design of ships, review of technical documentation on materials and equipment) and shall be carried out under the supervision of a tutor.

A1.5.2.2 Practical training carried out shall be recorded.

A1.5.3 Survey staff

A1.5.3.1 Practical training shall be commensurate with the complexity of the survey (types or categories of surveys, types of ships, specific subjects (hull, machinery, and electrical engineering)) and shall be carried out under the supervision of a tutor.

A1.5.3.2 Selection of particular surveys depends on the specialty/qualification to be granted and shall include classification and statutory types of surveys of the following, as appropriate:

.1 new construction;

.2 ships and mobile offshore drilling units in operation; and

.3 materials and equipment.

A1.5.3.3 Practical training carried out shall be recorded.

A1.5.4 Examinations and tests for survey and plan approval staff

A1.5.4.1 Competence gained through the theoretical training shall be demonstrated through written or oral examination or through suitable computer tests.

A1.5.4.2 Examinations and tests shall cover the sets of modules attended by the trainee, as applicable.

A1.5.4.3 With respect to competence gained through practical training being demonstrated by:

.1 a surveyor, this shall be accomplished by the surveyor satisfactorily completing the surveys associated with the competence whilst under the supervision of the tutor. The surveyor would be expected to be able to answer associated technical questions raised as thought necessary by the tutor to confirm levels of understanding. The results of the tutor's review shall be annotated on the respective training record; and

.2 a plan approval staff member, this shall be accomplished by the staff member satisfactorily completing the appraisal of drawings against the relevant classification rules and statutory regulations as verified through a review by the tutor of the staff member's work. The results of the tutor's review shall be annotated on the respective training record.

A1.5.4.4 A competent person shall perform examinations of theoretical training or witnessing practical competence.

A1.5.4.5 During examinations and tests, use of the relevant working documents (rules, conventions, checklists, etc.) by the trainee shall be considered allowable.

A1.5.5 Audit staff

A1.5.5.1 Theoretical training

A1.5.5.1.1 Theoretical training should address the following:

.1 principles and practice of management systems auditing;

.2 the requirements of the International Safety Management (ISM) Code and its interpretation and application;

.3 mandatory rules and regulations and applicable codes, guidelines and standards recommended by the IMO, flag States, classification societies and maritime industry organization; and

.4 basic shipboard operations including emergency preparedness and response. The time spent on each topic and the level of detail that it is necessary to include will depend on the qualifications and experience of the trainees, their existing competence in each subject, and the number of training audits to be carried out.

A1.5.5.1.2 The training may be modular in structure, in which case the period over which the theoretical training is delivered shall not exceed 12 months.

A1.5.5.1.3 Where appropriate, some elements may be delivered by means such as distance learning and e-learning. However, at least fifty per cent of the total theoretical training days shall be classroom-based in order to allow for discussion and debate and to allow candidates to benefit from the experience of the trainer.

A1.5.5.2 Examination

A1.5.5.2.1 Confirmation that the learning objectives have been met shall be demonstrated by written examination at the end of the theoretical training, or at the end of each module if the training is not delivered in a single training course.

A1.5.5.2.2 If the trainee fails the written examination, or any part thereof; a single resist will be permitted. A candidate who fails the resist will be required to undergo the corresponding theoretical training again before being allowed to make another attempt at the examination.

A1.5.5.2.3 A candidate who passes a written examination shall receive a certificate, statement or other record indicating which of the competences have been addressed, and the dates on which the corresponding training took place.

A1.5.5.3 Practical training

A1.5.5.3.1 A person authorized to carry out ISM audits shall have completed at least the minimum number of training audits under supervision as specified by the RO.

A1.5.5.3.2 The RO shall establish procedures for ensuring and demonstrating that the required competence has been achieved.

A1.6 Qualification

A1.6.1 After completion of the theoretical and practical training, with positive results, the trainee is granted the appropriate authorizations to work independently. The activities they are qualified to perform (types of surveys, types of ships, types of design approval, etc.) are identified.

A1.6.2 The criteria adopted by the RO for granting qualifications shall be documented in the appropriate quality management system documents.

A1.7 Assessment of training effectiveness

A1.7.1 The methods of training effectiveness assessment may include monitoring, testing, etc., on the regular basis according to the RO's system.

A1.7.2 The criteria adopted by the RO for training effectiveness assessment shall be documented in the appropriate RO quality management system documents.

A1.7.3 Evidence of training effectiveness assessment shall be provided.

A1.8 Maintenance of qualification

A1.8.1 The criteria adopted by the RO for maintenance or updating of qualifications shall be in accordance with and documented in the appropriate RO quality management system documents.

A1.8.2 Updating of qualifications may be done through the following methods:

.1 self-study (unassisted study);

.2 different courses and seminars organized in local offices and/or in the main offices of the RO;

.3 extraordinary technical seminars in case of significant changes in the RO's rules or international conventions, codes, etc. (with examination if required); and

.4 special training on specific works or type of survey in some areas of the activity, which are determined by activity monitoring or by a long time absence of practical experience.

A1.8.3 Maintenance of qualifications in accordance with these criteria shall be verified at annual performance review.

A1.9 Activity monitoring

A1.9.1 Purpose

Activity monitoring has the purpose:

.1 to assess whether the individuals are competent and capable of carrying out their authorized and assigned work independently, consistent with the RO's policies and practices;

.2 to identify needs for continual improvement in aligning the technical services across the organization; and

.3 to identify need for improvements in the guidance processes and/or tools provided for the staff.

A1.9.2 Monitoring

A1.9.2.1 Headquarters, regional or local offices, may initiate activity monitoring. It shall be carried out by persons who are qualified in the survey or audit being monitored.

A1.9.2.2 It shall be carried out to the extent that the work of each surveyor or auditor engaged in survey or audit work will be monitored at least once every other calendar year. Where a person carries out both survey and audit work, they shall be monitored in both work activities at least once every other calendar year. Only one type of survey for a qualified surveyor and one type of audit for a qualified auditor need be monitored within the two-year cycle. Persons doing plan approval shall be monitored at least once every other calendar year.

A1.9.2.3 Subsequent to the monitoring, the monitoring surveyor or auditor shall report the activity.

A1.9.2.4 Should any comments be necessary, or findings made, these will be included in the report, for review and corrective action.

A1.9.3 Method

A1.9.3.1 Activity monitoring shall be performed by personnel authorized to undertake activity monitoring.

A1.9.3.2 Preparation shall include familiarization with the processes, requirements and tools (e.g. software) associated with the activity to be witnessed during the activity monitoring.

A1.9.3.3 The monitoring process shall include a review of relevant performance information related to the individual's work. This may include: report and certificate accuracy, meeting objectives, received complaints, PSC detention feedback.

A1.9.3.4 Survey, audit or plan approval activity selected for monitoring shall have an extent such as to cover a maximum possible range of activity and qualifications that can be monitored during the attendance.

A1.9.3.5 Monitoring shall include, but not be limited to, evaluation of the individual's:

.1 personal safety awareness;

.2 understanding and application of the relevant requirements;

.3 technical capabilities;

.4 understanding of the related requirements; and

.5 standards of reporting and communication.

A1.9.4 Reporting

Subsequent to the monitoring, a report shall be made with conclusions with respect to:

.1 whether the individuals assessed are capable of carrying out their authorized and assigned work (including particularly positive aspects);

.2 any areas of improvement; and

.3 any recommended training requirements.

A1.9.5 Evaluation

The monitoring report shall be evaluated by management who will determine the individual's continued authorization or possible training requirements to obtain further authorization. The report shall be completed and reviewed annually.

A1.9.6 Implementation

The RO shall:

.1 document the activity monitoring methodology, including how it is reported;

.2 document how the authorization to undertake activity monitoring is achieved;

.3 document consequence and actions to undertake if activity-monitoring timing is exceeded;

.4 maintain records to demonstrate that all relevant staff has been monitored in the prescribed period; and

.5 maintain records to demonstrate level of technical performance and the effect of possible improvement activities across the organization through the analysis of activity monitoring.

A1.10 Training of support staff

Support staff shall have training and/or supervision commensurate with the tasks they are authorized to perform.

A1.11 Records

Records shall be maintained for each surveyor/plan approval staff member, indicating:

.1 formal education background;

.2 professional experience prior to joining the RO;

.3 evidence of theoretical training completed;

.4 evidence of practical training completed;

.5 evidence of examinations and tests;

.6 professional experience during employment at the RO; and

.7 periodical updating of knowledge.

* * *

Appendix 2

SPECIFICATIONS ON THE SURVEY AND CERTIFICATION FUNCTIONS OF RECOGNIZED ORGANIZATIONS ACTING ON BEHALF OF THE FLAG STATE

A2.1 SCOPE

A2.1.1 This document contains minimum specifications for organizations recognized as capable of performing statutory work on behalf of a flag State in terms of certification and survey functions connected with the issuance of international certificates.

A2.1.2 The principle of the system described below is to divide the specifications required into different elementary modules with a view to selecting the relevant modules for each function of certification and survey.

A2.2 AREAS OF INTEREST COVERED BY ELEMENTARY MODULES

.1 Management

.2 Technical appraisal

.3 Surveys

.4 Qualifications and training.

A2.2.1 Management

Module 1A: Management functions

The management of the RO shall have the competence, capability and capacity to organize, manage and control the performance of survey and certification functions in order to verify compliance with requirements relevant to the tasks delegated and shall, inter alia:

.1 possess an adequate number of competent supervisory, technical appraisal and survey personnel;

.2 provide for the development and maintenance of appropriate procedures and instructions;

.3 provide for the maintenance of up-to-date documentation on interpretation of the relevant instruments;

.4 give technical and administrative support to field staff; and

.5 provide for the review of survey reports and provision of experience feedback.

A2.2.2 Technical appraisal

Module 2A: Hull structure

The RO shall have the appropriate competence, capability and capacity to perform the following technical evaluations and/or calculations pertaining to:

.1 longitudinal strength;

.2 local scantlings such as plates and stiffeners;

.3 structural stress, fatigue and buckling analyses; and

.4 materials, welding and other pertinent methods of material-joining, for compliance with relevant rules and convention requirements pertaining to design, construction and safety.

Module 2B: Machinery systems

The RO shall have the appropriate competence, capability and capacity to perform technical evaluations and/or calculations pertaining to:

.1 propulsion, auxiliary machinery and steering gear;

.2 piping; and

.3 electrical and automation systems,

for compliance with relevant rules and convention requirements pertaining to design, construction and safety.

Module 2C: Subdivision and stability

The RO shall have the appropriate competence, capability and capacity to perform technical evaluations and/or calculations pertaining to:

.1 intact and damage stability;

.2 inclining test assessment;

.3 grain loading stability; and

.4 watertight and weathertight integrity.

Module 2D: Load line

The RO shall have the appropriate competence, capability and capacity to perform the following technical evaluations and/or calculations pertaining to:

.1 freeboard calculation; and

.2 conditions of assignment of freeboard.

Module 2E: Tonnage

The RO shall have the appropriate competence, capability and capacity to perform technical evaluations and/or calculations pertaining to tonnage computation.

Module 2F: Structural fire protection

The RO shall have the appropriate competence, capability, and capacity to perform technical evaluations and/or calculations pertaining to:

.1 structural fire protection and fire isolation;

.2 use of combustible materials;

.3 means of escape; and

.4 ventilation systems.

Module 2G: Safety equipment

The RO shall have the appropriate competence, capability and capacity to perform technical evaluations and/or calculations pertaining to:

.1 life-saving appliances and arrangements;

.2 navigation equipment;

.3 fire detection and fire alarm systems and equipment;

.4 fire-extinguishing system and equipment;

.5 fire control plans;

.6 pilot ladders and pilot hoists;

.7 lights, shapes and sound signals; and

.8 inert gas systems.

Module 2H: Oil pollution prevention

The RO shall have the appropriate competence, capability and capacity to perform technical evaluations and/or calculations pertaining to:

.1 monitoring and control of oil discharge;

.2 segregation of oil and ballast water;

.3 crude oil washing;

.4 protective location of segregated ballast spaces;

.5 pumping, piping and discharge arrangements; and

.6 shipboard oil pollution emergency plans (SOPEPs).

Module 2I: NLS pollution prevention

The RO shall have the appropriate competence, capability and capacity to perform technical evaluations and/or calculations pertaining to:

.1 list of substances the ship may carry;

.2 pumping system;

.3 stripping system;

.4 tank-washing system and equipment; and

.5 underwater discharge arrangements.

Module 2J: Radio

The RO shall have the appropriate competence, capability and capacity to perform technical evaluations pertaining to:

.1 radiotelephony;

.2 radiotelegraphy; and

.3 GMDSS.

Alternatively, a professional radio installation inspection service company approved and monitored by the RO according to an established and documented programme may perform these services. This programme is to include the definition of the specific requirements the company and its radio technicians shall satisfy.

Module 2K: Carriage of dangerous chemicals in bulk

The RO shall have the appropriate competence, capability and capacity to perform technical evaluations and/or calculations pertaining to:

.1 ship arrangement and ship survival capacity;

.2 cargo containment and material of construction;

.3 cargo temperature control and cargo transfer;

.4 cargo tank vent systems and environmental control;

.5 personnel protection; operational requirements; and

.6 list of chemicals the ship may carry.

Module 2L: Carriage of liquefied gases in bulk

The RO shall have the appropriate competence, capability and capacity to perform technical evaluations and/or calculations pertaining to:

.1 ship arrangement and ship survival capacity;

.2 cargo containment and material of construction;

.3 process pressure vessels and liquid, vapour and pressure piping systems;

.4 cargo tank vent systems and environmental control;

.5 personnel protection;

.6 use of cargo as fuel; and

.7 operational requirements.

A2.2.3 Surveys

Module 3A: Survey functions

The RO shall have the appropriate competence, capability and capacity to perform the required surveys under controlled conditions as per the RO's internal quality management system and, representing an adequate geographical coverage and local representation as required. The work to be covered by the staff is described in the relevant sections of the appropriate survey guidelines developed by the Organization.

A2.2.4 Qualifications and training

Module 4A: General qualifications

RO personnel performing, and responsible for, statutory work shall meet, as a minimum, the requirements defined in part 2, section 4.2.5.

Module 4B: Radio survey qualifications

A professional radio installation inspection service company, approved and monitored by the RO according to an established and documented programme, may do surveys. This programme is to include the definition of the specific requirements the company and its radio technicians shall satisfy, including, inter alia, requirements for internal tutored training covering at least:

.1 radiotelephony;

.2 radiotelegraphy;

.3 GMDSS; and

.4 initial and renewal surveys.

Radio technicians carrying out surveys shall have successfully completed, as a minimum, at least one year of relevant technical school training, the internal tutored training programme of his/her employer and at least one year of experience as an assistant radio technician. For exclusive radio surveyors to the RO, equivalent requirements as above apply.

A2.3 SPECIFICATIONS PERTAINING TO THE VARIOUS CERTIFICATES

A2.3.1 Passenger ship safety certificate

Initial certification, renewal survey

A2.3.1.1 Module Nos. 1A, 2A, 2B, 2C, 2D, 2F, 2G, 2J, 3A, 4A and 4B apply.

A2.3.1.2 For this certification, the system shall cover practical tutored training on the following issues as appropriate for Technical Appraisal and Support staff (TS) and Field Surveyors (FS), respectively:

.1 TS: SOLAS 74, as amended.

.2 FS: SOLAS 74, as amended:

.1 initial survey, report, and issuance of certificate; and

.2 renewal survey, report- and issuance of certificate.

A2.3.2 Cargo ship safety construction certificate

Initial certification, annual/intermediate, renewal surveys

A2.3.2.1 Module Nos. 1A, 2A, 2B, 2C, 2F, 3A and 4A apply.

A2.3.2.2 For this certification the system shall cover practical tutored training on the following issues as appropriate for Technical Appraisal and Support staff (TS) and Field Surveyors (FS), respectively:

.1 TS: SOLAS 74 chapters II-1, II-2 and XII with any amendments and appropriate classification rules.

.2 FS: Pertinent technical surveys (class surveys or similar), newbuilding:

.1 hull structure and equipment; and

.2 machinery and systems installation and testing.

.3 FS: Pertinent technical surveys (class surveys or similar), ships in operation:

.1 annual/intermediate survey;

.2 renewal survey; and

.3 bottom survey.

.4 FS: SOLAS 74 chapters II-1, II-2 and XII, as amended:

.1 initial survey, report, issuance of certificate;

.2 annual/intermediate survey and report; and

.3 renewal survey, report and issuance of certificate.

A2.3.3 Cargo ship safety equipment certificate

Initial certification, annual, periodical, renewal surveys

A2.3.3.1 Module Nos. 1A, 2G, 3A and 4A apply.

A2.3.3.2 For this certification the system shall cover practical tutored training on the following issues as appropriate for Technical Appraisal and Support staff (TS) and Field Surveyors (FS), respectively:

.1 TS: SOLAS 74 chapters II-1, II-2, III and V, as amended, and applicable aspects of COLREG 72, as amended.

.2 FS: SOLAS 74 chapters II-1, II-2, III and V, as amended, and applicable aspects of COLREG 72, as amended:

.1 initial survey, report and issuance of certificate;

.2 annual/periodical survey and report; and

.3 renewal survey, report and issuance of certificate.

A2.3.4 Cargo ship safety radio certificate

Initial certification, periodical, renewal surveys

A2.3.4.1 Module Nos. 1A, 2J, 3A and 4B apply.

A2.3.4.2 For this certification the system shall cover practical tutored training on the following issues for Technical Appraisal and Support staff (TS) and Field Surveyors (FS) respectively:

.1 TS: SOLAS 74 chapter IV, as amended.

.2 FS: Reference Module 4B.

A2.3.5 International Safety Management Code certification

Initial certification, annual/intermediate verifications, renewal certification

A2.3.5.1 All of the modules, with the exception of 2E (tonnage), apply to the extent that they relate to an RO's ability to identify and evaluate the mandatory rules and regulations with which a company's safety management system and ships shall comply.

A2.3.5.2 For this certification, the system shall comply with the qualification and training requirements for ISM Code assessors contained in the *Guidelines on Implementation of the International Safety Management (ISM) Code by Administrations*.

A2.3.6 International load line certificate

Initial certification, annual, renewal surveys

A2.3.6.1 Module Nos. 1A, 2A, 2C, 2D, 3A and 4A apply.

A2.3.6.2 For this certification, the system shall cover practical tutored training on the following issues as appropriate for Technical Appraisal and Support staff (TS) and Field Surveyors (FS), respectively:

.1 TS: Calculation of freeboard and approval of drawings for conditions of assignment according to ILLC 1966.

.2 FS: Pertinent technical surveys (class surveys or similar), newbuilding:

.1 hull structural survey;

.2 hull penetrations and closing appliances; and

.3 stability/inclining test.

.3 FS: Pertinent technical surveys (class surveys or similar), ships in operation:

.1 annual survey;

.2 renewal survey; and

.3 bottom survey.

.4 FS: Measurement for load line/initial survey report.

.5 FS: Conditions for assignment/initial survey report.

.6 FS: Load line marking verification/initial survey report.

.7 FS: Load line annual survey.

.8 FS: Load line renewal survey, report and issuance of certificate.

A2.3.7 International oil pollution prevention certificate

Initial certification, annual, intermediate, renewal surveys

A2.3.7.1 Module Nos. 1A, 2A, 2B, 2C, 2H, 3A and 4A apply.

A2.3.7.2 For this certification, the system shall cover practical tutored training on the following issues as appropriate for Technical Appraisal and Support staff (TS) and Field Surveyors (FS), respectively:

.1 TS: Approval of drawings and manuals according to MARPOL, Annex I.

.2 FS: MARPOL, Annex I, as amended:

.1 initial survey, report and issuance of certificate;

.2 annual/intermediate survey and report; and

.3 renewal survey, report and issuance of certificate.

A2.3.8 International pollution prevention certificate for the carriage of noxious liquid substances in bulk

Initial certification, annual, intermediate, renewal surveys

A2.3.8.1 Module Nos. 1A, 2A, 2B, 2C, 2I, 3A and 4A apply.

A2.3.8.2 For this certification the system shall cover practical tutored training on the following issues as appropriate for Technical Appraisal and Support staff (TS) and Field Surveyors (FS), respectively:

.1 TS: Approval of drawings and manuals according to MARPOL, Annex II and appropriate codes.

.2 FS: MARPOL, Annex II and appropriate codes:

.1 initial survey, report and issuance of certificate;

.2 annual/intermediate survey and report; and

.3 renewal survey, report and issuance of certificate.

A2.3.9 International certificate of fitness for the carriage of dangerous chemicals in bulk

Initial certification, annual, intermediate, renewal surveys

A2.3.9.1 Module Nos. 1A, 2A, 2B, 2C, 2K, 3A and 4A apply.

A2.3.9.2 For this certification the system shall cover practical tutored training on the following issues as appropriate for Technical Appraisal and Support staff (TS) and Field Surveyors (FS), respectively:

.1 TS: Approval of drawings and manuals according to International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code).

.2 FS: IBC Code:

.1 initial survey, report and issuance of certificate;

.2 annual/intermediate survey and report; and

.3 renewal survey, report and issuance of certificate.

A2.3.10 International certificate of fitness for the carriage of liquefied gases in bulk

Initial certification, annual, intermediate, renewal surveys

A2.3.10.1 Module Nos. 1A, 2A, 2B, 2C, 2L, 3A and 4A apply.

A2.3.10.2 For this certification the system shall cover practical tutored training on the following issues as appropriate for Technical Appraisal and Support staff (TS) and Field Surveyors (FS), respectively:

.1 TS: Approval of drawings and manuals according to International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code).

.2 FS: IGC Code:

.1 initial survey, report and issuance of certificate;

.2 annual/intermediate survey and report; and

.3 renewal survey, report and issuance of certificate.

A2.3.11 International tonnage certificate (1969)

Initial certification

A2.3.11.1 Module Nos. 1A, 2E and 4A apply.

A2.3.11.2 For this certification the system shall cover practical tutored training on the following issues as appropriate for Technical Appraisal and Support staff (TS) and Field Surveyors (FS), respectively:

.1 TS: Measurement and computation of tonnage according to:

.1 1969 Tonnage Measurement Convention; and

.2 Pertinent IMO resolutions.

.2 FS: Marking survey and report.

* * *

Appendix 3

ELEMENTS TO BE INCLUDED IN AN AGREEMENT

A formal written agreement or equivalent between the flag State and the RO should, as a minimum, cover the following items:

1 Application

2 Purpose

3 General conditions

4 The execution of functions under authorization:

.1 Functions in accordance with the general authorization

.2 Functions in accordance with special (additional) authorization

.3 Relationship between the organization's statutory and other related activities

.4 Functions to cooperate with port States to facilitate the rectification of reported port State control deficiencies or the discrepancies within the organization's purview

5 Legal basis of the functions under authorization:

.1 Acts, regulations and supplementary provisions

.2 Interpretations

.3 Deviations and equivalent solutions

6 Reporting to the flag State:

.1 Procedures for reporting in the case of general authorization

.2 Procedures for reporting in the case of special authorization

.3 Reporting on classification of ships (assignment of class, alterations and cancellations), as applicable

.4 Reporting of cases where a ship did not in all respects remain fit to proceed to sea without danger to the ship or persons on board or presenting unreasonable threat of harm to the environment

.5 Other reporting

7 Development of rules and/or regulations – Information:

.1 Cooperation in connection with development of rules and/or regulations – liaison meetings

.2 Exchange of rules and/or regulations and information

.3 Language and form

8 Other conditions:

.1 Remuneration

.2 Rules for administrative proceedings

.3 Confidentiality

.4 Liability[3]

.5 Financial responsibility

.6 Entry into force

.7 Termination

.8 Breach of agreement

.9 Settlement of disputes

.10 Use of subcontractors

.11 Issue of the agreement

.12 Amendments

9 Specification of the authorization from the flag State to the organization:

.1 Ship types and sizes

.2 Conventions and other instruments, including relevant national legislation

.3 Approval of drawings

.4 Approval of material and equipment

.5 Surveys

[3] ROs and its employees who are involved in or responsible for delivery of statutory certification and services may be required by the law of the flag State to be covered by professional indemnity or professional liability insurance in the event that liability is finally and definitively imposed on the flag State for loss or damage which is proved in a court of law to have been caused by any negligent act or omission by its RO. In this connection, the flag State may also consider placing a limitation on the level of liability and indemnification to be covered under that insurance or other compensation arrangements.

.6 Issuance of certificates

.7 Corrective actions

.8 Withdrawal of certificates

.9 Reporting

10 The flag State's supervision of duties delegated to the organization:

.1 Documentation of quality assurance system

.2 Access to internal instructions, circulars and guidelines

.3 Access by the flag State to the organization's documentation relevant to the flag State's fleet

.4 Cooperation with the flag State's inspection and verification work

.5 Provision of information and statistics on, e.g. damage and casualties relevant to the flag State's fleet.

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ANNEX 2

RESOLUTION MSC.350(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"), concerning the amendment procedure applicable to the annex to the Convention, other than to the provisions of chapter I thereof,

HAVING CONSIDERED, at its ninety-second session, amendments to the Convention, proposed and circulated in accordance with article VIII(b)(i) thereof,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in the annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2014, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES SOLAS Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2015 upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5. ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

* * *

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

CHAPTER III
LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Part B
Requirements for ships and life-saving appliances

Regulation 19 – Emergency training and drills

1 The existing text of paragraphs 2.2 and 2.3 is replaced with the following:

"2.2 On a ship engaged on a voyage where passengers are scheduled to be on board for more than 24 h, musters of newly-embarked passengers shall take place prior to or immediately upon departure. Passengers shall be instructed in the use of the lifejackets and the action to take in an emergency.

2.3 Whenever new passengers embark, a passenger safety briefing shall be given immediately before departure, or immediately after departure. The briefing shall include the instructions required by regulations 8.2 and 8.4, and shall be made by means of an announcement, in one or more languages likely to be understood by the passengers. The announcement shall be made on the ship's public address system, or by other equivalent means likely to be heard at least by the passengers who have not yet heard it during the voyage. The briefing may be included in the muster required by paragraph 2.2. Information cards or posters or video programmes displayed on ships video displays may be used to supplement the briefing, but may not be used to replace the announcement."

2 After existing paragraph 3.2, a new paragraph 3.3 is inserted as follows:

"3.3 Crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill to be held on board the ship at least once every two months."

3 Existing sections 3.3 and 3.4 are renumbered as 3.4 and 3.5, respectively. In the renumbered paragraph 3.4.2, the reference "paragraph 3.3.1.5" is replaced by the reference "paragraph 3.4.1.5"; and in the renumbered paragraph 3.4.3, the reference "paragraphs 3.3.4 and 3.3.5" is replaced by the reference "paragraphs 3.4.4 and 3.4.5"

4 After the renumbered section 3.5, the following new section is added:

"3.6 Enclosed space entry and rescue drills

3.6.1 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization[*].

[*] Refer to the *Revised Recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).

3.6.2 Each enclosed space entry and rescue drill shall include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of instruments for measuring the atmosphere in enclosed spaces;

.4 checking and use of rescue equipment and procedures; and

.5 instructions in first aid and resuscitation techniques."

5 In paragraph 4.2, at the end of subparagraph .3, the word "and" is deleted; at the end of subparagraph .4, the period "." is replaced by the word "; and"; and after subparagraph .4, the following new subparagraph is added:

".5 risks associated with enclosed spaces and onboard procedures for safe entry into such spaces which should take into account, as appropriate, the guidance provided in recommendations developed by the Organization*.

* Refer to the *Revised Recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

6 In paragraph 5, after the words "fire drills,", the words "enclosed space entry and rescue drills," are inserted.

CHAPTER V
SAFETY OF NAVIGATION

Regulation 19 – Carriage requirements for shipborne navigational systems and equipment

7 In subparagraph 1.2.1, the words "1.2.2 and 1.2.3" are replaced with the words "1.2.2, 1.2.3 and 1.2.4".

8 In subparagraph 1.2.2, the word "and" at the end of the subparagraph is deleted and in subparagraph 1.2.3, the full stop "." is replaced with the word "; and".

9 After the existing subparagraph 1.2.3, the following new subparagraph is added:

".4 be fitted with the system required in paragraph 2.2.3, as follows:

.1 passenger ships irrespective of size, not later than the first survey* after 1 January 2016;

.2 cargo ships of 3,000 gross tonnage and upwards, not later than the first survey* after 1 January 2016;

.3 cargo ships of 500 gross tonnage and upwards but less than 3,000 gross tonnage, not later than the first survey* after 1 January 2017; and

.4 cargo ships of 150 gross tonnage and upwards but less than 500 gross tonnage, not later than the first survey* after 1 January 2018.

The bridge navigational watch alarm system shall be in operation whenever the ship is underway at sea.

The provisions of paragraph 2.2.4 shall also apply to ships constructed before 1 July 2002.

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* Refer to the Unified interpretation of the term first survey referred to in SOLAS regulations (MSC.1/Circ.1290)."

10 After the new subparagraph 1.2.4, the following new paragraph is added:

"1.3 Administrations may exempt ships from the application of the requirement of paragraph 1.2.4 when such ships will be taken permanently out of service within two years after the implementation date specified in subparagraphs 1.2.4.1 to 1.2.4.4."

CHAPTER XI-1
SPECIAL MEASURES TO ENHANCE MARITIME SAFETY

Regulation 1 – Authorization of recognized organizations

11 The existing text of regulation 1 is replaced with the following:

"The Administration shall authorize organizations, referred to in regulation I/6, including classification societies, in accordance with the provisions of the present Convention and with the Code for Recognized Organizations (RO Code), consisting of part 1 and part 2 (the provisions of which shall be treated as mandatory) and part 3 (the provisions of which shall be treated as recommendatory), as adopted by the Organization by resolution MSC.349(92), as may be amended by the Organization, provided that:

(a) amendments to part 1 and part 2 of the RO Code are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention;

(b) amendments to part 3 of the RO Code are adopted by the Maritime Safety Committee in accordance with its Rules of Procedure; and

(c) any amendments adopted by the Maritime Safety Committee and the Marine Environment Protection Committee are identical and come into force or take effect at the same time, as appropriate."

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ANNEX 3

RESOLUTION MSC.351(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 1994 (1994 HSC CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.36(63), by which it adopted the *International Code of Safety for High-Speed Craft* (hereinafter referred to as "the 1994 HSC Code"), which has become mandatory under chapter X of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation X/1.1 of the Convention concerning the procedure for amending the 1994 HSC Code,

HAVING CONSIDERED, at its ninety-second session, amendments to the 1994 HSC Code proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the International Code of Safety for High-Speed Craft (1994 HSC Code), the text of which is set out in the annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 July 2014 unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2015 upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5. ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization, which are not Contracting Governments to the Convention.

* * *

ANNEX

AMENDMENTS TO THE THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 1994 (1994 HSC CODE)

CHAPTER 18
OPERATIONAL REQUIREMENTS

1 After existing paragraph 18.5.3, a new paragraph is inserted as follows:

"18.5.4 Crew members with enclosed space entry or rescue responsibilities should participate in an enclosed space entry and rescue drill, to be held on board the craft, at least once every two months."

2 The existing paragraphs 18.5.4 to 18.5.10 are renumbered as 18.5.5 to 18.5.11, respectively.

3 The first sentence of the renumbered paragraph 18.5.8 is amended to read:

"18.5.8 Records

The date when musters are held, details of abandon craft drills and fire drills, drills of other life-saving appliances, enclosed space entry and rescue drills, and onboard training should be recorded in such logbook as may be prescribed by the Administration."

4 After renumbered paragraph 18.5.11, a new subsection is inserted as follows:

"18.5.12 Enclosed space entry and rescue drills

18.5.12.1 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization*.

* Refer to the *Revised Recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).

18.5.12.2 Each enclosed space entry and rescue drill should include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of instruments for measuring the atmosphere in enclosed spaces;

.4 checking and use of rescue equipment and procedures; and

.5 instructions in first aid and resuscitation techniques.

18.5.12.3 The risks associated with enclosed spaces and onboard procedures for safe entry into such spaces which should take into account, as appropriate, the guidance provided in recommendations developed by the Organization*.

* Refer to the *Revised Recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

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ANNEX 4

RESOLUTION MSC.352(92)
(adopted on 21 June 2013)

AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 2000 (2000 HSC CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.97(73), by which it adopted the *International Code of Safety for High-Speed Craft, 2000* (hereinafter referred to as "the 2000 HSC Code"), which has become mandatory under chapter X of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation X/1.2 of the Convention concerning the procedure for amending the 2000 HSC Code,

HAVING CONSIDERED, at its ninety-second session, amendments to the 2000 HSC Code proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the 2000 HSC Code, the text of which is set out in the annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 July 2014 unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2015 upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5. ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization, which are not Contracting Governments to the Convention.

* * *

ANNEX

AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 2000 (2000 HSC CODE)

CHAPTER 18
OPERATIONAL REQUIREMENTS

1 After existing paragraph 18.5.3, a new paragraph is inserted as follows:

"18.5.4 Crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill, to be held on board the craft, at least once every two months."

2 The existing paragraphs 18.5.4 to 18.5.10 are renumbered as 18.5.5 to 18.5.11, respectively.

3 The first sentence of the renumbered paragraph 18.5.8.1 is amended to read:

"18.5.8.1 The date when musters are held, details of abandon craft drills and fire drills, drills of other life-saving appliances, enclosed space entry and rescue drills, and onboard training shall be recorded in such log-book as may be prescribed by the Administration."

4 After renumbered paragraph 18.5.11, a new subsection is inserted as follows:

"18.5.12 Enclosed space entry and rescue drills

18.5.12.1 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization*.

* Refer to the *Revised Recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).

18.5.12.2 Each enclosed space entry and rescue drill shall include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of instruments for measuring the atmosphere in enclosed spaces;

.4 checking and use of rescue equipment and procedures; and

.5 instructions in first aid and resuscitation techniques.

18.5.12.3 The risks associated with enclosed spaces and onboard procedures for safe entry into such spaces which should take into account, as appropriate, the guidance provided in recommendations developed by the Organization*.

* Refer to the *Revised Recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

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ANNEX 5

RESOLUTION MSC.353(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE INTERNATIONAL MANAGEMENT CODE FOR THE SAFE OPERATION OF SHIPS AND FOR POLLUTION PREVENTION (INTERNATIONAL SAFETY MANAGEMENT (ISM) CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution A.741(18), by which the Assembly adopted the *International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code)* (hereinafter referred to as "the ISM Code"), which has become mandatory under chapter IX of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation IX/1.1 of the Convention concerning the procedure for amending the ISM Code,

HAVING CONSIDERED, at its ninety-second session, amendments to the ISM Code proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the ISM Code, the text of which is set out in the annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 July 2014 unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2015 upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5. ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization, which are not Contracting Governments to the Convention.

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ANNEX

AMENDMENTS TO THE INTERNATIONAL MANAGEMENT CODE FOR THE SAFE OPERATION OF SHIPS AND FOR POLLUTION PREVENTION (INTERNATIONAL SAFETY MANAGEMENT (ISM) CODE)

PART A – IMPLEMENTATION

6 RESOURCES AND PERSONNEL

1 The existing text of paragraph 6.2 is replaced with the following:

"6.2 The Company should ensure that each ship is:

.1 manned with qualified, certificated and medically fit seafarers in accordance with national and international requirements; and

.2 appropriately manned in order to encompass all aspects of maintaining safe operations on board*.

* Refer to the *Principles of minimum safe manning*, adopted by the Organization by resolution A.1047(27)."

12 COMPANY VERIFICATION, REVIEW AND EVALUATION

2 The following new paragraph 12.2 is inserted after existing paragraph 12.1 and the existing paragraphs 12.2 to 12.6 are renumbered as 12.3 to 12.7:

"12.2 The Company should periodically verify whether all those undertaking delegated ISM-related tasks are acting in conformity with the Company's responsibilities under the Code."

Footnotes and paragraph for foreword of the publication of the Code

1 In paragraph 1.1.10, the following footnote is added after the words "Major non-conformity":

"Refer to the *Procedures concerning observed ISM Code major non-conformities* (MSC/Circ.1059-MEPC/Circ.401)."

2 In paragraph 1.2.3.2, the following footnote is added after the word "account":

"Refer to the *List of codes, recommendations, guidelines and other safety and security-related non-mandatory instruments* (MSC.1/Circ.1371)."

3 The following footnote is added at the end of the title of section 3:

"Refer to the *Guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies* (MSC-MEPC.7/Circ.5)."

4 The following footnote is added at the end of the title of section 4:

"Refer to the *Guidance on the qualifications, training and experience necessary for undertaking the role of the Designated Person under the provisions of the International Safety Management* (ISM) Code (MSC-MEPC.7/Circ.6)."

5 The following footnote is added at the end of the title of section 8:

"Refer to the *Guidelines for a structure of an integrated system of contingency planning for shipboard emergencies*, adopted by the Organization by resolution A.852(20), as amended."

6 The following footnote is added at the end of the title of section 9:

"Refer to the *Guidance on near-miss reporting* (MSC-MEPC.7/Circ.7)."

7 The following footnote is added at the end of the title of section 11:

"Refer to the *Revised list of certificates and documents required to be carried on board ships* (FAL.2/Circ.127, MEPC.1/Circ.817 and MSC.1/Circ.1462)."

8 The following new paragraph is added to the foreword of the publication of the Code:

"The footnotes given in this Code are inserted for reference and guidance purposes and do not constitute requirements under the Code. However, in accordance with paragraph 1.2.3.2, all relevant guidelines, recommendations, etc. should be taken into account. In all cases the reader must make use of the latest versions of the referenced texts of the document specified in a footnote, bearing in mind that such texts may have been revised or superseded by updated material."

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ANNEX 6

RESOLUTION MSC.354(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.268(85) by which it adopted the *International Maritime Solid Bulk Cargoes Code* (hereinafter referred to as "the IMSBC Code"), which has become mandatory under chapters VI and VII of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation VI/1-1.1 of the Convention concerning the amendment procedure for amending the IMSBC Code,

HAVING CONSIDERED, at its ninety-second session, amendments to the IMSBC Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the IMSBC Code, the text of which is set out in the annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2014, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2015 upon their acceptance in accordance with paragraph 2 above;

4. AGREES that Contracting Governments to the Convention may apply the aforementioned amendments in whole or in part on a voluntary basis as from 1 January 2014;

5. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

6. ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

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ANNEX

AMENDMENTS TO THE INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE

Section 1 – General provisions

1.3 Cargoes not listed in this Code

1.3.3 Format for the properties of cargoes not listed in this Code and conditions of the carriage

1 At the end of the title, insert a footnote "*" with the following:

"* Refer to MSC.1/Circ.1453 on *Guidelines for the submission of information and completion of the format for the properties of cargoes not listed in the International Maritime Solid Bulk Cargoes (IMSBC) Code and their conditions of carriage*, according to subsection 1.3.3 of the IMSBC Code."

1.4 Application and implementation of this Code

2 Replace the last sentence of paragraph 1.4.2 with the following:

"The texts in the sections for "Description", "Characteristics (other than CLASS and GROUP)", "Hazard" and "Emergency procedures" of individual schedules of solid bulk cargoes in appendix 1."

1.7 Definitions

3 Insert the following new definitions in alphabetical order:

"*GHS* means the fourth revised edition of the Globally Harmonized System of Classification and Labelling of Chemicals, published by the United Nations as document ST/SG/AC.10/30/Rev.4."

"*Manual of Tests and Criteria* means the fifth revised edition of the United Nations publication entitled "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.5/Amendment 1)"

"*Potential sources of ignition* means, but is not limited to, open fires, machinery exhausts, galley uptakes, electrical outlets and electrical equipment unless they are of certified safe type*.

* For cargo spaces, refer to SOLAS II-2/19.3.2."

"*Sources of heat* means heated ship structures, where the surface temperature is liable to exceed 55ºC. Examples of such heated structures are steam pipes, heating coils, top or side walls of heated fuel and cargo tanks, and bulkheads of machinery spaces."

and all numerical references to definitions are deleted, keeping them in alphabetical order only.

4 Insert a new sentence at end of definition of *Competent authority* as follows:

"The competent authority shall operate independently from the shipper."

Section 3 – Safety of personnel and ship

3.6 Cargo under in-transit fumigation

5 The existing text under 3.6 is renumbered as 3.6.1.

6 Insert new paragraphs 3.6.2 and 3.6.3 as follows:

"3.6.2 When a fumigant is used, such as phosphine gas, for fumigation-in-transit, due consideration shall be given to the severe toxicity of fumigants, taking into account that fumigants may enter into occupied spaces despite many precautions taken. In particular, in the case that fumigant leaks from a cargo hold under fumigation, the possibility should be kept in mind that it may enter the engine-room via pipe tunnels, ducts, and piping of any kind, including wiring ducts on or below deck, or dehumidifier systems that may be connected to parts of the cargo hold or compartments of the engine-room. Attention shall be given to potential problem areas such as bilge and cargo line systems and valves*. In all cases, ventilation procedures on board the ship during the voyage, should be scrutinized with regard to the possibility of drawing in the fumigant gas such as by incorrect ventilation procedures and settings, vacuum creation due to incorrect closing devices or flap settings, air conditioning and closed loop ventilation of the accommodation. Prior to commencement of fumigation procedures, it should be verified that ventilation flaps and closing devices are set correctly and that means of closing and sealing of all the bulkhead openings (such as doors and manholes) leading from the engine-room to piping tunnels/duct keels and other spaces that in case of leaks could become unsafe to enter during the fumigation are effective, confirmed closed and have warning signs posted.*

* Refer to subsection 3.3.2.10 of MSC.1/Circ.1264 as amended by MSC.1/Circ.1396.

3.6.3 Gas concentration safety checks shall also be made at all appropriate locations, which shall at least include: accommodation; engine-rooms; areas designated for use in navigation of the ship; and frequently visited working areas and stores, such as the forecastle head spaces, adjacent to cargo holds being subject to fumigation in transit, shall be continued throughout the voyage at least at eight-hour intervals or more frequently if so advised by the fumigator-in-charge. Special attention shall also be paid to potential problem areas such as bilge and cargo line systems. These readings shall be recorded in the ship's logbook."

Section 4 – Assessment of acceptability of consignments for safe shipment

4.3 Certificates of test

7 Replace the first sentence of paragraph 4.3.2 with the following:

"When a concentrate or other cargo which may liquefy is carried, the shipper shall provide the ship's master or his representative with a signed certificate of the TML, and a signed certificate or declaration of the moisture content, each issued by an entity recognized by the Competent Authority of the port of loading."

8 Insert new paragraph 4.3.3 with the accompanying footnote as follows:

"4.3.3 When a concentrate or other cargo which may liquefy is carried, procedures for sampling, testing and controlling moisture content to ensure the moisture content is less than the TML when it is on board the ship shall be established by the shipper, taking account of the provisions of this Code. Such procedures shall be approved and their implementation checked by the competent authority of the port of loading*. The document issued by the competent authority stating that the procedures have been approved shall be provided to the master or his representative.

* Refer to MSC.1/Circ1454 on *Guidelines for developing and approving procedures for sampling, testing and controlling the moisture content for solid bulk cargoes which may liquefy*."

9 Insert new paragraph 4.3.4 as follows:

"4.3.4 If the cargo is loaded on to the ship from barges, in developing the procedures under 4.3.3 the shipper shall include procedures to protect the cargo on the barges from any precipitation and water ingress."

and renumber the existing paragraphs 4.3.3 and 4.3.4 as 4.3.5 and 4.3.6, respectively.

10 A new sentence is inserted to the end of the new paragraph 4.3.6 as follows:

"However, it is important to ensure that the samples taken are representative of the whole depth of the stockpile."

4.4 Sampling procedures

11 Insert new paragraph 4.4.3 as follows:

"4.4.3 For a concentrate or other cargo which may liquefy, the shipper shall facilitate access to stockpiles for the purpose of inspection, sampling and subsequent testing by the ship's nominated representative."

12 Renumber the existing paragraphs 4.4.3, 4.4.4, 4.4.5 and 4.4.6 as 4.4.4, 4.4.5, 4.4.6 and 4.4.7, respectively.

13 In the renumbered paragraph 4.4.6, replace the sentence "Samples shall be immediately placed in suitable sealed containers which are properly marked" with the sentence "Samples for moisture testing shall be immediately placed in suitable airtight, non-absorbent containers with a minimum of free air space to minimize any change in moisture content, such containers being properly marked".

14 Insert a new paragraph 4.4.8 as follows:

"4.4.8 For unprocessed mineral ores the sampling of stationary stockpiles shall be carried out only when access to the full depth of the stockpile is available and samples from the full depth of the stockpile can be extracted."

15 In subsection 4.7, the existing reference "ISO 3082:1998" is replaced with the following:

"ISO 3082:2009 – Iron ores – Sampling and sample preparation procedures.

(Note: Under this Standard the in situ sampling of ships and stockpiles is not permitted)."

16 A new reference in subsection 4.7 is inserted after "ISO 3082:2009" as follows:

"IS1405:2010 – Iron Ores – Sampling & Sample Preparation – Manual Method.

(Note: This Indian Standard covers the in situ sampling of stockpiles up to a height of 3 m)."

Section 7 – Cargoes that may liquefy

7.2 Conditions for hazards

17 The existing paragraph 7.2.2 is replaced with the following:

"7.2.2 Liquefaction does not occur when the cargo consists of large particles or lumps and water passes through the spaces between the particles and there is no increase in the water pressure."

Section 8 – Test procedures for cargoes that may liquefy

8.4 Complementary test procedure for determining the possibility of liquefaction

18 The existing paragraph under subsection 8.4 is numbered as 8.4.1.

19 Insert a new paragraph 8.4.2 as follows:

"8.4.2 If samples remain dry following a can test, the moisture content of the material may still exceed the Transportable Moisture Limit (TML)."

Section 9 – Materials possessing chemical hazards

9.2 Hazard classification

9.2.3 *Materials hazardous only in bulk (MHB)*

20 In paragraph 9.2.3, replace the existing text under the heading with the following:

"**9.2.3.1 General**

9.2.3.1.1 These are materials which possess chemical hazards when transported in bulk other than materials classified as packaged dangerous goods in the IMDG Code. These materials present a significant risk when carried in bulk and require special precautions.

9.2.3.1.2 A material shall be classified as MHB if the material possesses one or more of the chemical hazards as defined below. When a test method is prescribed, representative samples of the cargo to be carried shall be used for testing. Samples shall be taken 200 to 360 mm inward from the surface at 3 m intervals over the length of a stockpile.

9.2.3.1.3 A material may also be classified as MHB by analogy with similar cargoes with known hazardous properties or by records of accidents.

9.2.3.2 Combustible solids

9.2.3.2.1 These are materials which are readily combustible or easily ignitable when transported in bulk and do not meet the established criteria for inclusion in class 4.1 (see 9.2.2.1 of the IMSBC Code).

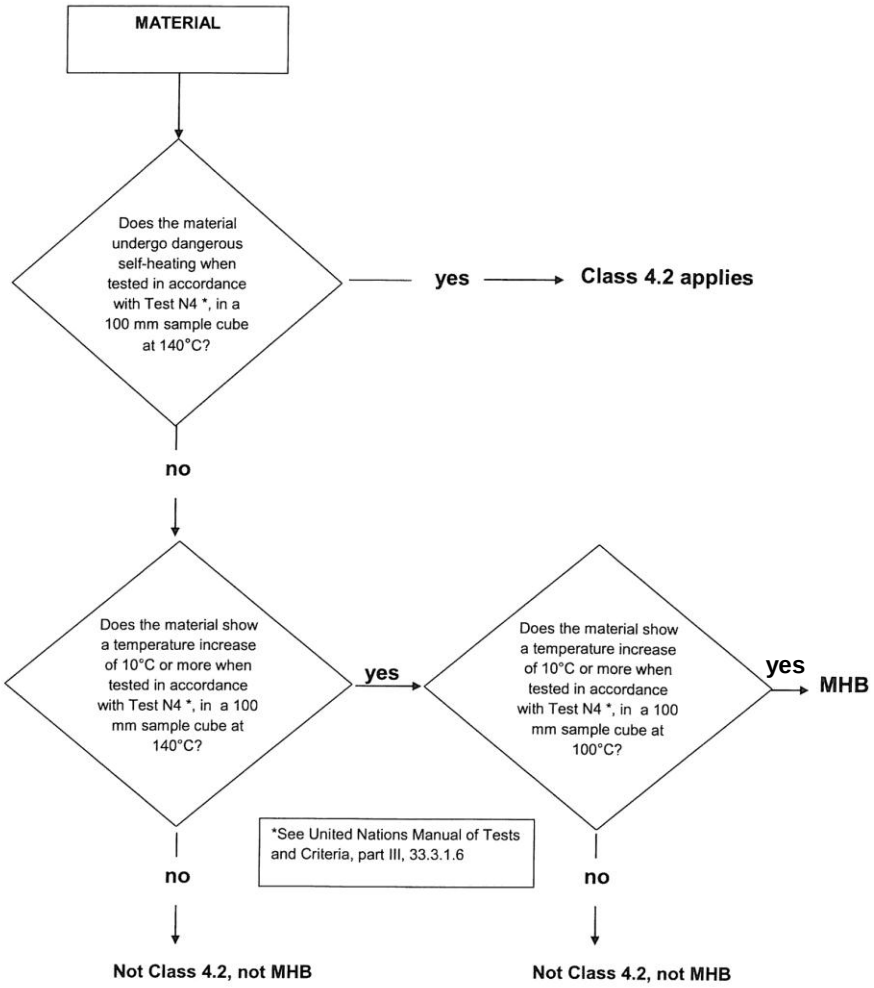
9.2.3.2.2 Powdered, granular or pasty materials shall be classified as MHB when the time of burning of one or more of the test runs, performed in accordance with the preliminary screening test method described in the United Nations Manual of Tests and Criteria, part III, 33.2.1.4.3.1, is less than 2 minutes. Powders of metals or metal alloys shall be classified as MHB when they can be ignited and the reaction spreads over the whole length of the sample in 20 minutes or less. The test sample in the preliminary screening test is 200 mm in length. A summary of this approach is presented in the table below:

Solid Cargo	**Hazard Class 4.1, PG III Burn time, Burn distance**	**MHB Burn time, Burn distance**
Powdered Metal	more than 5 minutes but not more than 10 minutes, 250 mm	≤20 minutes, 200 mm
Solid Material	<45 seconds, 100 mm	≤2 minutes, 200 mm

9.2.3.3 Self-heating solids

9.2.3.3.1 These are materials that self-heat when transported in bulk and do not meet the established criteria for inclusion in class 4.2 (see 9.2.2.2).

9.2.3.3.2 A material shall be classified as MHB if, in the tests performed in accordance with the test method given in the United Nations Manual of Tests and Criteria, part III, 33.3.1.6, the temperature of the test sample rises by more than 10°C when using a 100 mm cube sample at 140°C and at 100°C. The flow chart below illustrates the test procedure.



9.2.3.3.3 In addition, a material shall be classified as MHB if a temperature rise of 10°C or more over ambient temperature is observed during any portion of the test performed in accordance with the test method described in United Nations Manual of Tests and Criteria, part III, 33.4.1.4.3.5. When performing this test, the temperature of the sample should be measured continuously over 48 hours. If, at the end of the 48-hour period the temperature is increasing, the test period shall be extended in accordance with the test method.

9.2.3.4 Solids that evolve into flammable gas when wet

9.2.3.4.1 These are materials that emit flammable gases when in contact with water when transported in bulk and do not meet established criteria for inclusion in class 4.3 (see 9.2.2.3).

9.2.3.4.2 A material shall be classified as MHB if, in tests performed in accordance with the test method given in the United Nations Manual of Tests and Criteria, part III, 33.4.1, the flammable gas evolution rate is greater than zero. When performing this test, the rate of evolution of gas shall be calculated over 48 hours at one-hour intervals. If at the end of the 48-hour period the rate of evolution is increasing, the test period shall be extended in accordance with the test method.

9.2.3.5 Solids that evolve toxic gas when wet

9.2.3.5.1 These are materials that emit toxic gases when in contact with water when transported in bulk.

9.2.3.5.2 A material shall be classified as MHB if, in tests performed in accordance with the test method given in the United Nations Manual of Tests and Criteria, part III, 33.4.1, the toxic gas evolution rate is greater than zero. Toxic gas evolution shall be measured using the same test procedure for flammable gas evolution as prescribed in the test method. When performing this test, the rate of evolution of gas shall be calculated over 48 hours at 1-hour intervals. If at the end of the 48-hour period the rate of evolution is increasing, the test period shall be extended in accordance with the test method.

9.2.3.5.3 The gas shall be collected over the test period prescribed above. The gas shall be chemically analysed and tested for toxicity if the gas is unknown and no acute inhalation toxicity data is available. If the gas is known, inhalation toxicity shall be assessed based on all information available, using testing as a last resort option for concluding this hazard. Toxic gases in this respect are gases showing acute inhalation toxicity (LC_{50}) of or below 20,000 ppmV or 20 mg/l by 4 hours' testing (GHS Acute Toxicity Gases/Vapours Category 4).

9.2.3.6 Toxic solids

9.2.3.6.1 These are materials that have toxic hazards to humans if inhaled or with contact with skin when loaded, unloaded, or transported in bulk and do not meet the established criteria for inclusion in class 6.1 (see 9.2.2.5).

9.2.3.6.2 A material shall be classified as MHB in accordance with the criteria laid down within part 3 of the GHS:

.1 cargoes developing cargo dust with an acute inhalation toxicity (LC_{50}) of 1-5 mg/l by 4 hours testing (GHS Acute Toxicity Dusts Category 4);

.2 cargoes developing cargo dust exhibiting an inhalation toxicity of equal to or less than 1 mg/litre/4h (GHS Specific Target Organ Toxicity Single Exposure Inhalation Dust Category 1) or below 0.02 mg/litre/6h/d (GHS Specific Target Organ Toxicity Repeated Dose Inhalation Dust Category 1);

.3 cargoes exhibiting an acute dermal toxicity (LD_{50}) of 1,000-2,000 mg/kg (GHS Acute Toxicity Dermal Category 4);

.4 cargoes exhibiting a dermal toxicity of or below 1000 mg (GHS Specific Target Organ Toxicity Single Exposure Dermal Category 1) or below 20 mg/kg bw/d by 90 days testing (GHS Specific Target Organ Toxicity Repeated Dose Dermal Category 1);

.5 cargoes exhibiting carcinogenicity (GHS Category 1A and 1B), mutagenicity (GHS Category 1A and 1B) or reprotoxicity (GHS Category 1A and 1B).

9.2.3.7 Corrosive solids

9.2.3.7.1 These are materials that are corrosive to skin, eye or to metal or are respiratory sensitizers and do not meet the established criteria for inclusion in class 8 (see 9.2.2.7).

9.2.3.7.2 A material shall be classified as MHB in accordance with the criteria laid down within part 3 of the GHS:

.1 cargoes which are known to be a respiratory sensitizer (GHS Respiratory Sensitization Category 1);

.2 cargoes exhibiting skin irritation with a mean value of or higher than 2.3 for erythema/eschar or oedema (GHS Skin Corrosion/Irritation Category 2);

.3 cargoes exhibiting eye irritation with a mean value of or higher than 1 for corneal opacity/irititis or 2 for conjunctival redness/oedema (GHS Serious Eye Damage Category 1 or Eye Irritation Category 2A).

9.2.3.7.3 A material shall be classified as MHB when the corrosion rate on either steel or aluminium surfaces is between 4 mm and 6.25 mm a year at a test temperature of 55°C when tested on both materials. For the purposes of testing steel, type S235JR+CR (1.0037 resp. St 37-2), S275J2G3+CR (1.0144 resp. St 44-3), ISO 3574:199, Unified Numbering Systems (UNS) G10200 or SAE 1020, and for testing aluminium, non-clad, types 7075-T6 or AZ5GU T6 shall be used. An acceptable test is prescribed in the United Nations Manual of Tests and Criteria, part III, section 37. When this test is performed the sample shall contain at least 10% moisture by mass. If the representative sample of the cargo to be shipped does not contain more than 10% moisture by mass, water shall be added to the sample."

Appendix 1 – Individual schedules of solid bulk cargoes

AMMONIUM NITRATE UN 1942
with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance

21 In the section for Stowage and Segregation replace the sentence "There shall be no sources of heat or ignition in the cargo space." with the sentence "Separated from" sources of heat or ignition (*see also* **Loading**)."

22 In the section for Loading, insert as the first sentence the following:

"This cargo shall not be loaded in cargo spaces adjacent to fuel oil tank(s), unless heating arrangements for the tank(s) are disconnected and remain disconnected during the entire voyage."

AMMONIUM NITRATE-BASED FERTILIZER UN 2067

23 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

"Ammonium nitrate-based fertilizers classified as UN 2067 are uniform mixtures containing ammonium nitrate as the main ingredient within the following composition limits:

.1 not less than 90% ammonium nitrate with not more than 0.2% total combustible/organic material calculated as carbon and with added matter, if any, which is inorganic and inert towards ammonium nitrate; or

.2 less than 90% but more than 70% ammonium nitrate with other inorganic materials or more than 80% but less than 90% ammonium nitrate mixed with calcium carbonate and/or dolomite and/or mineral calcium sulphate and not more than 0.4% total combustible/organic material calculated as carbon; or

.3 ammonium nitrate-based fertilizers containing mixtures of ammonium nitrate and ammonium sulphate with more than 45% but less than 70% ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon such that the sum of the percentage compositions of ammonium nitrate and ammonium sulphate exceeds 70%."

24 In the section for Stowage and Segregation, the text "Not to be stowed immediately adjacent to any tank, double bottom or pipe containing fuel oil heated to more than 50°C" is replaced with the following:

"Not to be stowed immediately adjacent to any tank, double bottom or pipe containing heated fuel oil unless there are means to monitor and control the temperature so that it does not exceed 50°C."

AMMONIUM NITRATE-BASED FERTILIZER UN 2071

25 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

"Ammonium nitrate-based fertilizers classified as UN 2071 are uniform ammonium nitrate based fertilizer mixtures of the nitrogen, phosphate or potash, containing not more than 70% ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon or with not more than 45% ammonium nitrate and unrestricted combustible material. Fertilizers within these composition limits are not subject to the provisions of this schedule when shown by a trough test* that they are not liable to self-sustaining decomposition.

* See UN Manual of Tests and Criteria, part III, subsection 38.2."

26 In the section for Stowage and Segregation, the text "Not to be stowed immediately adjacent to any tank or double bottom containing fuel oil heated to more than 50°C" is replaced with the following:

> "Not to be stowed immediately adjacent to any tank, double bottom or pipe containing heated fuel oil unless there are means to monitor and control the temperature so that it does not exceed 50°C."

AMMONIUM NITRATE-BASED FERTILIZER (non-hazardous)

27 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

> "Ammonium nitrate based fertilizers transported in conditions mentioned in this schedule are uniform mixtures containing ammonium nitrate as the main ingredient within the following composition limits:
>
> .1 not more than 70% ammonium nitrate with other inorganic materials;
>
> .2 not more than 80% ammonium nitrate mixed with calcium carbonate and/or dolomite and/or mineral calcium sulphate and not more than 0.4% total combustible organic material calculated as carbon;
>
> .3 nitrogen type ammonium nitrate based fertilizers containing mixtures of ammonium nitrate and ammonium sulphate with not more than 45% ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon; and
>
> .4 uniform ammonium nitrate based fertilizer mixtures of nitrogen, phosphate or potash, containing not more than 70 % ammonium nitrate and not more than 0.4% total combustible organic material calculated as carbon or with not more than 45% ammonium nitrate and unrestricted combustible material. Fertilizers within these composition limits are not subject to the provisions of this schedule when shown by a trough test* that they are liable to self-sustaining decomposition or if they contain an excess of nitrate greater than 10% by mass."

and its corresponding footnote is amended as follows:

"* See UN Manual of Tests and Criteria, part III, subsection 38.2."

28 In the section Stowage and Segregation the text "Not to be stowed immediately adjacent to any tank, double bottom or pipe containing fuel oil heated to more than 50°C" is replaced with the following:

> "Not to be stowed immediately adjacent to any tank, double bottom or pipe containing heated fuel oil unless there are means to monitor and control the temperature so that it does not exceed 50°C."

CALCIUM NITRATE UN 1454

29 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

> "The provisions of this Code shall not apply to the commercial grades of calcium nitrate fertilizers consisting mainly of a double salt (calcium nitrate and ammonium nitrate) and containing not more than 10% ammonium nitrate and at least 12% water of crystallization."

CALCIUM NITRATE FERTILIZER

30 The following text is inserted under the Bulk Cargo Shipping Name:

> "The provisions of this schedule shall apply only for cargoes containing not more than 15.5% total nitrogen and at least 12% water."

31 The following text is deleted from the section for Description:

> "and containing not more than 15.5% total nitrogen and at least 12% water".

CHARCOAL

32 The following text contained in the section for Hazard, is moved at the end in the section for Loading:

> "Hot charcoal screenings in excess of 55°C shall not be loaded."

FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS UN 2793

33 The following text contained in the section for Description is moved under the Bulk Cargo Shipping Name:

> "This schedule shall not apply to consignments of materials which are accompanied by a declaration submitted prior to loading by the shipper and stating that they have no self-heating properties when transported in bulk."

METAL SULPHIDE CONCENTRATES

34 The following text contained in the section for Hazard, is moved at the end in the section for Precautions:

> "When a Metal Sulphide Concentrate is considered as presenting a low fire-risk, the carriage of such cargo on a ship not fitted with a fixed gas fire extinguishing system shall be subject to the Administration's authorization as provided by SOLAS regulation II-2/10.7.1.4."

PEAT MOSS

35 The following text contained in the section for Hazard, is moved at the end in the section for Loading:

> "Peat Moss having a moisture content of more than 80% by weight shall only be carried on specially fitted or constructed ships (see paragraph 7.3.2 of this Code)."

SAND

36 The following text is inserted under the Bulk Cargo Shipping Name:

"Sands included in this schedule are:

Foundry sand	Silica sand
Potassium felspar sand	Soda felspar sand"
Quartz sand	

37 The following text in the section for Description is deleted:

"Sands included in this schedule are:

FOUNDRY SAND	SILICA SAND
POTASSIUM FELSPAR SAND	SODA FELSPAR SAND"
QUARTZ SAND	

SEED CAKE
containing vegetable oil UN 1386(b) solvent extractions and expelled seeds, containing not more than 10% of oil and when the amount of moisture is higher than 10%, not more than 20% of oil and moisture combined.

38 The following text is inserted under the Bulk Cargo Shipping Name:

"The provisions of this schedule shall not apply to:

.1 solvent extracted rape seed meal, soya bean meal, cotton seed meal and sunflower seed meal, containing not more than 4% oil and 15% oil and moisture combined and being substantially free from flammable solvents;

.2 mechanically expelled citrus pulp pellets containing not more than 2.5% oil and 14% oil and moisture combined;

.3 mechanically expelled corn gluten meal containing not more than 11.0% oil and 23.6% oil and moisture combined;

.4 mechanically expelled corn gluten feed pellets containing not more than 5.2% oil and 17.8% oil and moisture combined; and

.5 mechanically expelled beet pulp pellets containing not more than 2.8% oil and 15.0% oil and moisture combined.

A certificate from a person recognized by the competent authority of the country of shipment shall be provided by the shipper, prior to loading, stating that the provisions of the exemption are met."

39 In the section for Description, the following paragraph is deleted:

"The provisions of this schedule should not apply to solvent extracted rape seed meal, pellets, soya bean meal, cotton seed meal and sunflower seed meal, containing not more than 4% oil and 15% oil and moisture combined and being substantially free from flammable solvents. The provisions of this schedule also apply to mechanically expelled citrus pulp pellets containing not more that 2.5% oil and 14% oil and moisture combined. A certificate from a person recognized by the competent authority of the country of shipment should be provided by the shipper, prior to loading, stating that the provisions of the exemption are met."

SEED CAKE (non-hazardous)

40 The following text is inserted under the Bulk Cargo Shipping Name:

"The provisions of this schedule shall only apply to:

.1 solvent extracted rape seed meal, soya bean meal, cotton seed meal and sunflower seed meal, containing not more than 4% oil and 15% oil and moisture combined and being substantially free from flammable solvents;

.2 mechanically expelled citrus pulp pellets containing not more than 2.5% oil and 14% oil and moisture combined;

.3 mechanically expelled corn gluten meal containing not more than 11.0% oil and 23.6% oil and moisture combined;

.4 mechanically expelled corn gluten feed pellets containing not more than 5.2% oil and 17.8% oil and moisture combined; and

.5 mechanically expelled beet pulp pellets containing not more than 2.8% oil and 15.0% oil and moisture combined."

41 In the section for Description, the following text is deleted:

"The provisions of this schedule apply to solvent extracted rape seed meal, pellets, soya bean meal, cotton seed meal and sunflower seed meal, containing not more than 4% oil and 15% oil and moisture combined and being substantially free from flammable solvents. The provisions of this schedule also apply to mechanically expelled citrus pulp pellets containing not more than 2.5% oil and 14% oil and moisture combined."

and the following text contained in the section for Description, is moved at the end of the section for Loading:

"A certificate from a person recognized by the competent authority of the country of shipment shall be provided by the shipper, prior to loading, stating that the requirements for exemption as set out either in the schedule for seed cake UN 1386 (b) or UN 2217, whichever is applicable, are met."

SILICOMANGANESE (low carbon)
with known hazard profile or known to evolve gases with silicon content of 25% or more

42 In the Bulk Cargo Shipping Name, delete the words "**with known hazard profile or known to evolve gases with silicon content of 25% or more**".

43 Replace the existing text under the section for Description, with the following:

"A ferroalloy comprising principally manganese and silicon, mainly used as a deoxidizer and alloying element in the steel-making process. Particle or lump of blackish brown, silver white metal."

44 The existing table of Characteristics is replaced with the following:

"

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	3,000 to 3,300	0.30 to 0.33
Size	**Class**	**Group**
10 mm to 150 mm	MHB	B

"

45 Replace the existing text under the section for Hazard, with the following:

"This cargo is non-combustible and has a low fire-risk. However, in contact with water this cargo may evolve hydrogen, a flammable gas that may form explosive mixtures with air and may, under similar conditions, produce phosphine and arsine, which are highly-toxic gases. This cargo is liable to reduce oxygen content in a cargo space. May cause long-term health effect."

46 In the section for Precautions, the following text is deleted:

"Prohibition of smoking in dangerous areas shall be enforced, and clearly legible "NO SMOKING" signs shall be displayed. Electrical fittings and cables shall be in good condition and properly safeguarded against short circuits and sparking. Where a bulkhead is required to be suitable for segregation purposes, cable and conduit penetrations of the decks and bulkheads shall be sealed against the passage of gas and vapour. Ventilation systems shall be shut down or screened and air condition systems, if any, placed on recirculation during loading or discharge, in order to minimize the entry of dust into living quarters or other interior spaces of the ship. Precautions shall be taken to minimize the extent to which dust may come in contact with moving parts of deck machinery and external navigation aids (e.g. navigation lights)."

SULPHUR (formed, solid)

47 The following text contained in the section for Description, is moved under the Bulk Cargo Shipping Name:

"This schedule shall not apply to crushed, lump and coarse-grained sulphur (see SULPHUR UN 1350), or to co-products from sour gas processing or oil refinery operations NOT subjected to the above-described forming process."

48 Insert the following new individual schedules accordingly in alphabetical order:

"**ALUMINA HYDRATE**

Description
Alumina hydrate is a fine, moist, white (light coloured), odourless powder. Insoluble in water and organic liquids.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	500 to 1,500	0.67 to 2.0
Size	**Class**	**Group**
Fine powder	MHB	A and B

Hazard
This cargo may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of the Code. Alumina Hydrate dust is very abrasive and penetrating. Irritating to eyes, skin and mucous membranes. This cargo is non-combustible or has low fire-risks.

Stowage and segregation
Separated from oxidizing materials.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure it is working. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Due consideration shall be paid to protect equipment from the dust of the cargo. Persons who may be exposed to the dust of the cargo shall wear goggles or other equivalent dust eye-protection and dust filter masks. Those persons shall wear protective clothing, as necessary.

Ventilation
No special requirements.

Carriage
The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
The water used for the cleaning of the cargo spaces, after discharge of this cargo, shall not be pumped by the fixed bilge pumps. A portable pump shall be used, as necessary, to clear the cargo spaces of the water.

Emergency procedures

Special emergency equipment to be carried Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus.
Emergency procedures Wear protective clothing and self-contained breathing apparatus **Emergency action in the event of fire** Nil (non-combustible) **Medical First Aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"**ALUMINIUM SMELTING / REMELTING BY-PRODUCTS, PROCESSED**

The provisions of this schedule shall not apply to ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS UN 3170.

Description
Product obtained by treating the by-products of merging/recasting of aluminium with water and/or alkalis solutions to render the material less reactive with water. A damp powder with a slight smell of ammonia.

Characteristics

Angle of repose	Bulk density (kg/ m^3)	Stowage factor (m^3/t)
Not applicable	1,080 to 1,750	0.57 to 0.93
Size	**Class**	**Group**
Less than 1 mm	MHB	A and B

Hazard
This cargo may develop small amount of hydrogen, a flammable gas which may form explosive mixtures with air, and of ammonia, which is a highly toxic gas.
This cargo may liquefy if shipped at moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of the Code. Corrosive to eyes.

Stowage and segregation
"Separated from" foodstuffs and all Class 8 liquids. Segregation as for Class 4.3 materials.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
This cargo shall be kept as dry as practicable and the moisture content shall be kept less than its TML during loading operations and the voyage. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which this cargo is loaded or to be loaded shall be closed.

Loading
Trim in accordance with the relevant provisions of sections 4 and 5 of this Code.

Precautions
Persons who may be exposed to the cargo shall wear personal protective equipment, including goggles and/or skin protection as necessary. Prior to loading this cargo, a weathering certificate shall be provided by the manufacturer or shipper stating that, after manufacture, the material was stored under cover, but exposed to the weather in the particle size to be shipped, for not less than four weeks prior to shipment. Whilst the ship is alongside and the hatches of the cargo spaces containing this cargo are closed, the mechanical ventilation shall be operated continuously as weather permits. During handling of this cargo, "NO SMOKING" signs shall be posted on decks and in areas adjacent to cargo spaces and no naked lights shall be permitted in these areas. Bulkheads between the cargo spaces and the engine-room shall be gastight. Inadvertent pumping through machinery spaces shall be avoided. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

Ventilation
Continuous mechanical ventilation shall be conducted during the voyage for the cargo spaces carrying this cargo. If maintaining ventilation endangers the ship or the cargo, it may be interrupted unless there is a risk of explosion or other danger due to interruption of the ventilation. In any case, mechanical ventilation shall be maintained for a reasonable period prior to discharge. Ventilation shall be arranged such that any escaping gases are minimized from reaching living quarters on or under the deck.

Carriage
For quantitative measurements of hydrogen, ammonia and acetylene, suitable detectors for each gas or combination of gases shall be on board while this cargo is carried. The detectors shall be of certified safe type for use in explosive atmosphere. The concentrations of these gases in the cargo spaces carrying this cargo shall be measured regularly, during voyage, and the results of the measurements shall be recorded and kept on board. The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge. Hatches of the cargo spaces carrying this cargo shall be weathertight to prevent the ingress of water.

Discharge
No special requirements.

Clean-up
Persons who may be exposed to the cargo shall wear personal protective equipment including goggles and/or skin protection as necessary. After discharge of this cargo, the bilge wells and scuppers of the cargo spaces shall be checked and any blockage shall be removed.

Prior to using water for hold cleaning, holds should be swept to remove as much cargo residues as practicable.

Emergency procedures

Special emergency equipment to be carried
Nil
Emergency procedures
Nil
Emergency action in the event of fire
Batten down and use CO_2 if fitted
Medical first aid
Refer to the Medical First Aid Guide (MFAG), as amended

"

"**CLINKER ASH, WET**

Description
Coal ash discharged from coal-fired power stations. Grey-coloured, possibly ranging from near-white to near-black, and odourless substance collected from the bottom of boilers, and resembles sand. Moisture content is about 15% to 23%. Insoluble in water.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	600 to 1,700	0.6 to 1.7
Size	**Class**	**Group**
Up to 90 mm	MHB	A and B

Hazard
The material may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of the Code. May cause long-term health effects. This cargo is non-combustible or has a low fire-risk.

Stowage and Segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
This cargo shall be kept as dry as practicable before loading, during loading and while on the voyage. When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
Persons who may be exposed to the dust of the cargo shall wear gloves, goggles or other equivalent dust eye-protection and dust filter masks.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-Up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Protective clothing (goggles, dust filter masks, gloves, coveralls).
Emergency procedures Wear protective clothing. **Emergency action in the event of fire** Nil (non-combustible) **Medical First Aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"**COAL TAR PITCH**

Description
A coarse distilled residue of Coal Tar, a by-product of Cokes production. Mostly comprises many kinds of polycyclic aromatic hydrocarbon. A black solid at ambient temperature. It is insoluble in water. A raw material in use for electrodes and materials covering pitch bound on metallurgy coke. The moisture content is up to 6%.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	600 to 1,100	0.9 to 1.7
Size	**Class**	**Group**
Up to 100mm 0 to 10% of fine particles: less than 1 mm	MHB	B

Hazard
This cargo is non-combustible or has a low fire-risk. When heated, it melts and turns into inflammable liquid. It softens between 70°C and 120°C. Corrosive to eyes. May cause long-term health effects.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
Persons who may be in contact with this cargo shall be supplied with protective gloves, dust masks, protective clothing and goggles.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Protective clothing (gloves, boots, overalls, headgear, dust masks and goggles).
Emergency procedures Wear protective clothing, protective gloves, dust masks and goggles. **Emergency action in the event of fire** Batten down: use ship's fixed fire-fighting installation if fitted. Exclusion of air may be sufficient to control fire. **Medical first aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"**COARSE IRON AND STEEL SLAG AND ITS MIXTURE**

Description

A coarse slag arising from iron and steel manufacture, and a coarse slag mixed with one of the following substances or a combination thereof: concrete debris, fly-ash, firebricks, dust collected from iron/steel-making processes, refractory material debris and fine raw materials of iron making.

This cargo includes shaped blocks made of iron and steel slag with one of the additives or a combination of additives: cement, ground granulated blast furnace slag and fly-ash, and its debris, and their mixture with iron and steel slag.

The colour is in the range from greyish-white to dark grey, and the appearance is in the range from granulated, pebble to block shaped.

Characteristics

Angle of repose	**Bulk density (kg/m^3)**	**Stowage factor (m^3/t)**
Not applicable	1,200 to 3,000	0.33 to 0.83
Size	**Class**	**Group**
90 to 100% of lumps: up to 300 mm 0 to 10% fine particles: less than 1 mm	Not applicable	C

Hazard
No special requirements.
This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

When the stowage factor of this cargo is equal or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.

Precautions
Persons who may be exposed to the dust of the cargo shall wear goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**CRUSHED CARBON ANODES**

Description
Crushed Carbon Anodes are spent carbon anodes that are crushed into smaller pieces to permit their shipment for recycling. Carbon anodes are used to introduce electricity into the aluminium smelter pots. This cargo is mainly composed of black crushed lumps and pieces principally containing carbon and other impurities. The material is odourless.

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	800 to 1,000	1.00 to 1.25
Size	**Class**	**Group**
Mainly coarse pieces up to 60 cm +	Not applicable	C

Hazard
This cargo may generate dust. This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection, dust filter mask and barrier creams as necessary.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**GRAIN SCREENING PELLETS**

The provision of this schedule shall apply only to Grain Screening Pellets material containing not more than 6.2% oil content and not more than 17.5% oil and moisture content combined.

Description
Grain Screening Pellets are animal feed products, pelletized animal feed derived from dockage removed from grains. Screenings means dockage that has been removed from grain that does not qualify for any other grain grades. Depending

upon their quality, screenings vary in level of parent and volunteer grain material, broken or shrunken kernels, hulls, weed seeds, chaff, dust and other plant material. The colour ranges from brown to yellow.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
less than 30°	478 to 719	1.39 to 2.09
Size	**Class**	**Group**
Length: 12 to 38 mm Diameter: 4 to 7 mm	Not applicable	C

Hazard
This cargo flows freely like grain. This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed.

Loading
Trim in accordance with the relevant provisions required under sections 4, 5 and 6 of the Code in accordance with the shipper's declaration of the angle of repose.

A certificate from a person recognized by the competent authority of the country of shipment shall be provided by the shipper to the master, prior to loading, confirming that the oil and the moisture contents as described in the schedule have been met.

Precautions
Persons who may be exposed to the dust of the cargo shall wear a dust filter mask, protective eyewear, and protective clothing as necessary.

Carriage
Hatches of the cargo spaces shall be weather tight to prevent water ingress.

Discharge
No special requirements.

Ventilation
No special requirements.

Clean-up
No special requirements.

Emergency Procedures
No special requirements."

"**GRANULATED NICKEL MATTE (LESS THAN 2% MOISTURE CONTENT)**

Description
Crude dark grey nickel product composed of about 55% nickel, 20% copper and 25% other mineral impurities. The material is odourless.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	2,800 to 4,000	0.25 to 0.36
Size	**Class**	**Group**
Up to 3 mm	MHB	B

Hazard
Contact with the skin may give rise to irritation.
This cargo is non-combustible or has a low fire-risk.
This cargo is moderately toxic by inhalation.

Stowage and segregation
Separated from foodstuffs.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading process by a pile of the cargo.

Precautions
Persons who may be exposed to the dust component of the cargo shall wear personal protective equipment including goggles or other equivalent dust eye-protection, respiratory protection, and/or skin protection as necessary. Due consideration shall be paid to prevent dust entering living quarters and enclosed working area. Eating and drinking is prohibited in the cargo work areas. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo.

Carriage
No special requirements.

Discharge
No special requirements.

Ventilation
No special requirements.

Clean-up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Protective clothing (gloves, boots, coveralls) Self-contained breathing apparatus
Emergency procedures Wear protective clothing and self-contained breathing apparatus. **Emergency action in the event of fire** Nil (non-combustible) **Medical First Aid** Refer to the *Medical First Aid Guide (MFAG)*, as amended.

"

"**GYPSUM GRANULATED**

Description
Gypsum Granulated made from calcium sulphate hydrate which is produced artificially or industrial by-product. It is produced by granulating and processing such calcium sulphate hydrate until its grain size becomes 10 mm diameter or more. Insoluble in water.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	310 to 1,200	0.83 to 3.23
Size	**Class**	**Group**
Greater than 10 mm	Not applicable	C

Hazard
No special hazards.
This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
No special requirements.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**ILMENITE (ROCK)**

Description
Ilmenite (Rock) is obtained from mine blasting followed by crushing. It has a black colour. It may be smelted in electric arc furnaces or can be used in blast furnaces.

Characteristics

Angle of repose	**Bulk density (kg/m^3)**	**Stowage factor (m^3/t)**
Not applicable	2,400 to 3,200	0.31 to 0.42
Size	**Class**	**Group**
Up to 100 mm	Not applicable	C

Hazard
This cargo has no special hazards.
This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.

Precautions
Avoid breathing dust. Persons who may be exposed to the dust of the cargo shall wear a dust filter mask, protective eyewear and clothing as necessary.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**ILMENITE (UPGRADED)**

Description
Ilmenite (upgraded), is obtained from the smelting of rock or sand Ilmenite into electric arc furnaces. Ilmenite (upgraded) has a granular form and its colour varies from black (normal grades) to brown-orange for its purified grade.

Ilmenite (upgraded) is also known as Titanium slag, Titanium Ore Concentrate, Chloride Slag, Sulphate Slag, High Grade Sulphate Slag, Slag fines, Slag ilmenite electro thermal smelting or TiO_2 slag.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	1,860 to 2,400	0.41 to 0.54
Size	**Class**	**Group**
Up to 12 mm	Not applicable	A

Hazard
This material may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.

This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
This cargo shall be kept as dry as practicable before loading, during loading and while on the voyage. When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.

Precautions
Bilge wells shall be clean, dry and covered as appropriate to prevent ingress of the cargo. Avoid breathing dust. Persons who may be exposed to the dust component of the cargo shall wear personal protective equipment including goggles or other equivalent dust eye-protection and respiratory protection as necessary. Wash hands and face before eating, drinking or smoking.

Ventilation
No special requirements.

Carriage
The appearance of the cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
No special requirements."

"**NICKEL ORE**

Description
Nickel ore varies in colour. There are several types of ore of variable particle size and moisture content. Some may contain clay-like ores. For concentrates, see NICKEL CONCENTRATE.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	1,400 to 1,800	0.55 to 0.71
Size	**Class**	**Group**
Various	Not applicable	A

Hazard
This material may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
Cargo spaces must be clean and dry.

Weather precautions
When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 all measures shall be taken during loading operations and the voyage to avoid an increase in the moisture content of the cargo;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

When the stowage factor of this cargo is equal or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.

Precautions
Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. The bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure that it is working.

Ventilation
The cargo spaces carrying this cargo shall not be ventilated during voyage.

Carriage
The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
No special requirements."

"**SAND, HEAVY MINERAL**

Description
The cargo is generally a blend of two or more heavy mineral sands. Such sands are characterized by their heavy bulk density and relatively fine grain size.
Abrasive. May be dusty.

Characteristics

Angle of repose	**Bulk density (kg/m^3)**	**Stowage factor (m^3/t)**
Not applicable	2,380 to 3,225	0.31 to 0.42
Size	**Class**	**Group**
Up to 5 mm	Not applicable	A

Hazard
This cargo may liquefy if shipped at a moisture content in excess of its TML. See sections 7 and 8 of this Code.

This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
When a cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that tank top is not overstressed during voyage and during loading by a pile of the cargo.

Precautions
Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

Ventilation
No special requirements.

Carriage
The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
No special requirements."

"**SILICON SLAG**

Description
Silicon slag is an odourless greyish metallic material mainly in lump. It is composed of silicon and silicon dioxide in variable proportions.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	2,300 to 3,000	0.33 to 0.43
Size	**Class**	**Group**
Up to 150 mm	Not applicable	C

Hazard
The dust may cause irritation of eyes, skin and upper respiratory tract.
This cargo is non-combustible or has a low fire-risk.

Stowage and segregation
"Separated from" acids or base materials.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during the voyage and during the loading process by a pile of the cargo.

Precautions
Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter mask as necessary.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**SOLIDIFIED FUELS RECYCLED FROM PAPER AND PLASTICS**

This schedule shall not apply to material classified as dangerous goods (Class 4.2).

Description
Solidified fuels comprising papers and plastics by compressing or extruding in moulds. The main raw materials of this cargo are waste paper and plastic. Moisture content is 5% or less. Ash content is 10% or less. Total chlorine is 0.3% or less.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
Not applicable	400 to 500	2.0 to 2.5
Size	**Class**	**Group**
Length: 30 to 100 mm Diameter: 15 to 30 mm	MHB	B

Hazard
Spontaneous ignition is not liable to occur up to 200°C. When ignited, it burns violently. When melted, it generates flammable and toxic gases. Spontaneous-heating may take place and may deplete oxygen in the cargo spaces.

Stowage and segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Prior to loading, the manufacturer or shipper shall give the master a certificate stating that the cargo is not class 4.2. Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

Precautions
During handling and carriage, no hot work, burning and smoking shall be permitted in the vicinity of the cargo spaces containing this cargo. After discharging this cargo, entry into cargo spaces shall not be permitted unless they have been sufficiently ventilated.

Ventilation
The hatches of the cargo spaces shall be closed and the spaces shall not be ventilated during voyage.

Carriage
Entry into the cargo spaces shall not be permitted during voyage.

Discharge
The hatches of the cargo spaces shall be opened and sufficiently ventilated prior to entry.

Clean-up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Protective clothing (protective glasses, heat-resistant gloves, coveralls).
Emergency procedures Wear protective clothing. **Emergency action in the event of fire** Batten down; use ship's fixed fire-fighting installation, if fitted. Extinguish fire with water, foam or dry chemicals. **Medical First Aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"WOOD TORREFIED

Description
Wood torrefied is wood that has been partially burned or roasted and formed into pellets or briquettes. Chocolate brown or black in colour. May contain up to 3% binder.

Characteristics

Angle of repose	Bulk density (kg/m^3)	Stowage factor (m^3/t)
35° or less	650 to 800	1.25 to 1.54
Size	**Class**	**Group**
Pellets with a diameter of 6 to 12 mm. Briquettes with a thickness of 12 to 50 mm and a length and width up to 75 mm.	MHB	B

Hazard
Shipments may be subject to oxidation leading to depletion of oxygen and increase of carbon monoxide and carbon dioxide in cargo and adjacent spaces.

Wood torrefied is readily combustible and may self-heat and spontaneously combust.

Handling of wood torrefied may cause dust to develop with a subsequent risk of dust explosion when loading. Dust may cause eye, skin and respiratory irritation.

Stowage and segregation
Segregation as for class 4.1 materials.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which this cargo is loaded or to be loaded shall be closed.

Loading
Trim in accordance with the relevant provisions required under sections 4, 5 and 6 of the Code.

Precautions
Entry of personnel into cargo and adjacent confined spaces shall not be permitted until tests have been carried out and it has been established that the oxygen content and carbon monoxide levels have been restored to the following levels: oxygen 20.7% and carbon monoxide <100 ppm. If these conditions are not met, additional ventilation shall be applied to the cargo hold or adjacent confined spaces and remeasuring shall be conducted after a suitable interval. An oxygen and carbon monoxide meter shall be worn and activated by all crew when entering cargo and adjacent enclosed spaces.

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

Ventilation
Ventilation of enclosed spaces adjacent to a cargo hold before entry may be necessary even if these spaces are apparently sealed from the cargo hold.

Carriage
Hatches of the cargo spaces carrying this cargo shall be weathertight to prevent the ingress of water.

Discharge
No special requirements.

Clean-up
No special requirements.

Emergency procedures

Special emergency equipment to be carried Self-contained breathing apparatus and combined or individual oxygen and carbon monoxide meters should be available.
Emergency procedures Nil **Emergency action in the event of fire** Batten down; use ship's fixed fire-fighting installation, if fitted. Exclusion of air may be sufficient to control fire. Extinguish fire with carbon dioxide, foam or water. **Medical First Aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

Appendix 3 – Properties of solid bulk cargoes

1 Non-cohesive cargoes

49 In paragraph 1.1, the new following Bulk Cargo Shipping Names are inserted in alphabetical order:

"GRAIN SCREENING PELLETS"
"WOOD TORREFIED"

Appendix 4 – Index

50 Include in ALUMINA HYDRATE a synonym as:

"Aluminium hydroxide"

51 Insert an additional name under SAND as:

"

Material	Group	References
Spodumene	C	*see* SAND

"

52 In the line for SILICOMANGANESE in the line for Material, amend the Bulk Shipping Name to read "SILICOMANGANESE (low carbon)".

53 Include the following names in the alphabetical index:

"

Material	Group	References
ALUMINA HYDRATE	A and B	
ALUMINIUM SMELTING / REMELTING BY-PRODUCTS, PROCESSED	A and B	
CLINKER ASH, WET	A and B	
COAL TAR PITCH	B	
COARSE IRON AND STEEL SLAG AND ITS MIXTURE	C	
CRUSHED CARBON ANODES	C	
GRAIN SCREENING PELLETS	C	
GRANULATED NICKEL MATTE (LESS THAN 2% MOISTURE CONTENT)	B	
GYPSUM GRANULATED	C	
ILMENITE (ROCK)	C	
ILMENITE (UPGRADED)	A	
NICKEL ORE	A	
SAND, HEAVY MINERAL	A	
SILICON SLAG	C	
SOLIDIFIED FUELS RECYCLED FROM PAPER AND PLASTICS	B	
WOOD TORREFIED	B	

"

***

ANNEX 8

RESOLUTION MSC.356(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE PROTOCOL OF 1988 RELATING TO THE INTERNATIONAL CONVENTION ON LOAD LINES, 1966, AS AMENDED

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO article VI of the Protocol of 1988 relating to the International Convention on Load Lines, 1966 (hereinafter referred to as the "1988 Load Lines Protocol") concerning amendment procedures,

NOTING the proposed amendments to the 1988 Load Lines Protocol to make the Code for recognized organizations (RO Code) mandatory,

HAVING CONSIDERED, at its ninety-second session, amendments to the 1988 Load Lines Protocol proposed and circulated in accordance with paragraph 2(a) of article VI thereof,

1. ADOPTS, in accordance with paragraph 2(d) of article VI of the 1988 Load Lines Protocol, amendments to the 1988 Load Lines Protocol, the text of which is set out in the annex to the present resolution;

2. DETERMINES, in accordance with paragraph 2(f)(ii)(bb) of article VI of the 1988 Load Lines Protocol, that the said amendments shall be deemed to have been accepted on 1 July 2014, unless, prior to that date, more than one third of the Parties to the 1988 Load Lines Protocol or Parties the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of all the merchant fleets of all Parties, have notified their objections to the amendments;

3. INVITES the Parties concerned to note that, in accordance with paragraph 2(g)(ii) of article VI of the 1988 Load Lines Protocol, the amendments shall enter into force on 1 January 2015 upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with paragraph 2(e) of article VI of the 1988 Load Lines Protocol, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to the 1988 Load Lines Protocol;

5. ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization, which are not Parties to the 1988 Load Lines Protocol.

* * *

ANNEX

AMENDMENTS TO ANNEX B TO THE PROTOCOL OF 1988 RELATING TO THE INTERNATIONAL CONVENTION ON LOAD LINES, 1966, AS AMENDED

ANNEX I
Regulations for determining load lines

Chapter I
General

Regulation 2-1 – Authorization of recognized organizations

1 The existing text of regulation 2-1 is replaced with the following:

"The Administration shall authorize organizations, including classification societies, referred to in article 13 of the Convention and regulation 1(2) in accordance with the provisions of the present Convention and with the Code for Recognized Organizations (RO Code), consisting of part 1 and part 2 (the provisions of which shall be treated as mandatory) and part 3 (the provisions of which shall be treated as recommendatory), as adopted by the Organization by resolution MSC.349(92), as may be amended by the Organization, provided that:

(a) amendments to part 1 and part 2 of the RO Code are adopted, brought into force and take effect in accordance with the provisions of article VI of the present Protocol;

(b) amendments to part 3 of the RO Code are adopted by the Maritime Safety Committee in accordance with its Rules of Procedure; and

(c) any amendments adopted by the Maritime Safety Committee and the Marine Environment Protection Committee are identical and come into force or take effect at the same time, as appropriate."

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ANNEX 9

RESOLUTION MSC.357(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS (MODU CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO that the Assembly, when adopting resolution A.414(XI) on the *Code for the Construction and Equipment of Mobile Offshore Drilling Units* (MODU Code), authorized the Committee to amend the Code as necessary after due consultation with relevant organizations as the Committee deems necessary,

RECOGNIZING the need for introduction into this Code of provisions for enclosed space entry and rescue drills,

HAVING CONSIDERED, at its ninety-second session, the recommendations made by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its seventeenth session,

1. ADOPTS amendments to the MODU Code, set out in the annex to the present resolution;

2. INVITES all Governments concerned to take appropriate steps to give effect to the annexed amendments to the Code by 1 January 2015.

* * *

ANNEX

AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS (MODU CODE)

1 After subsection 10.6.3 "Emergency drills", insert new subsection 10.6.4 as follows:

"**10.6.4 Enclosed space entry and rescue drills**

.1 Crew members with enclosed space entry or rescue responsibilities should participate in an enclosed space entry and rescue drill to be held on board the unit, at least once every two months.

.2 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization*.

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships* (resolution A.1050(27)).

.3 Each enclosed space entry and rescue drill should include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of instruments for measuring the atmosphere in enclosed spaces;

.4 checking and use of rescue equipment and procedures; and

.5 instructions in first aid and resuscitation techniques."

2 Renumber existing subsection 10.6.4 as 10.6.5.

3 After existing section 14.4, insert new sections 14.5 and 14.6 as follows:

"**14.5 Procedures for entry into enclosed spaces**

Written procedures for entry into enclosed spaces should be provided which should take into account, as appropriate, the guidance provided in recommendations developed by the Organization*.

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships* (resolution A.1050(27)).

14.6 Records

The date when musters and enclosed space entry and rescue drills are held, details of abandonment drills, drills of other life-saving appliances and onboard training should be recorded in such logbook as may be prescribed by the Administration. If a full muster, drill or training session is not held at the appointed time, an entry should be made in the logbook stating the circumstances and the extent of the muster, drill or training session held."

4 Renumber existing sections 14.5 to 14.7 as 14.7 to 14.9, respectively.

***

ANNEX 10

RESOLUTION MSC.358(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 1989 (1989 MODU CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO that the Assembly, when adopting resolution A.649(16) on the *Code for the Construction and Equipment of Mobile Offshore Drilling Units, 1989* (1989 MODU Code), authorized the Committee to amend the Code, when appropriate, taking into consideration the developing design and safety features after due consultation with appropriate organizations,

RECOGNIZING the need for introduction into this Code of provisions for enclosed space entry and rescue drills,

HAVING CONSIDERED, at its ninety-second session, the recommendations made by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its seventeenth session,

1. ADOPTS amendments to the 1989 MODU Code, set out in the annex to the present resolution;

2. INVITES all Governments concerned to take appropriate steps to give effect to the annexed amendments to the 1989 MODU Code by 1 January 2015.

* * *

ANNEX

AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 1989 (1989 MODU CODE)

1 After existing section 14.4, insert new section 14.5 as follows:

"**14.5 Procedures for entry into enclosed spaces**

Written procedures for entry into enclosed spaces should be provided which should take into account, as appropriate, the guidance provided in recommendations developed by the Organization*.

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships* (resolution A.1050(27))."

2 Renumber existing sections 14.5 to 14.11 as 14.6 to 14.12, respectively.

3 After renumbered section 14.12, insert new section 14.13 as follows:

"**14.13 Enclosed space entry and rescue drills**

.1 Crew members with enclosed space entry or rescue responsibilities should participate in an enclosed space entry and rescue drill to be held on board the unit at least once every two months.

.2 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization*.

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships* (resolution A.1050(27)).

.3 Each enclosed space entry and rescue drill should include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of instruments for measuring the atmosphere in enclosed spaces;

.4 checking and use of rescue equipment and procedures; and

.5 instructions in first aid and resuscitation techniques."

4 Renumber existing section 14.13 as 14.14 and amend it to read:

"**14.14 Records**

The date when musters and enclosed space entry and rescue drills are held, details of abandonment drills, drills of other life-saving appliances and onboard training should be recorded in such logbook as may be prescribed by the Administration. If a full muster, drill or training session is not held at the appointed time, an entry should be made in the logbook stating the circumstances and the extent of the muster, drill or training session held."

5 In the existing paragraphs 14.8.9 and 14.11.3, references to the renumbered paragraphs are updated.

***

ANNEX 11

RESOLUTION MSC.359(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 2009 (2009 MODU CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO that the Assembly, when adopting resolution A.1023(26) on the *Code for the Construction and Equipment of Mobile Offshore Drilling Units, 2009 (2009 MODU Code)*, authorized the Committee to amend the Code as appropriate, taking into consideration development in the design and technologies, in consultation with appropriate organizations,

RECOGNIZING the need for introduction into this Code of provisions for enclosed space entry and rescue drills,

HAVING CONSIDERED, at its ninety-second session, the recommendations made by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its seventeenth session,

1. ADOPTS amendments to the 2009 MODU Code, set out in the annex to the present resolution;

2. INVITES all Governments concerned to take appropriate steps to give effect to the annexed amendments to the 2009 MODU Code by 1 January 2015.

* * *

ANNEX

AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 2009 (2009 MODU CODE)

1 After existing section 14.6, insert new section 14.7 as follows:

"**14.7 Procedures for entry into enclosed spaces**

Written procedures for entry into enclosed spaces should be provided which should take into account, as appropriate, the guidance provided in recommendations developed by the Organization*.

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships* (resolution A.1050(27))."

2 Renumber existing sections 14.7 to 14.12 as 14.8 to 14.13, respectively.

3 After renumbered section 14.13, insert new section 14.14 to read:

"**14.14 Enclosed space entry and rescue drills**

.1 Crew members with enclosed space entry or rescue responsibilities should participate in an enclosed space entry and rescue drill to be held on board the unit at least once every two months. If a full drill is not held at the appointed time, an entry should be made in the official log or tour record stating the circumstances and the extent of the drill held.

.2 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization*.

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships* (resolution A.1050(27)).

.3 Each enclosed space entry and rescue drill should include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of instruments for measuring the atmosphere in enclosed spaces;

.4 checking and use of rescue equipment and procedures; and

.5 instructions in first aid and resuscitation techniques."

4 Renumber existing sections 14.13 and 14.14 as 14.15 and 14.16, respectively.

5 In renumbered section 14.16 "Records", amend paragraph 14.16.1.2 to read:

"14.16.1.2 drills and exercises under paragraph 14.10.2 and sections 14.13 and 14.14."

6 In the existing paragraphs 14.1.2, 14.9.9, 14.12.3 and 14.14.2, references to the renumbered paragraphs are updated.

***

ANNEX 12

RESOLUTION MSC.360(92)
(Adopted on 21 June 2013)

AMENDMENTS TO THE CODE OF SAFETY FOR DYNAMICALLY SUPPORTED CRAFT (DSC CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO that the Assembly, when adopting resolution A.373(X) on the *Code of Safety for Dynamically Supported Craft* (DSC Code), authorized the Committee to amend the Code as may be necessary,

RECOGNIZING the need for introduction into this Code of provisions for enclosed space entry and rescue drills,

HAVING CONSIDERED, at its ninety-second session, the recommendations made by the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers, at its seventeenth session,

1. ADOPTS amendments to the DSC Code, set out in the annex to the present resolution;

2. INVITES all Governments concerned to take appropriate steps to give effect to the annexed amendments to the Code by 1 January 2015.

* * *

ANNEX

AMENDMENTS TO THE CODE OF SAFETY FOR DYNAMICALLY SUPPORTED CRAFT (DSC CODE)

Insert a new paragraph in chapter 17 "Operational requirements" as follows:

"17.5.4 Personnel with enclosed space entry or rescue responsibilities should participate in an enclosed space entry and rescue drill, to be held on board the craft, at least once every two months. Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization*.

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships* (resolution A.1050(27))."

***

ANNEX 18

RESOLUTION MSC.362(92)
(Adopted on 14 June 2013)

REVISED RECOMMENDATION ON A STANDARD METHOD FOR EVALUATING CROSS-FLOODING ARRANGEMENTS

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.266(VIII), by which the Assembly, at its eighth session, adopted the *Recommendation on a standard method for establishing compliance with the requirements for cross-flooding arrangements* in passenger ships,

RECALLING FURTHER resolution MSC.245(83), by which it, at its eighty-third session, adopted the *Recommendation on a standard method for evaluating cross-flooding arrangements*,

NOTING that the above *Recommendation on a standard method for evaluating cross-flooding arrangements* needed to be revised and improved, based on recent research results regarding cross-flooding,

RECOGNIZING the need to establish a methodology for evaluating cross-flooding arrangements on ships subject to the applicable subdivision and damage stability requirements of SOLAS chapter II-1 to ensure uniform treatment of cross-flooding and equalization arrangements,

HAVING CONSIDERED, at its ninety-second session, the *Revised Recommendation on a standard method for evaluating cross-flooding arrangements*, prepared by the Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety, at its fifty-fifth session,

1. ADOPTS the *Revised Recommendation on a standard method for evaluating cross-flooding arrangements*, the text of which is set out in the annex to the present resolution;

2. INVITES Governments to apply the annexed Revised Recommendation to ships constructed on or after 14 June 2013 and to bring it to the attention of all parties concerned;

3. NOTES that calculations to evaluate cross-flooding arrangements performed before 14 June 2013 remain valid.

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ANNEX

REVISED RECOMMENDATION ON A STANDARD METHOD FOR EVALUATING CROSS-FLOODING ARRANGEMENTS

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1 Definitions

$\sum \boldsymbol{k}$: Sum of friction coefficients in the considered cross-flooding arrangement.

s (m^2): Cross-section area of the cross-flooding pipe or duct. If the cross-section area is not circular, then:

$$s_{equiv} = \frac{\pi \cdot D_{equiv}^2}{4}$$

where:

$$D_{equiv} = \frac{4 \,.\, A}{p}$$

A = actual cross-section area
p = actual cross-section perimeter

$\boldsymbol{\theta_0}(°)$: Angle before commencement of cross-flooding. The cross-flooding device may be assumed to be full or empty dependent on its arrangement and internal volume (see figure 1(b) in appendix 1).

$\boldsymbol{\theta_f}(°)$: Heel angle at final equilibrium ($\boldsymbol{\theta_f} \leq \boldsymbol{\theta}$).

$\boldsymbol{\theta}(°)$: Any angle of heel between the commencement of cross-flooding and the final equilibrium at a given time.

$\boldsymbol{W_f}(\boldsymbol{m^3})$: Volume of water which is used to bring the ship from commencement of cross-flooding $\boldsymbol{\theta_0}$ to final equilibrium $\boldsymbol{\theta_f}$.

$\boldsymbol{W_\theta}(\boldsymbol{m^3})$: Volume of water which is used to bring the ship from any angle of heel θ to the final equilibrium $\boldsymbol{\theta_f}$.

$\boldsymbol{H_0}(\boldsymbol{m})$: Head of water before commencement of cross-flooding, with the same assumption as for $\boldsymbol{\theta_0}$.

$\boldsymbol{H_\theta}(\boldsymbol{m})$: Head of water when any angle of heel θ is achieved.

$\boldsymbol{h_f}(\boldsymbol{m})$: Final head of water after cross-flooding ($\boldsymbol{h_f} = \boldsymbol{0}$, when the level inside the equalizing compartment is equal to the free level of the sea).

***g* (m/s^2)**: The acceleration due to gravity (9.81 m/s^2).

2 Formulae

2.1 Time required from commencement of cross-flooding $\boldsymbol{\theta_0}$ to the final equilibrium $\boldsymbol{\theta_f}$:

$$T_f = \frac{2W_f}{S \cdot F} \cdot \frac{1}{\sqrt{2gH_0}} \cdot \frac{1}{\left(1 + \sqrt{\frac{h_f}{H_0}}\right)}$$

2.2 Time required to bring the ship from any angle of heel θ to the final equilibrium $\boldsymbol{\theta_f}$:

$$T_\theta = \frac{2W_\theta}{S \cdot F} \cdot \frac{1}{\sqrt{2gH_\theta}} \cdot \frac{1}{\left(1+\sqrt{\frac{h_f}{H_\theta}}\right)}$$

2.3 Time required from commencement of cross-flooding $\boldsymbol{\theta_0}$ until any angle of heel θ is achieved:

$$T = T_f - T_\theta$$

2.4 Dimensionless factor of reduction of speed through an equalization device, being a function of bends, valves, etc. in the cross-flooding system:

$$F = \frac{1}{\sqrt{(\sum k_i)+1}}$$

Values for k can be obtained from appendix 2 or other appropriate sources such as computational fluid dynamics (CFD) or model testing. If other appropriate sources are used, then the +1 factor in the formulae may not be appropriate. CFD can also be used to evaluate the discharge coefficient for the whole cross-flooding duct.

2.5 Cross-flooding through successive devices of different cross-section:

If the same flow crosses successive flooding devices of cross-section S_1, S_2, S_3... having corresponding friction coefficients k_1, k_2, k_3..., then the total k coefficient referred to S_1 is:

$$\sum k = k_1 + k_2 \cdot S_1^2/S_2^2 + k_3 \cdot S_1^2/S_3^2 \ldots$$

2.6 If different flooding devices are not crossed by the same volume, each k coefficient should be multiplied by the square of the ratio of the volume crossing the device and the volume crossing the reference section (which will be used for the time calculation):

$$\Sigma k = k_1 + k_2 \cdot S_1^2/S_2^2 \cdot W_2^2/W_1^2 + k_3 \cdot S_1^2/S_3^2 \cdot W_3^2/W_1^2 \ldots$$

2.7 For cross-flooding through devices in parallel that lead to the same space, equalization time should be calculated assuming that:

$$S \cdot F = S_1 \cdot F_1 + S_2 \cdot F_2 + \ldots$$

With $F = \frac{1}{\sqrt{(\sum k_i)+1}}$ for each device of cross-section S_i

3 Air pipe venting criteria

3.1 In arrangements where the total air pipe sectional area is 10 per cent or more of the cross-flooding sectional area, the restrictive effect of any air back pressure may be neglected in the cross-flooding calculations. The air pipe sectional area should be taken as the minimum or the net sectional area of any automatic closing devices, if that is less.

3.2 In arrangements where the total air pipe sectional area is less than 10 per cent of the cross-flooding sectional area, the restrictive effect of air back pressure should be considered in the cross-flooding calculations. The following method may be used for this purpose:

The k coefficient used in the calculation of cross-flooding time should take into account the drop of head in the air pipe. This can be done using an equivalent coefficient k_e, which is calculated according to the following formula:

$$k_e = k_w + k_a \cdot (\rho_a/\rho_w) \cdot (S_w/S_a)^2$$

where:

k_w = k coefficient for the cross-flooding arrangement (water)

k_a = k coefficient for the air pipe

ρ_a = air density

ρ_w = water density

S_w = cross-section area of the cross-flooding device (water)

S_a = cross-section of air pipe

4 Alternatives

As an alternative to the provisions in sections 2 and 3, and for arrangements other than those shown in appendix 2, direct calculation using computational fluid dynamics (CFD), time-domain simulations or model testing may also be used.

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Appendix 1

EXAMPLES FOR TREATMENT OF HEEL ANGLES AND WATER HEADS AT DIFFERENT STAGES OF CROSS-FLOODING

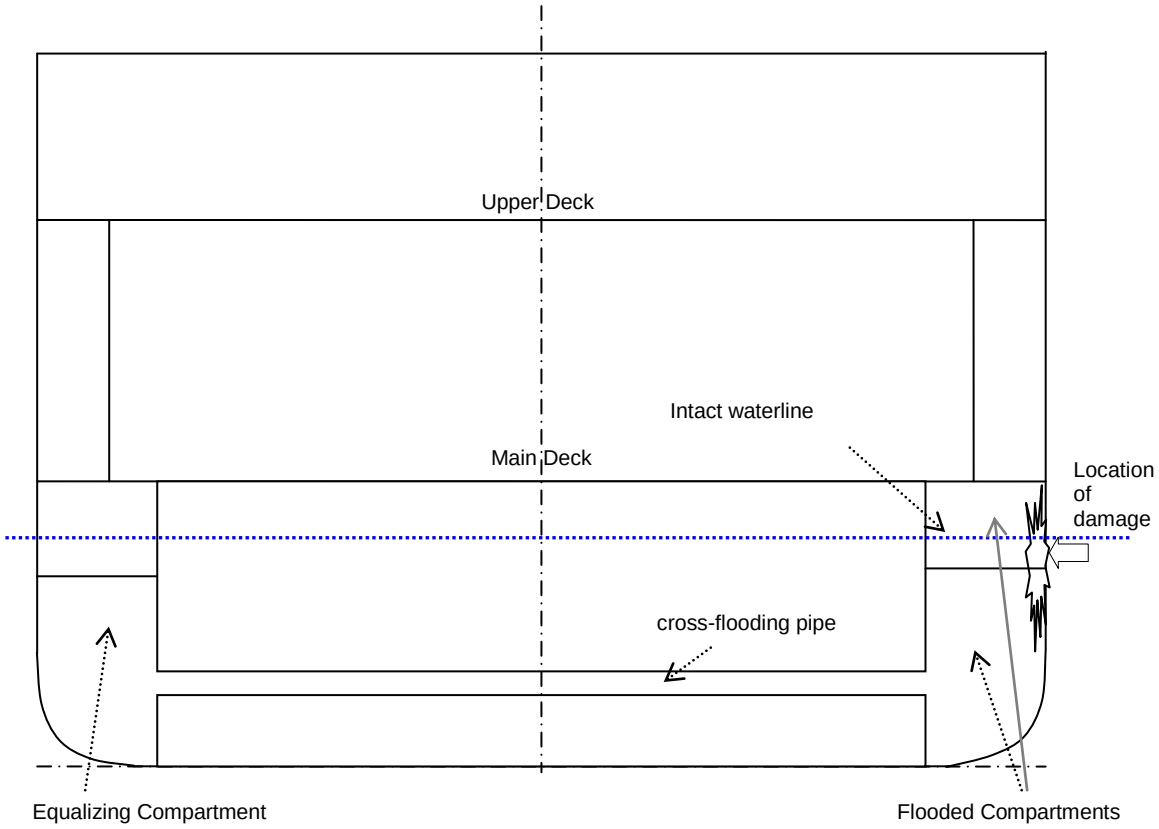

Figure 1(a) – Section showing cross-flooding pipe and compartments

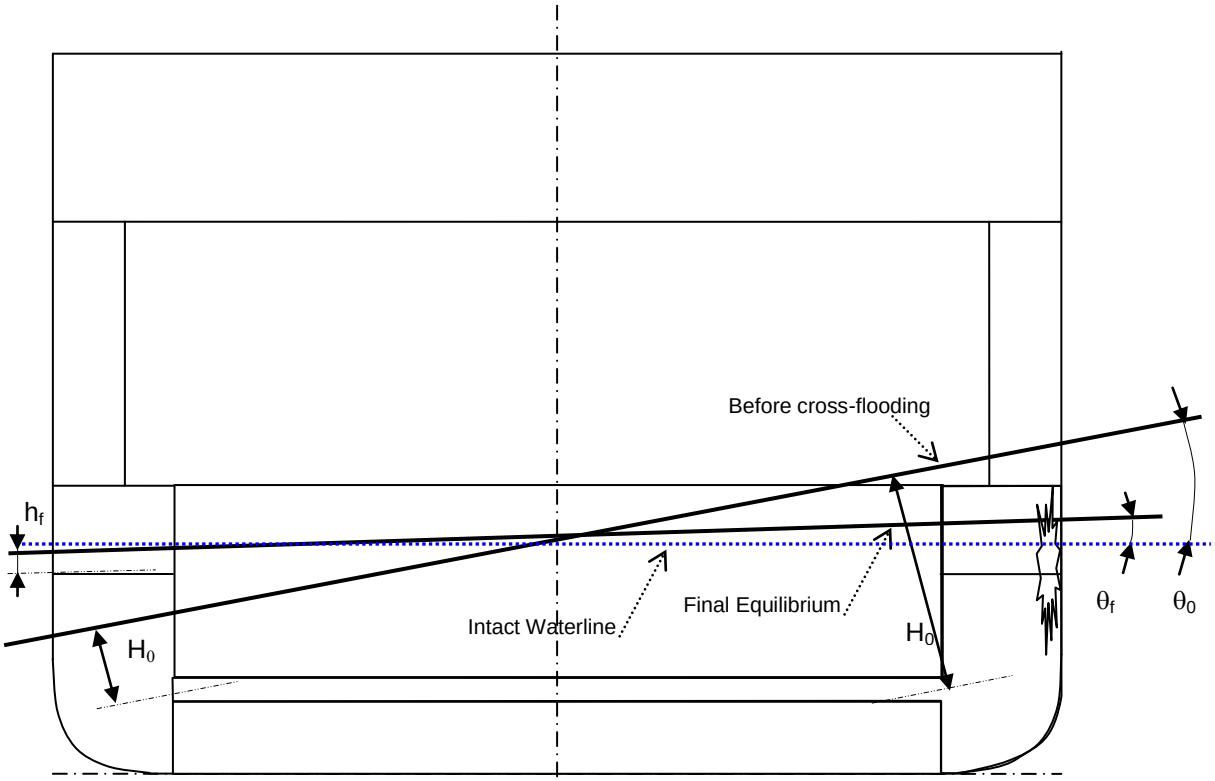

Figure 1(b) – Initial and Final stages of cross-flooding

Note: H_0 on the left side of figure 1(b) depicts the head of water if the cross-flooding device was assumed full whereas H_0 on the right side of figure 1(b) shows the head of water if the cross-flooding device was assumed empty.

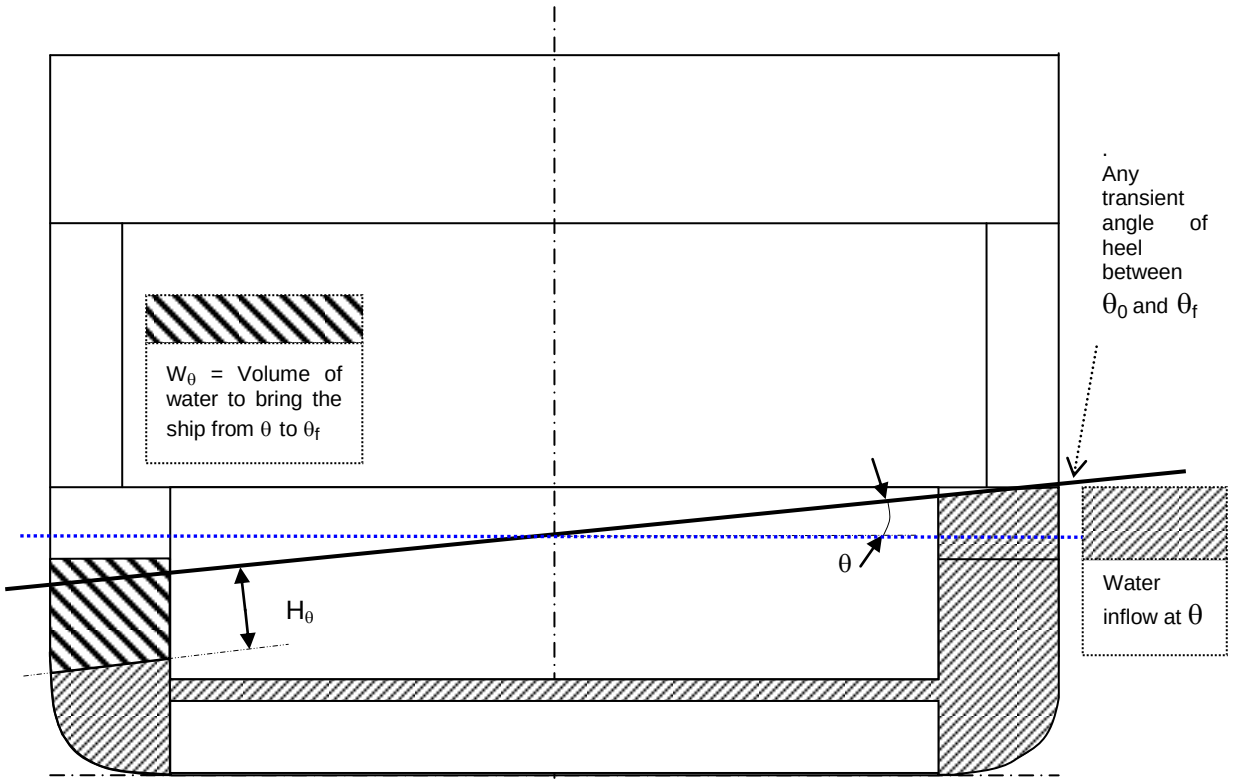

Figure 1(c) – Situation at any transient angle of heel, θ

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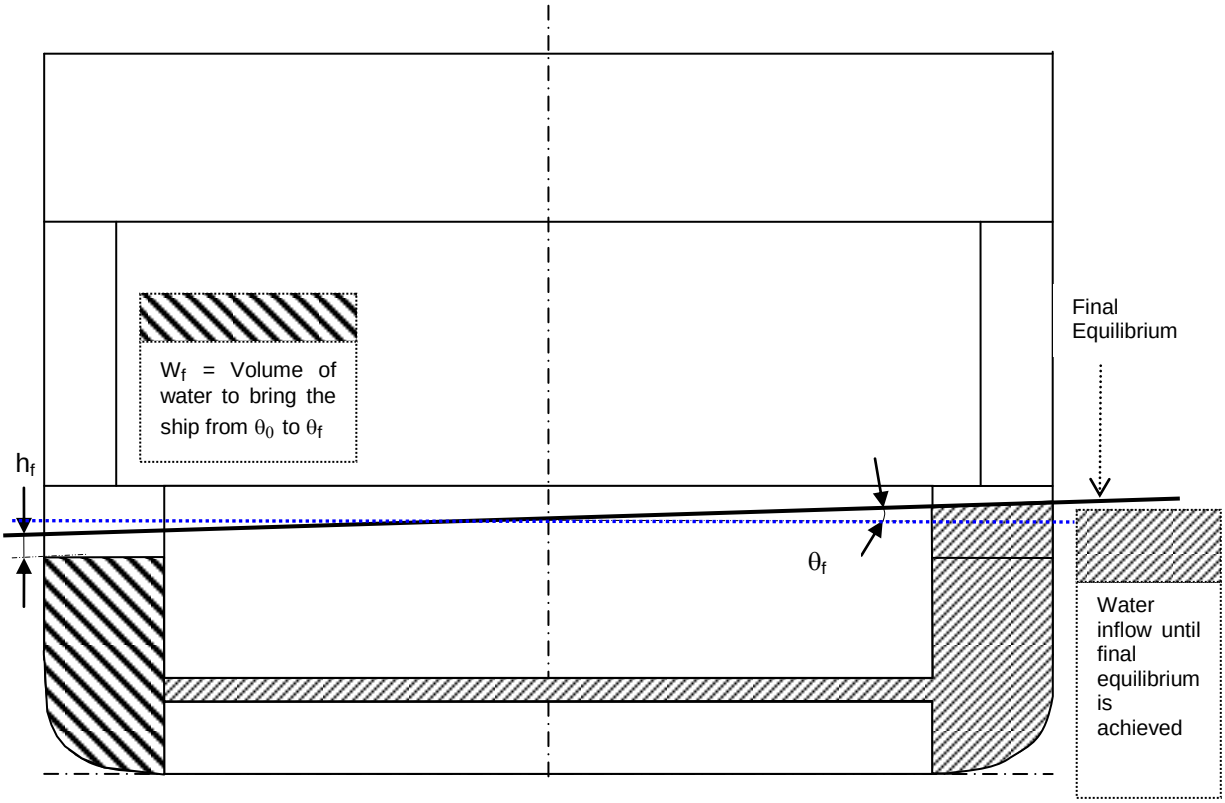

Figure 1(d) – Situation at final equilibrium

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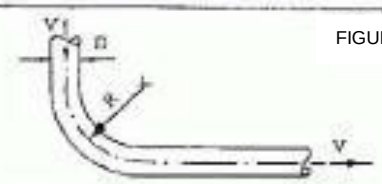
Appendix 2

FRICTION COEFFICIENTS IN CROSS-FLOODING ARRANGEMENTS

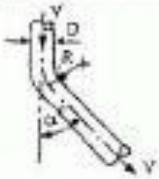
FIGURE 2



R/D	1	3	4	5	6	7
k	.30	.26	.23	.20	.18	.17

90° CIRCULAR BEND

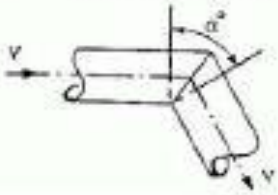
FIGURE 3



α°	15	30	45	60	75	90
k	.06	.13	.18	.24	.27	.30

RADIUS BEND R/D = 2

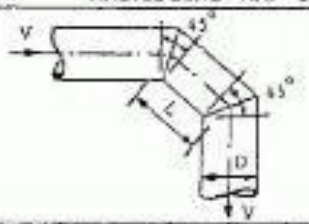
FIGURE 4



α°	5	15	30	45	60	90
k	.02	.06	.17	.32	.68	1.26

MITRE BEND

FIGURE 5



L/D	1	2	3	4	5	6
k	.41	.40	.43	.46	.46	.44

90° DOUBLE MITRE BEND

FIGURE 6

t/D	.01	.02	.03	.04	.05	≥.05
k	.83	.68	.53	.46	.44	.43

PIPE INLET

FIGURE 7

k = 0.5

The value of k actually increases with decrease in Froude number, particularly below speeds of 2 m/sec.

NON-RETURN VALVE

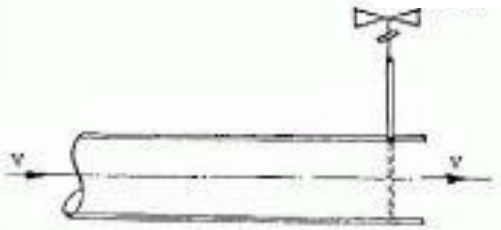
FIGURE 8

$$k = \frac{0.02}{D} \text{ per unit length}$$

The coefficient above is a mean value and does in fact vary as Reynold's number (i.e. varies with V for constant D and μ) as well as with relative roughness.

PIPE FRICTION LOSSES

FIGURE 9



k = 0.3

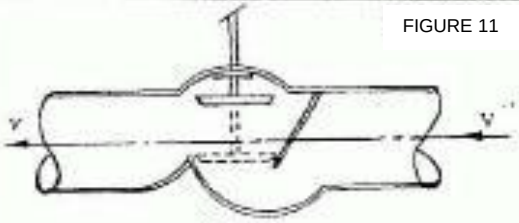
GATE VALVE

FIGURE 10

k = 0.8

BUTTERFLY VALVE

FIGURE 11



k = 5.0

DISC VALVE

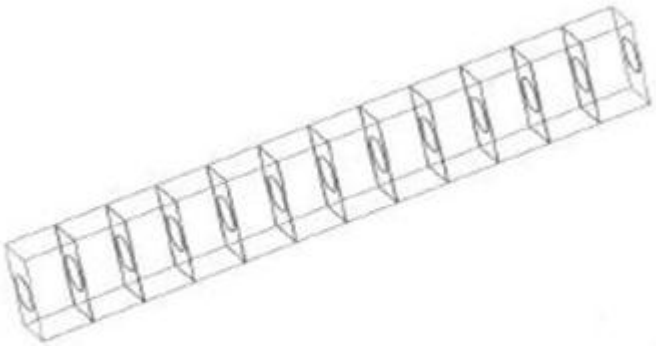


Figure 11
Cross-flooding through a series of structural ducts with 1 manhole

$$k = 0.6718 \times L_i^{\,0.119} \qquad (0 < L_i < 12)$$
$$k = 0.903 \qquad (12 \le L_i)$$

where:

k	friction coefficient related to each space between two adjacent girders
Li	Length of the duct in meters

Note: *k* is evaluated with effective cross-section area therefore in calculations use the real cross-section area A and not S_{equiv}. The pressure loss for entrance in the first manhole is already computed in the calculation.

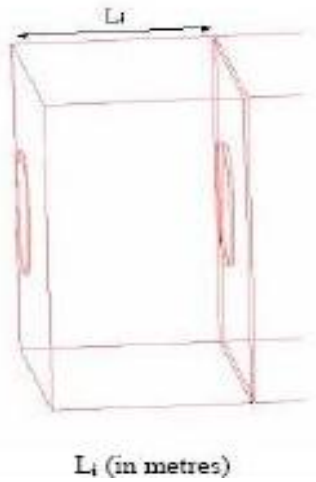


Figure 12

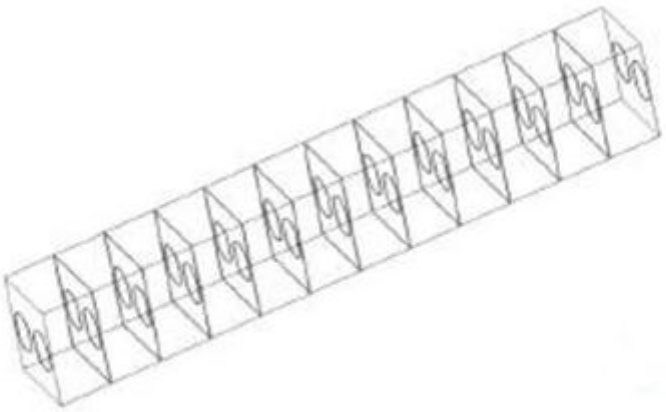


Figure 13
Cross-flooding through a series of structural ducts with 2 manholes

$$k = 1.7968 \times L_i^{-0.026} \quad (0 < L_i < 12)$$
$$k = 1.684 \quad (12 \leq L_i)$$

where:

k	friction coefficient related to each space between two adjacent girders
Li	Length of the duct in meters

Note: *k* is evaluated with effective cross-section area therefore in calculations use the real cross-section area A and not S_{equiv}. The pressure loss for entrance in the first manhole is already computed in the calculation.

* * *

Appendix 3

EXAMPLE USING FIGURES FOR A PASSENGER SHIP

Dimension of the considered cross-flooding pipe:

Diameter	D = 0.39 m
Length	l = 21.0 m
Cross-section area	S = 0.12 m2
Wall thickness	t = 17.5 mm

k-values for the considered cross-flooding system:

Inlet	0.45
Pipe friction $(\frac{0.02l}{D})$	1.08
2 radius bends (α = 45°)	0.36
Non-return valve	0.50

Sufficient air venting is assumed to be in place.

From this follows:

$$F = \frac{1}{\sqrt{(\sum k_i) + 1}} \qquad F = \frac{1}{\sqrt{3.39}} = 0.54$$

Time required from commencement of cross-flooding θ_0 to the final equilibrium condition θ_f:

$$T_f = \frac{2W_f}{S \cdot F} \cdot \frac{1}{\sqrt{2gH_0}} \frac{1}{\left(1 + \sqrt{\frac{h_f}{H_0}}\right)}$$

Head of water before commencement of cross-flooding:

$$H_0 = 5.3m$$

Volume of water which is used to bring the ship from commencement of cross-flooding to the final equilibrium condition:

$$W_f = 365m^3$$

Final head of water after cross-flooding:

$$h_f = 1.5m$$

$$T_f = \frac{2 \cdot 365m^3}{0.12m^2 \cdot 0.54} \cdot \frac{1}{\sqrt{2 \cdot 9.81 m/s^2 \cdot 5.3m}} \cdot \frac{1}{\left(1+\sqrt{\frac{1.5m}{5.3m}}\right)}$$

$$T_f = 721s$$

Calculation of any transient situation of cross-flooding:

The purpose is to find the situation after 600s.

Assumed transient situation:

Cross-flooded volume: 265 m^3

Volume of water which is used to bring the vessel from the transient situation to the final equilibrium : W_θ = 365 m^3 – 265 m^3 = 100 m^3

Corresponding head of water: H_θ = 2.8 m

Time required to bring the vessel from any transient situation to the final equilibrium condition:

$$T_\theta = \frac{2W_\theta}{S \cdot F} \cdot \frac{1}{\sqrt{2gH_\theta}} \cdot \frac{1}{\left(1+\sqrt{\frac{h_f}{H_\theta}}\right)}$$

$$T\theta = \frac{2 \cdot 100m_3}{0.12m_2 \cdot 0.54} \cdot \frac{1}{\sqrt{2*9.81m/s_2*2.8m}} \cdot \frac{1}{\left(1+\sqrt{\frac{1.5 \approx m}{2.8 \approx m}}\right)}$$

T_θ = 240 s

Time between commencement of cross-flooding and assumed transient situation:

T = T_f – T_θ = 721 s – 240 s = 481 s

As T is less than 600 s, further transient situations with larger cross-flooded volume may be calculated in the same way.

On the reverse, if T was of more than 600 s, further transient situation with smaller cross-flooded volume may be calculated.

Situation after 600 s may be found by successive iterations.

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ANNEX 23

RESOLUTION MSC.363(92)
(Adopted on 14 June 2013)

PERFORMANCE STANDARDS FOR ELECTRONIC INCLINOMETERS

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.886(21), by which the Assembly resolved that the function of adopting performance standards and technical specifications, as well as amendments thereto, shall be performed by the Maritime Safety Committee and/or the Marine Environment Protection Committee, as appropriate, on behalf of the Organization,

NOTING that in the *Revised Guidance to the master for avoiding dangerous situations in adverse weather and sea conditions* (MSC.1/Circ.1228), information about heel angle and roll period is regarded as relevant for assessment of the ship's stability situation in adverse weather and sea conditions,

NOTING ALSO that, at its ninetieth session, it had adopted resolution MSC.333(90) on *Revised Performance standards for shipborne voyage data recorders (VDRs)*,

NOTING FURTHER that, at its eighty-eighth session, instead of adding the requirement for an electronic inclinometer to the performance standards for VDRs, it had decided to develop dedicated performance standards for inclinometers,

RECOGNIZING the need to define minimum requirements for a heel angle and roll period measurement device to ensure that heeling information is provided in a reliable manner on board ships to be used by the crew to assess the dynamic situation of the ship and to be available for marine casualty investigation,

HAVING CONSIDERED, at its ninety-second session, the draft Performance standards for electronic inclinometers prepared by the Sub-Committee on Safety of Navigation, at its fifty-eighth session,

1. ADOPTS the Performance standards for electronic inclinometers, set out in the annex to the present resolution;

2. RECOMMENDS Governments ensure that electronic inclinometers installed on or after 1 July 2015, conform to performance standards not inferior to those specified in the annex to the present resolution.

ANNEX

PERFORMANCE STANDARDS FOR ELECTRONIC INCLINOMETERS

1 SCOPE

1.1 Electronic inclinometers are intended to support the decision-making process on board in order to avoid dangerous situations as well as assist in and facilitate maritime casualty investigations by providing information about the roll period and the heel angle of the ship.

1.2 Electronic inclinometers should, in a reliable form:

.1 determine the actual heel angle with the required accuracy;

.2 determine the roll amplitude with the required accuracy;

.3 determine the roll period with the required accuracy;

.4 present the information on a bridge display; and

.5 provide a standardized interface to instantaneous heel angle to the voyage data recorder (VDR).

2 APPLICATION OF THESE STANDARDS

2.1 These Performance standards should apply to all electronic inclinometers intended to support the decision-making process on board in order to avoid dangerous situations as well as to assist in maritime casualty investigations, if carried, on all ships[1].

2.2 In addition to the general requirements set out in the *General requirements for shipborne radio equipment forming part of the Global Maritime Distress and Safety System (GMDSS) and for electronic navigation aids* (resolution A.694(17)[2]) and the presentation requirements set out in the *Performance standards for the presentation of navigation-related information on shipborne navigational displays* (resolution MSC.191(79)), electronic inclinometers should meet the requirements of these standards and follow the relevant guidelines on ergonomic principles[3] adopted by the Organization.

3 DEFINITIONS

For the purpose of these Performance standards, the following definitions apply:

.1 *Rolling* is the motion around the longitudinal axis of the ship;

.2 *Actual heel angle* is the momentary angle of roll referenced to a levelled ship to port or starboard side;

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1 These Performance standards do not apply to electronic inclinometers installed for purposes which are outside the scope of these guidelines, e.g. monitoring of cargo status.

2 Refer to IEC Publication 60945 – Maritime navigation and radiocommunication equipment and systems – General requirements.

3 Refer to the *Guidelines on ergonomic criteria for bridge equipment and layout* (MSC/Circ.982).

.3 *Roll period* is the time between two successive maximum values of heel angle on the same side of the ship; and

.4 *Roll amplitude* is the maximum values of heel angle to port or starboard side.

MODULE A – SENSOR

4 MEASUREMENT OF ACTUAL HEEL ANGLE

Electronic inclinometers should be capable of measuring the actual heel angle and determining the amplitude of the rolling oscillation of the ship over a range of ± 90 degrees.

5 MEASUREMENT OF ROLL PERIOD

Electronic inclinometers should be capable of measuring the time between the maximum values of the rolling oscillation and determining the roll period over a minimum range of 4 to 40 s.

6 ACCURACY

6.1 Electronic inclinometers should provide the data with sufficient accuracy for a proper assessment of the ship's dynamic situation. Minimum accuracy of the measurements should be 5 per cent of reading or ± 1 degree, whichever is the greater for angle measurements and 5 per cent of reading or ± 1 s, whichever is the greater for time measurements.

6.2 Actual heel angle and time measurement accuracy should not be unduly affected by other linear or rotational movements of the ship (e.g. surging, swaying, heaving, pitching, yawing) or by transverse acceleration ranging from -0.8 g to +0.8 g.

MODULE B – OPERATIONAL AND FUNCTIONAL REQUIREMENTS

7 DISPLAY REQUIREMENTS

7.1 Electronic inclinometers should display:

.1 the roll period with a minimum resolution of 1 s; and

.2 the roll amplitude to both port and starboard side with a minimum resolution of 1 degree.

7.2 The actual heel angle to port or starboard should be indicated in an analogue form between the limits of ± 45 degrees.

7.3 The display may be implemented as a dedicated display or integrated into other bridge systems.

8 OPERATIONAL ALERTS

Electronic inclinometers may optionally provide a warning for indicating that a set heel angle had been exceeded.

9 PERFORMANCE TESTS, MALFUNCTIONS AND INDICATIONS

Electronic inclinometers should internally check and indicate to the user if all components are operative and if the information provided is valid or not.

MODULE C – INTERFACING AND INTEGRATION

10 CONNECTIONS TO OTHER EQUIPMENT

10.1 Electronic inclinometers should comprise a digital interface providing actual heel angle information to other systems like, e.g. VDR, with an update rate of at least 5 Hz. Electronic inclinometers should also comprise a digital interface providing the displayed information of roll period and roll amplitude (see paragraph 7.1).

10.2 Electronic inclinometers should have a bidirectional interface to facilitate communication, to transfer alerts from inclinometers to external systems and to acknowledge and silence alerts from external systems.

10.3 The digital interface should comply with the relevant international standards[4].

11 INSTALLATION POSITION

The installation position of the sensors of the electronic inclinometer should be recorded and made available for the configuration of the VDR.

12 POWER SUPPLY

Electronic inclinometers should be powered from the ship's main source of electrical energy. In addition, it should be possible to operate the electronic inclinometers from the ship's emergency source of electrical energy.

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[4] Refer to standard IEC 61162 – Maritime navigation and radiocommunication equipment and systems – Digital interfaces.

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MSC.1/Circ.1456
24 June 2013

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-2 AND THE FSS AND FTP CODES

1 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), with a view to providing more specific guidance for the application of the relevant requirements of chapter II-2 of the SOLAS Convention and the FSS and FTP Codes, approved unified interpretations of SOLAS chapter II-2 (annex 1), of the FSS Code (annex 2) and of the FTP Code (annex 3), prepared by the Sub-Committee on Fire Protection at its fifty-sixth session (7 to 11 January 2013).

2 Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of SOLAS chapter II-2 and the FSS and FTP Codes and to bring them to the attention of all parties concerned.

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ANNEX 1

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-2

1 Gas measurement and detection – portable instruments (regulation II-2/4.5.7.1)

The requirement of regulation II-2/4.5.7.1 for one portable instrument for measuring oxygen and one for measuring flammable vapour concentrations, and spares for both, should be considered as being satisfied when a minimum of two instruments, each capable of measuring both oxygen and flammable vapour concentrations are provided on board. Alternatively, two portable instruments for measuring oxygen and two portable instruments for measuring flammable vapour concentrations could be provided on board.

2 Control stations on cargo ships – application to cargo ships (regulation II-2/7.5.5)

As no reference to control stations is made for any of the protection methods provided in accordance with SOLAS regulations II-2/7.5.5.1, 7.5.5.2 and 7.5.5.3, control stations on cargo ships do not need to be covered by a fixed fire detection and fire alarm system.

3 Suction and discharge piping of emergency fire pumps which are run through the machinery space (regulation II-2/10.2.1.4.1)

3.1 "The valve" in the second sentence means "sea inlet valve".

3.2 In cases where suction or discharge piping penetrating machinery spaces are enclosed in a substantial steel casing, or are insulated to "A-60" class standards, it is not necessary to enclose or insulate "distance pieces", "sea inlet valves" and "sea-chests". For this purpose, the discharge piping means piping between the emergency fire pump and the isolating valve.

3.3 The method for insulating pipes to "A-60" class standards" is that they are to be covered/protected in a practical manner by insulation material which is approved as a part of "A-60" class divisions in accordance with the FTP Code.

3.4 Where the sea inlet valve is in the machinery space, the valve should not be a fail-close type. Where the sea inlet valve is in the machinery space and is not a fail-open type, measures should be taken so that the valve can be opened in the event of fire, e.g. control piping, actuating devices and/or electric cables with fire-resistant protection equivalent to "A-60" class standards.

3.5 In cases where main fire pumps are provided in compartments outside machinery spaces and where the emergency fire pump suction or discharge piping penetrates such compartments, the above interpretation should be applied to the piping.

4 Location of the fire main isolation valves in tankers (regulation II-2/10.2.1.4.4)

The complete interpretation of the phrase "the isolation valves shall be fitted in the fire main at the poop front in a protected position" would be that the valve should be located:

.1 within an accommodation space, service spaces and control station; or

.2 at least 5 m aft of the aft end of the aftermost cargo tank in case the valve is located on the open deck; or

.3 if the above is not practical, within 5 m aft of the cargo area provided it is protected from the cargo area by a permanent steel obstruction.

5 Application of carbon dioxide or inert system for self-heating solid bulk cargoes (regulations II-2/10.7.1.3 and II-2/10.7.2)

This self-heating phenomenon should be regarded as an emergency condition such that it is not necessary to provide a separate fixed carbon dioxide fire-extinguishing system or inert gas system dedicated to the control of the self-heating of the cargo within the cargo holds. The fixed carbon dioxide or inert gas fire-extinguishing system complying with the provisions of the FSS Code required by SOLAS regulation II-2/10.7.1.3 or II-2/10.7.2 may be used for this purpose. Fixed gas fire-extinguishing systems or inert gas systems installed on board dedicated exclusively to the protection of spaces other than cargo spaces should not be used for this purpose.

6 Emergency exit hatches to open deck (regulation II-2/13.1)

To facilitate a swift and safe means of escape to the lifeboat and liferaft embarkation deck, the following provisions should apply to overhead hatches fitted along the escape routes addressed by regulation II-2/13:

.1 the securing devices should be of a type which can be opened from both sides;

.2 the maximum force needed to open the hatch cover should not exceed 150 N; and

.3 the use of a spring equalizing, counterbalance or other suitable device on the hinge side to reduce the force needed for opening is acceptable.

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ANNEX 2

UNIFIED INTERPRETATIONS OF THE FSS CODE

Controls for releasing carbon dioxide and activating the alarm in the protected space (chapter 5, paragraphs 2.1.3.2 and 2.2.2)

1 The pre-discharge alarm may be activated before the two separate system release controls are operated (e.g. by a micro-switch that activates the pre-discharge alarm upon opening the release cabinet door as per paragraph 2.1.3.2). Therefore, the two separate controls for releasing carbon dioxide into the protected space (i.e. one control to open the valve of the piping which conveys the gas into the protected space and a second control used to discharge the gas from its storage containers) as per paragraph 2.2.2 can be independent of the control for activating the alarm.

2 A single control for activation of the alarm is sufficient.

3 The "positive means", referred to in paragraph 2.2.2.1 for the correct sequential operation of the controls, should be achieved by a mechanical and/or electrical interlock that does not depend on any operational procedure to achieve the correct sequence of operation.

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ANNEX 3

UNIFIED INTERPRETATION OF THE FTP CODE

Test for vertically supported textiles and films (paragraphs 3.1.1 and 3.1.2 of part 7 of annex 1 and paragraph 6.2.2 of appendix 1 to part 7 of annex 1)

The performance criteria for curtains, draperies of free-hanging product, as described in paragraphs 3.1.1 and 3.1.2, are also applicable with an edge application of the pilot flame.

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MSC.1/Circ.1457
24 June 2013

UNIFIED INTERPRETATIONS OF THE 2000 HSC CODE, AS AMENDED BY RESOLUTIONS MSC.175(79) AND MSC.222(82)

1 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), with a view to providing more specific guidance on the application of the relevant requirements of the 2000 HSC Code, as amended by resolutions MSC.175(79) and MSC.222(82), on matters related to fire safety, approved unified interpretations of chapter 7 of the Code, prepared by the Sub-Committee on Fire Protection, at its fifty-sixth session (7 to 11 January 2013).

2 Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of the 2000 HSC Code and to bring them to the attention of all parties concerned.

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ANNEX

**UNIFIED INTERPRETATIONS OF THE 2000 HSC CODE,
AS AMENDED BY RESOLUTIONS MSC.175(79) AND MSC.222(82)**

Paragraph 7.4.1.3 – Fire-restricting materials

1 This paragraph is intended to apply to all enclosed spaces and open cargo and ro-ro decks, except as defined below.

2 Spaces considered as being of no fire risk and open decks (except open cargo and ro-ro decks) need not comply with this requirement. In this context, spaces of no fire risk are those containing no ignition sources and only insignificant combustible materials (in addition to the combustible hull structure). Lights and bilge alarm devices may be accepted in these spaces if smoke detection is provided.

3 Dedicated storage rooms for gas fire-extinguishing systems may also be considered as spaces of no fire risk.

4 Insulation systems approved as a 30-min or 60-min fire-resisting division, as per paragraph 7.2.1 of the Code, need not be qualified as a fire-restricting material, provided that the insulation is non-combustible, as per the International Code for Application of Fire Test Procedures, 2010 (2010 FTP Code).

5 The test qualifying fire-restricting materials does not specify how to test floors. The following methods may be applied:

.1 for areas where a sprinkler system is not provided, a design with the deck of fibre-reinforced polymers covered by a non-combustible board or insulation faced with an approved floor covering according to the 2010 FTP Code, parts 2 and 5, may be accepted; and

.2 for areas where a sprinkler system is provided, a floor design with a floor covering approved according to the 2010 FTP Code, parts 2 and 5, applied directly on the deck constructed of fibre-reinforced polymers, may be accepted.

Paragraph 7.4.2.3 – Protection of load bearing structures

6 **Protection time** – the structural fire protection time of main load-bearing structures located within areas of major fire hazard (classified as A) and areas of moderate fire hazard (classified as B), and load bearing structures supporting control stations should, as a minimum, be the same as that required by tables 7.4-1 and 7.4-2 (as applicable), for the divisions enclosing the space where these supports are located. In accordance with paragraph 7.4.1.1, in no case should the structural fire protection time be less than 30 minutes.

7 **Insulation** – load-bearing structures made of steel, other than those constituting the divisions dealt with in tables 7.4-1 and 7.4-2 (as applicable), need not be insulated.

8 **Extent of structural fire protection** – the structures considered should be all load-carrying structures within areas of major and moderate fire hazard (classified as A or B), as well as all structures (irrespective of where they are located), which are necessary to support control stations.

9 The vertical extent of structure supporting control stations should be considered all the way down to and including spaces within the hull(s). However, all structures within voids in the hull can be exempted from this consideration based on paragraph 7.4.2.1 (first part) of the Code.

10 **Fire testing** – approvals from the standard fire test according to the 2010 FTP Code, annex 1, part 11, for a bulkhead or deck of a given material can be applied for protection of pillars of the same material. The structural fire protection time should be considered to be the same as that achieved in the fire test.

11 **Load case** – when load carrying capability calculations are performed for an assumed fire within a space, all insulated or un-insulated steel structures, including pillars, as well as fire insulated aluminium and FRP structures in the space may be included; uninsulated aluminium and FRP structures should not be included. A single fire concept can be applied where a fire is only presumed to originate in one enclosed space and not propagate to another enclosed space.

Example: Structures within a public space support a wheelhouse and a separate enclosed public space on the wheelhouse deck. Two load calculations should then be made:

.1 one presuming a fire below the wheelhouse; utilizing, in the load calculations, uninsulated steel and insulated aluminium and FRP structures within the public space on the wheelhouse deck;

.2 another presuming fire within the public spaces on the wheelhouse deck; utilizing, in the load calculations, uninsulated steel and insulated aluminium and FRP structures within the public space below the wheelhouse.

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24 June 2013

UNIFIED INTERPRETATION OF THE REVISED GUIDELINES FOR THE APPROVAL OF EQUIVALENT WATER-BASED FIRE-EXTINGUISHING SYSTEMS FOR MACHINERY SPACES AND CARGO PUMP-ROOMS (MSC/CIRC.1165)

1 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), approved the following unified interpretation of the *Revised Guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms* (MSC/Circ.1165), concerning the term "bilge area" (paragraph 3 of the annex to the Revised Guidelines), prepared by the Sub-Committee on Fire Protection, at its fifty-sixth session (7 to 11 January 2013):

> "Bilge area is the space between the engine-room floor plates (perforated or non-perforated) or gratings and the bottom of the engine-room."

2 Member Governments are invited to use the above interpretation when applying the Revised Guidelines and to bring it to the attention of all parties concerned.

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MSC.1/Circ.1459
8 July 2013

UNIFIED INTERPRETATION OF THE SOLAS CONVENTION AND THE IBC AND IGC CODES

1 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), with a view to providing guidance on the uniform application of the requirements for the location of entrances, air inlets and openings in the superstructures and/or deckhouses of oil and chemical tankers and gas carriers, contained in SOLAS chapter II-2 and the IBC and IGC Codes, approved the following unified interpretation, prepared by the Sub-Committee on Fire Protection, at its fifty-sixth session (7 to 11 January 2013):

> "If, under the requirements of the SOLAS Convention, the IBC Code or the IGC Code*, owing to the design of a ship, it is impossible in practice, or unreasonable, to fulfil the requirements relating to the location of access doors, air inlets or other openings in superstructures and/or deckhouses, the Administration or recognized organization acting on its behalf may adopt alternative provisions provided that, as a consequence of doing so, no ignition source is located in the hazardous areas defined in publication IEC 60092-502, except for electrical installations that have the required protection and have been certified as safe under that standard."

2 Member Governments are invited to use the above interpretation as guidance when applying relevant provisions of the SOLAS Convention and the IBC and IGC Codes, and to bring it to the attention of all parties concerned.

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* E.g. SOLAS regulations II-2/4.5.2.1, 4.5.2.2, 4.5.3.4.1, 11.6.2 and 16.3.2.3; IBC Code, paragraphs 3.2.3, 3.7.4, 8.3.4 and 8.5.1; and IGC Code, paragraphs 3.2.4, 3.8.4, 8.2.9, 8.2.10 and 10.2.5.1.

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MSC.1/Circ.1464
24 June 2013

UNIFIED INTERPRETATIONS OF SOLAS CHAPTERS II-1 AND XII, OF THE TECHNICAL PROVISIONS FOR MEANS OF ACCESS FOR INSPECTIONS (RESOLUTION MSC.158(78)) AND OF THE PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS (RESOLUTION MSC.145(77))

1 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), approved unified interpretations of the provisions of SOLAS chapters II-1 and XII, the Technical provisions for means of access for inspections (resolution MSC.158(78)) and of the *Performance standards for water level detectors on bulk carriers* (resolution MSC.145(77)), as set out in the annex, following the recommendations made by the Sub-Committee on Ship Design and Equipment at its fifty-seventh session, with a view to ensuring a uniform approach towards the application of the provisions of SOLAS chapters II-1 and XII.

2 Member Governments are invited to use the annexed interpretations when applying relevant provisions of SOLAS chapters II-1 and XII, and to bring them to the attention of all parties concerned.

3 This circular supersedes circulars MSC.1/Circ.1176 and MSC.1/Circ.1197.

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ANNEX

UNIFIED INTERPRETATIONS OF SOLAS CHAPTERS II-1 AND XII, OF THE TECHNICAL PROVISIONS FOR MEANS OF ACCESS FOR INSPECTIONS (RESOLUTION MSC.158(78)) AND OF THE PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS (RESOLUTION MSC.145(77))

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4 SOLAS regulations II-1/40 – General – and II-1/41 – Main source of electrical power and lighting systems

5 SOLAS regulation II-1/41 – Main source of electrical power and lighting systems

6 SOLAS regulations II-1/42 and II-1/43 – Emergency source of electrical power in passenger and cargo ships

7 SOLAS regulation II-1/44 – Starting arrangements for emergency generating sets

8 SOLAS chapter II-1, parts B – Subdivision and stability – and B1 – Subdivision and damage stability of cargo ships

9 SOLAS regulation XII/9 – Requirements for bulk carriers not being capable of complying with regulation 4.3 due to the design configuration of their cargo holds

10 SOLAS regulation XII/12 – Hold, ballast and dry space water ingress alarms, including the *Performance standards for water level detectors on bulk carriers* (resolution MSC.145(77))

11 SOLAS regulation XII/13 – Availability of pumping systems

1 SOLAS REGULATION II-1/3-6 – ACCESS TO AND WITHIN SPACES IN THE CARGO AREA OF OIL TANKERS AND BULK CARRIERS

1.1 SOLAS REGULATION II-1/3-6, SECTION 1

Interpretation

Oil tankers

This regulation is only applicable to oil tankers having integral tanks for carriage of oil in bulk, which is contained in the definition of oil in Annex I of MARPOL. Independent oil tanks can be excluded. Regulation II-1/3-6 should not normally be applied to FPSO or FSO unless the Administration decides otherwise.

Technical background

Means of Access (MA) specified in the Technical provisions contained in resolution MSC.158(78) are not specific with respect to the application to integral cargo oil tanks or also to independent cargo oil tanks. ESP requirements of oil tankers have been established assuming the target cargo oil tanks are integral tanks. The MA regulated under SOLAS regulation II-1/3-6 is for overall and close-up inspections as defined in regulation IX/1. Therefore it is assumed that the target cargo oil tanks are those of ESP, i.e. integral cargo tanks. Regulation II-1/3-6 is applicable to new, purpose-built FPSO or FSU if they are subject to the scope of the ESP Code (resolution A.1049(27), as amended). Considering that the principles of the *Technical provisions for means of access for inspections* (resolution MSC.158(78)) recognize that permanent means of access should be considered and provided for at the design stage so that, to the maximum extent possible, they can be made an integral part of the designed structural arrangement, regulation II-1/3-6 is not considered applicable to an FPSO/FSU that is converted from an existing tanker.

Reference

SOLAS regulation IX/1 and resolution A.744(18), as amended.

1.2 SOLAS REGULATION II-1/3-6, PARAGRAPH 2.1

Interpretation

Each space for which close-up inspection is not required such as fuel oil tanks and void spaces forward of cargo area, may be provided with a means of access necessary for overall survey intended to report on the overall conditions of the hull structure.

1.3 SOLAS REGULATION II-1/3-6, PARAGRAPH 2.2

Interpretation

Some possible alternative means of access are listed under paragraph 3.9 of the Technical provisions for means of access for inspections (TP). Always subject to acceptance as equivalent by the Administration, alternative means such as an unmanned robot arm, ROVs and dirigibles with necessary equipment of the permanent means of access for overall and close-up inspections and thickness measurements of the deck head structure such as deck transverses and deck longitudinals of cargo oil tanks and ballast tanks, should be capable of:

.1 safe operation in ullage space in gas-free environment; and

.2 introduction into the place directly from a deck access.

Technical background

Innovative approaches, in particular a development of robots in place of elevated passageways, are encouraged and it is considered worthwhile to provide the functional requirement for the innovative approach.

1.4 SOLAS REGULATION II-1/3-6, PARAGRAPH 2.3

Interpretation

Inspection

The MA arrangements, including portable equipment and attachments, should be periodically inspected by the crew or competent inspectors as and when it is going to be used to confirm that the MAs remain in serviceable condition.

Procedures

1 Any Company authorized person using the MA should assume the role of inspector and check for obvious damage prior to using the access arrangements. Whilst using the MA, the inspector should verify the condition of the sections used by close-up examination of those sections and note any deterioration in the provisions. Should any damage or deterioration be found, the effect of such deterioration should be assessed as to whether the damage or deterioration affects the safety for continued use of the access. Deterioration found that is considered to affect safe use should be determined as "substantial damage" and measures should be put in place to ensure that the affected section(s) are not to be further used prior to effective repair.

2 Statutory survey of any space that contains MA should include verification of the continued effectiveness of the MA in that space. Survey of the MA should not be expected to exceed the scope and extent of the survey being undertaken. If the MA is found deficient the scope of survey should be extended if this is considered appropriate.

3 Records of all inspections should be established based on the requirements detailed in the ship's Safety Management System. The records should be readily available to persons using the MAs and a copy attached to the MA Manual. The latest record for the portion of the MA inspected should include as a minimum the date of the inspection, the name and title of the inspector, a confirmation signature, the sections of MA inspected, verification of continued serviceable condition or details of any deterioration or substantial damage found. A file of permits issued should be maintained for verification.

Technical background

It is recognized that MA may be subject to deterioration in the long term due to corrosive environment and external forces from ship motions and sloshing of liquid contained in the tank. MA therefore should be inspected at every opportunity of tank/space entry. The above interpretation should be contained in a section of the MA Manual.

1.5 SOLAS REGULATION II-1/3-6, PARAGRAPH 3.1

Interpretation

Access to a double-side skin space of bulk carriers may be either from a topside tank or double-bottom tank or from both.

Technical background

Unless used for other purposes, the double-side skin space should be designed as a part of a large U-shaped ballast tank and such space should be accessed through the adjacent part of the tank, i.e. topside tank or double-bottom/bilge hopper tank. Access to the double-side skin space from the adjacent part rather than direct from the open deck is justified. Any such arrangement should provide a directly routed, logical and safe access that facilitates easy evacuation of the space.

1.6 SOLAS REGULATION II-1/3-6, PARAGRAPH 3.2

Interpretation

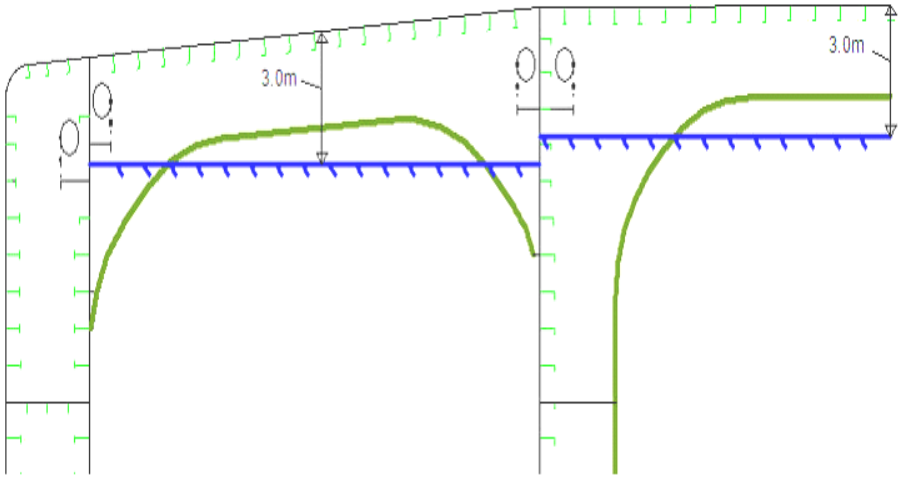
1 A cargo oil tank of less than 35 m length without a swash bulkhead requires only one access hatch.

2 Where rafting is indicated in the ship structures access manual as the means to gain ready access to the under-deck structure, the term "*similar obstructions*" referred to in the regulation includes internal structures (e.g. webs >1.5 m deep) which restrict the ability to raft (at the maximum water level needed for rafting of under-deck structure) directly to the nearest access ladder and hatchway to deck. When rafts or boats alone, as an alternative means of access, are allowed under the conditions specified in the ESP Code (resolution A.1049(27)), permanent means of access are to be provided to allow safe entry and exit. This means:

.1 access direct from the deck via a vertical ladder and small platform fitted approximately 2 m below the deck in each bay; or

.2 access to the deck from a longitudinal permanent platform having ladders to the deck in each end of the tank. The platform should, for the full length of the tank, be arranged in level with, or above, the maximum water level needed for rafting of the under-deck structure. For this purpose, the ullage corresponding to the maximum water level is to be assumed not more than 3 m from the deck plate measured at the midspan of deck transverses and in the middle length of the tank (see figure below). A permanent means of access from the longitudinal permanent platform to the water level indicated above should be fitted in each bay (e.g. permanent rungs on one of the deck webs inboard of the longitudinal permanent platform).

1.7 SOLAS REGULATION II-1/3-6, PARAGRAPH 4.1



Interpretation

1 The access manual should address spaces listed in paragraph 3 of regulation II-1/3-6. As a minimum the English version should be provided. The ship structure access manual should contain at least the following two parts:

Part 1: Plans, instructions and inventory required by paragraphs 4.1.1 to 4.1.7 of regulation II-1/3-6. This part should be approved by the Administration or the organization recognized by the Administration.

Part 2: Form of record of inspections and maintenance, and change of inventory of portable equipment due to additions or replacement after construction. This part should be approved for its form only at new building.

2 The following matters should be addressed in the ship structure access manual:

.1 the access manual should clearly cover scope as specified in the regulations for use by crews, surveyors and port State control officers;

.2 approval/re-approval procedure for the manual, i.e. any changes of the permanent, portable, movable or alternative means of access within the scope of the regulation and the Technical provisions are subject to review and approval by the Administration or by the organization recognized by the Administration;

.3 verification of MA should be part of the safety construction survey for continued effectiveness of the MA in that space which is subject to the statutory survey;

.4 inspection of MA by the crew and/or a competent inspector of the company as a part of regular inspection and maintenance (see interpretation of paragraph 2.3 of SOLAS regulation II-1/3-6);

.5 actions to be taken if MA is found unsafe to use; and

.6 in case of use of portable equipment plans showing the means of access within each space indicating from where and how each area in the space can be inspected.

1.8 SOLAS REGULATION II-1/3-6, PARAGRAPH 4.2

Interpretation

1 Critical structural areas should be identified by advanced calculation techniques for structural strength and fatigue performance, if available, and feedback from the service history and design development of similar or sister ships.

2 Reference should be made to the following publications for critical structural areas, where applicable:

.1 Oil tankers: Guidance Manual for Tanker Structures by TSCF;

.2 Bulk carriers: Bulk Carriers Guidelines for Surveys, Assessment and Repair of Hull Structure by IACS; and

.3 Oil tankers and bulk carriers: ESP Code (resolution A.1049(27)), as amended.

Technical background

These documents contain the relevant information for the present ship types. However, identification of critical areas for new double-hull tankers and double-side skin bulk carriers of improved structural design should be made by structural analysis at the design stage, this information should be taken into account to ensure appropriate access to all identified critical areas.

1.9 SOLAS REGULATION II-1/3-6, PARAGRAPH 5.1

Interpretation

The minimum clear opening of 600 mm x 600 mm may have corner radii up to 100 mm maximum. The clear opening is specified in MSC/Circ.686 to keep the opening fit for passage of personnel wearing a breathing apparatus. In such a case where as a consequence of structural analysis of a given design the stress should be reduced around the opening, it is considered appropriate to take measures to reduce the stress such as making the opening larger with increased radii, e.g. 600 x 800 with 300 mm radii, in which a clear opening of 600 x 600 mm with corner radii up to 100 mm maximum fits.

Technical background

The interpretation is based upon the established Guidelines in MSC/Circ.686.

Reference

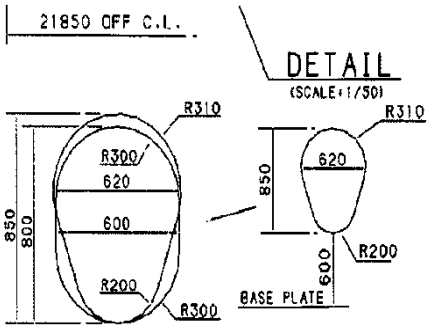
Paragraph 9 of the annex to MSC/Circ.686.

1.10 SOLAS REGULATION II-1/3-6, PARAGRAPH 5.2

Interpretation

1 The minimum clear opening of not less than 600 mm x 800 mm may also include an opening with corner radii of 300 mm. An opening of 600 mm in height x 800 mm in width may be accepted as access openings in vertical structures where it is not desirable to make large openings in the structural strength aspects, i.e. girders and floors in double-bottom tanks.

2 Subject to verification of easy evacuation of an injured person on a stretcher the vertical opening 850 mm x 620 mm with wider upper half than 600 mm, while the lower half may be less than 600 mm with the overall height not less than 850 mm is considered an acceptable alternative to the traditional opening of 600 mm x 800 mm with corner radii of 300 mm.



3 If a vertical opening is at a height of more than 600 mm steps then handgrips should be provided. In such arrangements it should be demonstrated that an injured person can be easily evacuated.

Technical background

The interpretation is based upon the established Guidelines in MSC/Circ.686 and an innovative design is considered for easy access by humans through the opening.

Reference

Paragraph 11 of the annex to MSC/Circ.686.

2 TECHNICAL PROVISIONS FOR MEANS OF ACCESS FOR INSPECTIONS (RESOLUTION MSC.158(78))

2.1 PARAGRAPH 1.3

Interpretation

A "combined chemical/oil tanker complying with the provisions of the IBC Code" is a tanker that holds both a valid IOPP certificate as a tanker and a valid certificate of fitness for the carriage of dangerous chemicals in bulk, i.e. a tanker that is certified to carry both oil cargoes under MARPOL Annex I and Chemical cargoes in chapter 17 of the IBC Code either as full or part cargoes. The Technical provisions should be applied to ballast tanks of combined chemical/oil tankers complying with the provisions of the IBC Code.

2.2 PARAGRAPH 1.4

Interpretation

1 In the context of the above requirement, the deviation should be applied only to distances between integrated PMA that are the subject of paragraph 2.1.2 of table 1.

2 Deviations should not be applied to the distances governing the installation of under-deck longitudinal walkways and dimensions that determine whether permanent access is required or not, such as height of the spaces and height to elements of the structure (e.g. cross-ties).

2.3 PARAGRAPH 3.1

Interpretation

The permanent means of access to a space can be credited for the permanent means of access for inspection.

Technical background

The Technical provisions specify means of access to a space and to hull structure for carrying out overall and close-up surveys and inspections. Requirements of MA to hull structure may not always be suitable for access to a space. However, if the MA for access to a space can also be used for the intended surveys and inspections such MA can be credited for the MA for use for surveys and inspections.

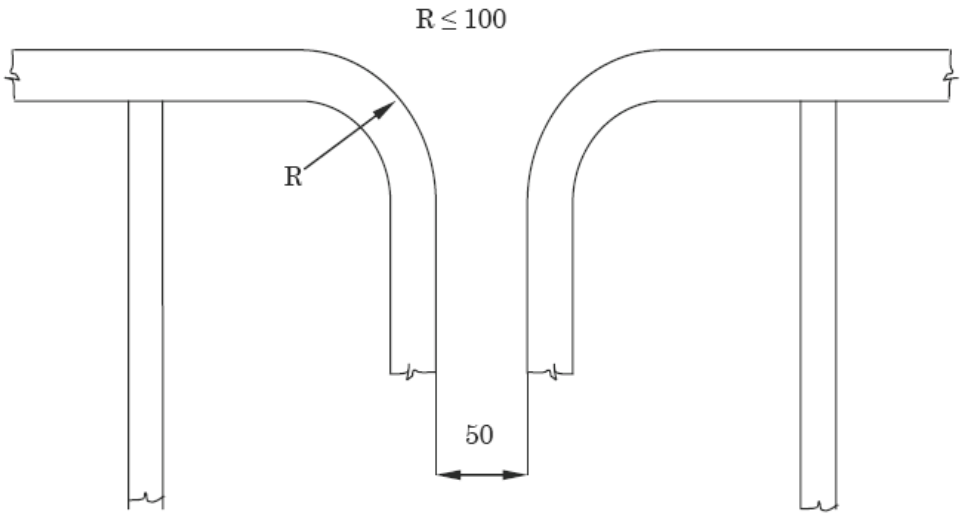
2.4 PARAGRAPH 3.3

Interpretation

1 Sloping structures are structures that are sloped by 5 or more degrees from horizontal plane when a ship is in an upright position at even-keel.

2 Guard rails should be fitted on the open side and should be at least 1,000 mm in height. For stand-alone passageways guard rails should be fitted on both sides of these structures. Guardrail stanchions are to be attached to the PMA. The distance between the passageway and the intermediate bar and the distance between the intermediate bar and the top rail should not be more than 500 mm.

3 Discontinuous top handrails are allowed, provided the gap does not exceed 50 mm. The same maximum gap is to be considered between the top handrail and other structural members (i.e. bulkhead, web frame, etc.). The maximum distance between the adjacent stanchions across the handrail gaps is to be 350 mm where the top and mid handrails are not connected together and 550 mm when they are connected together. The maximum distance between the stanchion and other structural members is not to exceed 200 mm where the top and mid handrails are not connected together and 300 mm when they are connected together. When the top and mid handrails are connected by a bent rail, the outside radius of the bent part is not to exceed 100 mm (see figure below).



4 Non-skid construction is such that the surface on which personnel walks provides sufficient friction to the sole of boots even if the surface is wet and covered with thin sediment.

5 "Substantial construction" is taken to refer to the as designed strength as well as the residual strength during the service life of the vessel. Durability of passageways together with guard rails should be ensured by the initial corrosion protection and inspection and maintenance during services.

6 For guard rails, use of alternative materials such as GRP should be subject to compatibility with the liquid carried in the tank. Non-fire resistant materials should not be used for means of access to a space with a view to securing an escape route at a high temperature.

7 Requirements for resting platforms placed between ladders should be equivalent to those applicable to elevated passageways.

Reference

Paragraph 10 of the annex to MSC/Circ.686.

2.5 PARAGRAPH 3.4

Interpretation

Where the vertical manhole is at a height of more than 600 mm above the walking level, it should be demonstrated that an injured person can be easily evacuated.

2.6 PARAGRAPH 3.5

Interpretation

MA for access to ballast tanks, cargo tanks and spaces other than fore peak tanks:

For oil tankers:

1 Tanks and subdivisions of tanks having a length of 35 m or more with two access hatchways:

First access hatchway: Inclined ladder or ladders should be used.

Second access hatchway:

.1 A vertical ladder may be used. In such a case where the vertical distance is more than 6 m, vertical ladders should comprise one or more ladder-linking platforms spaced not more than 6 m apart vertically and displaced to one side of the ladder.

The uppermost section of the vertical ladder, measured clear of the overhead obstructions in the way of the tank entrance, should not be less than 2.5 m but not exceed 3.0 m and should comprise a ladder-linking platform which should be displaced to one side of a vertical ladder. However, the vertical distance of the uppermost section of the vertical ladder may be reduced to 1.6 m, measured clear of the overhead obstructions in the way of the tank entrance, if the ladder lands on a longitudinal or athwartship permanent means of access fitted within that range; or

.2 Where an inclined ladder or combination of ladders is used for access to the space, the uppermost section of the ladder, measured clear of the overhead obstructions in the way of the tank entrance, should be vertical for not less than 2.5 m but not exceed 3.0 m and should comprise a landing platform continuing with an inclined ladder. However, the vertical distance of the uppermost section of the vertical ladder may be reduced to 1.6 m, measured clear of the overhead obstructions in the way of the tank entrance, if the ladder lands on a longitudinal or athwartship permanent means of access fitted within that range. The flights of the inclined ladders are normally to be not more than 6 m in vertical height. The lowermost section of the ladders may be vertical for the vertical distance not exceeding 2.5 m.

2 Tanks less than 35 m in length and served by one access hatchway: an inclined ladder or combination of ladders should be used to the space as specified in 1.2 above.

3 In spaces of less than 2.5 m in width the access to the space may be by means of vertical ladders that comprise one or more ladder-linking platforms spaced not more than 6 m apart vertically and displaced to one side of the ladder. The uppermost section of the vertical ladder, measured clear of the overhead obstructions in the way of the tank entrance, should not be less than 2.5 m but not exceed 3.0 m and should comprise a ladder-linking platform which should be displaced to one side of a vertical ladder. However, the vertical distance of the uppermost section of the vertical ladder may be reduced to 1.6 m, measured clear of the overhead obstructions in the way of the tank entrance, if the ladder lands on a longitudinal or athwartship permanent means of access fitted within that range. Adjacent sections of the ladder should be laterally offset from each other by at least the width of the ladder (see paragraph 20 of MSC/Circ.686).

4 Access from the deck to a double-bottom space may be by means of vertical ladders through a trunk. The vertical distance from deck to a resting platform, between resting platforms, or a resting platform and the tank bottom should not be more than 6 m, unless otherwise approved by the Administration.

MA for inspection of the vertical structure of oil tankers:

Vertical ladders provided for means of access to the space may be used for access for inspection of the vertical structure.

Unless stated otherwise in table 1 of TP, vertical ladders that are fitted on vertical structures for inspection should comprise one or more ladder-linking platforms spaced not more than 6 m apart vertically and displaced to one side of the ladder. Adjacent sections of ladder should be laterally offset from each other by at least the width of the ladder (see paragraph 20 of MSC/Circ.686).

Obstruction distances

The minimum distance between the inclined ladder face and obstructions, i.e. 750 mm and, in the way of openings, 600 mm specified in TP 3.5 should be measured perpendicular to the face of the ladder.

Technical background

It is common practice to use a vertical ladder from the deck to the first landing to clear overhead obstructions before continuing to an inclined ladder or a vertical ladder displaced to one side of the first vertical ladder.

Reference

For vertical ladders: paragraph 20 of the annex to MSC/Circ.686.

2.7 PARAGRAPH 3.6

Interpretation

1 The vertical height of handrails should not be less than 890 mm from the centre of the step and two course handrails need only be provided where the gap between the stringer and the top handrail is greater than 500 mm.

2 The requirement of two square bars for treads specified in TP, paragraph 3.6, is based upon the specification of the construction of ladders in paragraph 3(e) of annex 1 to resolution A.272(VIII), which addresses inclined ladders. TP, paragraph 3.4, allows for single rungs fitted to vertical surfaces, which is considered a safe grip. For vertical ladders, when steel is used, the rungs should be formed of single square bars of not less than 22 mm by 22 mm for the sake of safe grip.

3 The width of inclined ladders for access to a cargo hold should be at least 450 mm to comply with the Australian AMSA Marine Orders part 32, appendix 17.

4 The width of inclined ladders other than an access to a cargo hold should be not less than 400 mm.

5 The minimum width of vertical ladders should be 350 mm and the vertical distance between the rungs should be equal and should be between 250 mm and 350 mm.

6 A minimum climbing clearance in width should be 600 mm other than the ladders placed between the hold frames.

7 The vertical ladders should be secured at intervals not exceeding 2.5 m apart to prevent vibration.

Technical background

1 TP, paragraph 3.6, is a continuation of TP, paragraph 3.5, which addresses inclined ladders. Interpretations for vertical ladders are needed based upon the current standards of IMO, AMSA or the industry.

2 Interpretations 2 and 5 address vertical ladders based upon the current standards.

3 Double square bars for treads become too large for a grip for vertical ladders and single rungs facilitate a safe grip.

4 Interpretation 7 is introduced consistently with the requirement and the interpretation of TP, paragraph 3.4.

Reference

1 Annex 1 to resolution A.272(VIII).

2 Australian AMSA Marine Orders part 32, appendix 17.

3 ILO Code of Practice "Safety and Health in Dockwork" – section 3.6, Access to Ship's Holds.

2.8 PARAGRAPH 3.9.6

Interpretation

A mechanical device such as hooks for securing at the upper end of a ladder should be considered as an appropriate securing device if a movement fore/aft and sideways can be prevented at the upper end of the ladder.

Technical background

Innovative design should be accepted if it fits the functional requirement with due consideration for safe use.

2.9 PARAGRAPHS 3.10 AND 3.11

Interpretation

See interpretation for paragraphs 5.1 and 5.2 of SOLAS regulation II-1/3-6.

2.10 PARAGRAPH 3.13.1

Interpretation

Either a vertical or an inclined ladder or a combination of them may be used for access to a cargo hold where the vertical distance is 6 m or less from the deck to the bottom of the cargo hold.

2.11 TABLE 1 – MEANS OF ACCESS FOR BALLAST AND CARGO TANKS OF OIL TANKERS, PARAGRAPH 1.1

Interpretation

1 Subparagraphs .1, .2 and .3 define access to under-deck structure, access to the uppermost sections of transverse webs and connection between these structures.

2 Subparagraphs .4, .5 and .6 define access to vertical structures only and are linked to the presence of transverse webs on longitudinal bulkheads.

3 If there are no under-deck structures (deck longitudinals and deck transverses) but there are vertical structures in the cargo tank supporting transverse and longitudinal bulkheads, access in accordance with subparagraphs from .1 through to .6 should be provided for inspection of the upper parts of vertical structure on transverse and longitudinal bulkheads.

4 If there is no structure in the cargo tank, section 1.1 of table 1 should not be applied.

5 Section 1 of table 1 should also be applied to void spaces in the cargo area, comparable in volume to spaces covered by regulation II-1/3-6, except those spaces covered by section 2.

6 The vertical distance below the overhead structure should be measured from the underside of the main deck plating to the top of the platform of the means of access at a given location.

7 The height of the tank should be measured at each tank. For a tank the height of which varies at different bays, item 1.1 should be applied to such bays of a tank that have a height of 6 m and over.

Technical background

Interpretation 7, if the height of the tank is increasing along the length of a ship, the permanent means of access should be provided locally where the height is above 6 m.

Reference

Paragraph 10 of the annex to MSC/Circ.686.

2.12 TABLE 1 – MEANS OF ACCESS FOR BALLAST AND CARGO TANKS OF OIL TANKERS, PARAGRAPH 1.1.2

Interpretation

There is a need to provide a continuous longitudinal permanent means of access when the deck longitudinals and deck transverses are fitted on deck but supporting brackets are fitted under the deck.

2.13 TABLE 1 – MEANS OF ACCESS FOR BALLAST AND CARGO TANKS OF OIL TANKERS, PARAGRAPH 1.1.3

Interpretation

Means of access to tanks may be used for access to the permanent means of access for inspection.

Technical background

As a matter of principle, in such a case where the means of access can be utilized for the purpose of accessing structural members for inspection there is no need of duplicated installation of the MA.

2.14 TABLE 1 – MEANS OF ACCESS FOR BALLAST AND CARGO TANKS OF OIL TANKERS, PARAGRAPH 1.1.4

Interpretation

The permanent fittings required to serve alternative means of access such as wire lift platform, that should be used by crew and surveyors for inspection should provide at least an equal level of safety as the permanent means of access stated by the same paragraph. These means of access should be carried on board the ship and be readily available for use without filling of water in the tank. Therefore, rafting should not be acceptable under this provision. Alternative means of access should be part of the Access Manual which should be approved on behalf of the flag State. For water ballast tanks of 5 m or more in width, such as on an ore carrier, side shell plating should be considered in the same way as "longitudinal bulkhead".

2.15 TABLE 1 – MEANS OF ACCESS FOR BALLAST AND CARGO TANKS OF OIL TANKERS, PARAGRAPH 2.1

Interpretation

Section 2 of table 1 should also be applied to wing tanks designed as void spaces. Paragraph 2.1.1 represents requirements for access to under-deck structures, while paragraph 2.1.2 is a requirement for access for survey and inspection of vertical structures on longitudinal bulkheads (transverse webs).

Technical background

Regulation II-1/3-6.2.1 requires each space to be provided with means of access. Though void spaces are not addressed in the technical provisions contained in resolution MSC.158(78), it is arguable whether MA are not required in void spaces. MA or portable means of access are necessary arrangements to facilitate inspection of the structural condition of the space and the boundary structure. Therefore the requirements of section 2 of table 1 should be applied to double-hull spaces even when designed as void spaces.

2.16 TABLE 1 – MEANS OF ACCESS FOR BALLAST AND CARGO TANKS OF OIL TANKERS, PARAGRAPH 2.1.1

Interpretation

1 For a tank, the vertical distance between horizontal upper stringer and deck head of which varies at different sections, item 2.1.1 should be applied to such sections that fall under the criteria.

2 The continuous permanent means of access may be a wide longitudinal, which provides access to critical details on the opposite side by means of platforms as necessary on web frames. In case the vertical opening of the web frame is located in the way of the open part between the wide longitudinal and the longitudinal on the opposite side, platforms should be provided on both sides of the web frames to allow safe passage through the web frame.

3 Where two access hatches are required by SOLAS regulation II-1/3-6.3.2, access ladders at each end of the tank should lead to the deck.

Technical background

Interpretation 1: The interpretation of varied tank height in item 1 of table 1 is applied to the vertical distance between horizontal upper stringer and deck head for consistency.

2.17 TABLE 1 – MEANS OF ACCESS FOR BALLAST AND CARGO TANKS OF OIL TANKERS, PARAGRAPH 2.1.2

Interpretation

The continuous permanent means of access may be a wide longitudinal, which provides access to critical details on the opposite side by means of platforms as necessary on web frames. In case the vertical opening of the web is located in the way of the open part between the wide longitudinal and the longitudinal on the opposite side, platforms should be provided on both sides of the web to allow safe passage through the web. A "reasonable deviation", as noted in TP, paragraph 1.4, of not more than 10 per cent may be applied where the permanent means of access is integral with the structure itself.

2.18 TABLE 1 – MEANS OF ACCESS FOR BALLAST AND CARGO TANKS OF OIL TANKERS, PARAGRAPH 2.2

Interpretation

1 Permanent means of access between the longitudinal continuous permanent means of access and the bottom of the space should be provided.

2 The height of a bilge hopper tank located outside of the parallel part of the ship should be taken as the maximum of the clear vertical distance measured from the bottom plating to the hopper plating of the tank.

3 The foremost and aftmost bilge hopper ballast tanks with raised bottom, of which the height is 6 m and over, a combination of transverse and vertical MA for access to the upper knuckle point for each transverse web, should be accepted in place of the longitudinal permanent means of access.

Technical background

Interpretation 2: The bilge hopper tanks at fore and aft of cargo area narrow due to raised bottom plating and the actual vertical distance from the bottom of the tank to hopper plating of the tank is more appropriate to judge if a portable means of access could be utilized for the purpose.

Interpretation 3: In the foremost or aftmost bilge hopper tanks where the vertical distance is 6 m or over but installation of longitudinal permanent means of access is not practicable, permanent means of access of combination of transverse and vertical ladders provides an alternative means of access to the upper knuckle point.

2.19 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 1.1

Interpretation

1 Means of access should be provided to the cross-deck structures of the foremost and aftermost part of each cargo hold.

2 Interconnected means of access under the cross deck for access to three locations at both sides and in the vicinity of the centreline should be acceptable as the three means of access.

3 Permanent means of access fitted at three separate locations accessible independently, one at each side and one in the vicinity of the centreline, should be acceptable.

4 Special attention should be paid to the structural strength where any access opening is provided in the main deck or cross deck.

5 The requirements for a bulk carrier cross-deck structure should also be considered applicable to ore carriers.

Technical background

Pragmatic arrangements of the MA are provided.

2.20 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 1.3

Interpretation

Particular attention should be paid to preserve the structural strength in way of access opening provided in the main deck or cross deck.

2.21 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 1.4

Interpretation

"Full upper stools" are understood to be stools with a full extension between topside tanks and between hatch end beams.

2.22 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 1.5

Interpretation

1 The movable means of access to the under-deck structure of cross deck need not necessarily be carried on board the ship. It should be sufficient if it is made available when needed.

2 The requirements for a bulk carrier cross-deck structure should also be considered applicable to ore carriers.

2.23 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 1.6

Interpretation

The maximum vertical distance of the rungs of vertical ladders for access to hold frames should be 350 mm. If a safety harness is to be used, means should be provided for connecting the safety harness in suitable places in a practical way.

Technical background

The maximum vertical distance of the rungs of 350 mm is applied with a view to reducing trapping cargoes.

2.24 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 1.7

Interpretation

Portable, movable or alternative means of access should also be applied to corrugated bulkheads.

2.25 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 1.8

Interpretation

Readily available means able to be transported to location in cargo hold and safely erected by ships' crew.

2.26 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 2.3

Interpretation

If the longitudinal structures on the sloping plate are fitted outside of the tank, a means of access should be provided.

2.27 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 2.5

Interpretation

1 The height of a bilge hopper tank located outside of the parallel part of the vessel should be taken as the maximum of the clear vertical height measured from the bottom plating to the hopper plating of the tank.

2 It should be demonstrated that portable means for inspection can be deployed and made readily available in the areas where needed.

2.28 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 2.5.2

Interpretation

A wide longitudinal frame of at least 600 mm clear width may be used for the purpose of the longitudinal continuous permanent means of access. The foremost and aftermost bilge hopper ballast tanks with raised bottom, of which the height is 6 m and over, a combination of transverse and vertical MA for access to the sloping plate of hopper tank connection with side shell plating for each transverse web can be accepted in place of the longitudinal permanent means of access.

2.29 TABLE 2 – MEANS OF ACCESS FOR BULK CARRIERS, PARAGRAPH 2.6

Interpretation

The height of web frame rings should be measured in way of side shell and tank base.

Technical background

In the bilge hopper tank the sloping plating is above the opening, while the movement of the surveyor is along the bottom of the tank. Therefore the measurement of 1 m should be taken from the bottom of the tank.

3 SOLAS REGULATION II-1/26 – GENERAL

3.1 SOLAS REGULATION II-1/26.4, DEAD SHIP CONDITION

Interpretation

1 Dead ship condition for the purpose of regulation II-1/26.4 should be understood to mean a condition under which the main propulsion plant, boilers and auxiliaries are not in operation and in restoring the propulsion, no stored energy for starting and operating the propulsion plant, the main source of electrical power and other essential auxiliaries is assumed to be available.

2 Where the emergency source of power is an emergency generator which complies with regulation II-1/44, IACS SC185 and IACS SC124, this generator may be used for restoring operation of the main propulsion plant, boilers and auxiliaries where any power supplies necessary for engine operation are also protected to a similar level as the starting arrangements.

3 Where there is no emergency generator installed or an emergency generator does not comply with regulation II-1/44, the arrangements for bringing main and auxiliary machinery into operation should be such that the initial charge of starting air or initial electrical power and any power supplies for engine operation can be developed on board ship without external aid. If for this purpose an emergency air compressor or an electric generator is required, these units should be powered by a hand-starting oil engine or a hand-operated compressor. The arrangements for bringing main and auxiliary machinery into operation should have capacity such that the starting energy and any power supplies for engine operation are available within 30 min of a dead ship condition.

3.2 SOLAS REGULATION II-1/26.11, MACHINERY INSTALLATIONS – SERVICE TANK ARRANGEMENTS

Interpretation

1 Arrangements complying with this regulation and acceptable "equivalent arrangements", for the most commonly utilized fuel systems, are shown below.

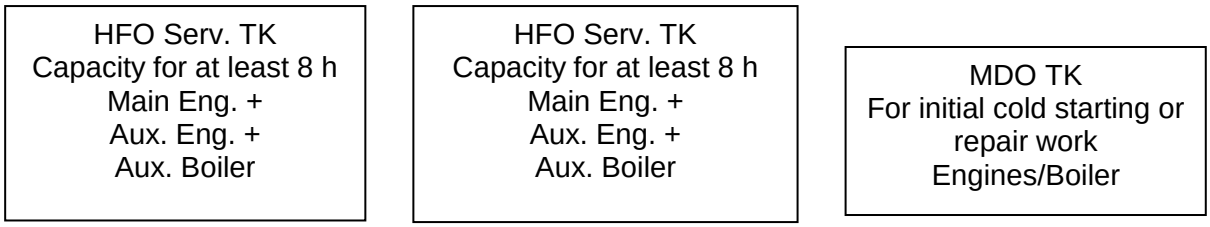
2 A service tank is a fuel oil tank which contains only fuel of a quality ready for use, i.e. fuel of a grade and quality that meets the specification required by the equipment manufacturer. A service tank should be declared as such and not be used for any other purpose.

3 Use of a setting tank with or without purifiers, or purifiers alone, and one service tank is not acceptable as an "equivalent arrangement" to two service tanks.

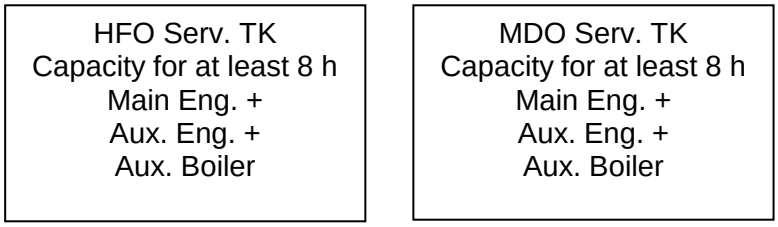
Examples of application for the most common systems

1 Example 1

1.1 Requirement according to SOLAS – Main and auxiliary engines and boiler(s) operating with heavy fuel oil (HFO) (one fuel ship)



1.2 Equivalent arrangement



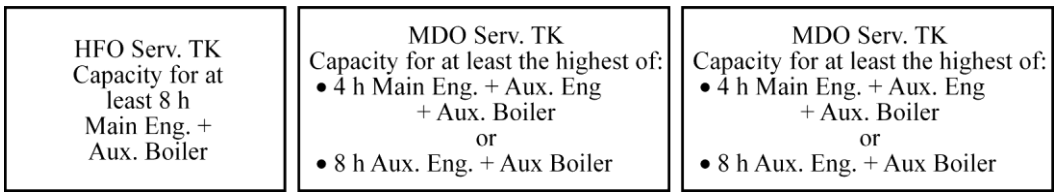
This interpretation only applies where main and auxiliary engines can operate with heavy fuel oil under all load conditions and, in the case of main engines, during manoeuvring.

For pilot burners of auxiliary boilers if provided, an additional MDO tank for eight hours may be necessary.

2 Example 2

2.1 Requirement according to SOLAS – Main engine(s) and auxiliary boiler(s) operating with HFO and auxiliary engine operating with marine diesel oil (MDO)

2.2 Equivalent arrangement



The arrangements in paragraphs 1.2 and 2.2 apply, provided the propulsion and vital systems which use two types of fuel support rapid fuel changeover and are capable of operating in all normal operating conditions at sea with both types of fuel (MDO and HFO).

4 SOLAS REGULATIONS II-1/40 – GENERAL – AND II-1/41 – MAIN SOURCE OF ELECTRICAL POWER AND LIGHTING SYSTEMS

Interpretation

Essential services and arrangements of sources of power, supply, control and monitoring to the different categories of essential services

1 Classification of essential services

1.1 Essential services are those services essential for propulsion and steering, and safety of the ship, which are made up of "Primary Essential Services" and "Secondary Essential Services". Definitions and examples of such services are given in 2 and 3 below.

1.2 Services to ensure minimum comfortable conditions of habitability are those services defined in 4 below.

2 Primary Essential Services

Primary Essential Services are those services which need to be in continuous operation to maintain propulsion and steering. Examples of equipment for "Primary Essential Services" are as follows:

- steering gears;
- pumps for controllable pitch propellers;

- scavenging air blower, fuel oil supply pumps, fuel valve cooling pumps, lubricating oil pumps and cooling water pumps for main and auxiliary engines and turbines necessary for propulsion;
- forced draught fans, feed water pumps, water circulating pumps, vacuum pumps and condensate pumps for steam plants on steam turbine ships, and also for auxiliary boilers on ships where steam is used for equipment supplying primary essential services;
- oil burning installations for steam plants on steam turbine ships and for auxiliary boilers where steam is used for equipment supplying primary essential services;
- azimuth thrusters, which are the sole means for propulsion/steering with lubricating oil pumps, cooling water pumps;
- electrical equipment for electric propulsion plant with lubricating oil pumps and cooling water pumps;
- electric generators and associated power sources supplying the above equipment;
- hydraulic pumps supplying the above equipment;
- viscosity control equipment for heavy fuel oil;
- control, monitoring, and safety devices/systems for equipment to primary essential services;
- fire pumps and other fire extinguishing medium pumps;
- navigation lights, aids and signals;
- internal safety communication equipment;
- lighting system.

3 Secondary Essential Services

Secondary Essential Services are those services which need not necessarily be in continuous operation to maintain propulsion and steering but which are necessary for maintaining the vessel's safety. Examples of equipment for secondary essential services are as follows:

- windlass;
- fuel oil transfer pumps and fuel oil treatment equipment;
- lubrication oil transfer pumps and lubrication oil treatment equipment;
- pre-heaters for heavy fuel oil;
- starting air and control air compressors;
- bilge, ballast and heeling pumps;
- ventilating fans for engine and boiler rooms;
- services considered necessary to maintain dangerous spaces in a safe condition;
- fire detection and alarm system;
- electrical equipment for watertight closing appliances;
- electric generators and associated power sources supplying the above equipment;
- hydraulic pumps supplying the above equipment;
- control, monitoring, and safety systems for cargo containment systems;
- control, monitoring, and safety devices/systems for equipment to secondary essential services.

4 Services for habitability

Services for habitability are those services which need to be in operation for maintaining the ship's minimum comfort conditions for the crew and passengers. Examples of equipment for maintaining conditions of habitability are as follows:

- cooking;
- heating;

- domestic refrigeration;
- mechanical ventilation;
- sanitary and fresh water;
- electrical generators and associated power sources supplying the above equipment.

5 Regulation II-1/40.1.1 and regulation II-1/41.1.1 – For the purposes of these regulations, the services as included in paragraphs 2 to 4 should be considered.

6 Regulation II-1/40.1.2 – For the purposes of this regulation, the services as included in paragraphs 2 and 3 and the services in regulation II-1/42 or II-1/43, as applicable, should be considered.

7 Regulation II-1/41.1.2 – For the purposes of this regulation, the services as included in paragraphs 2 to 4, except for those also listed in Interpretation 3 (SOLAS chapter II-1, regulation 41.1.2), should be considered.

8 Regulation II-1/41.1.5 – For the purposes of this regulation, the services as included in paragraphs 2, 3 and 4 should be considered[1].

9 Regulation II-1/41.5.1.2 – For the purposes of this regulation, the following interpretations are applicable:

.1 services in paragraph 2 should not be included in any automatic load shedding or other equivalent arrangements;

.2 services in paragraph 3 may be included in the automatic load shedding or other equivalent arrangement provided disconnection will not prevent services required for safety being immediately available when the power supply is restored to normal operating conditions; and

.3 services for habitability in paragraph 4 may be included in the load shedding or other equivalent arrangement.

5 SOLAS REGULATION II-1/41 – MAIN SOURCE OF ELECTRICAL POWER AND LIGHTING SYSTEMS

5.1 SOLAS REGULATION II-1/41.1.2, MAIN SOURCE OF ELECTRICAL POWER

Interpretation

Those services necessary to provide normal operational conditions of propulsion and safety do not include services such as:

.1 thrusters not forming part of the main propulsion;

.2 moorings;

.3 cargo handling gear;

.4 cargo pumps; and

.5 refrigerators for air conditioning (those which are not necessary to establish a minimum condition of habitability).

[1] See also IACS UI SC83.

5.2 SOLAS REGULATION II-1/41.1.3, SHAFT-DRIVEN GENERATOR SYSTEMS

Interpretation

Generators and generator systems, having the ship's main propulsion machinery as their prime mover, may be accepted as part of the ship's main source of electrical power, provided:

1 They should be capable of operating under all weather conditions during sailing and during manoeuvring, also when the ship is stopped, within the specified limits for the voltage variation in IEC 60092-301 and the frequency variation in IACS UR E5.

2 Their rated capacity is safeguarded during all operations given under 1, and is such that in the event of any other one of the generators failing, the services given under regulation II-1/41.1.2 (Interpretation 3) can be maintained.

3 The short circuit current of the generator/generator system is sufficient to trip the generator/generator system circuit-breaker taking into account the selectivity of the protective devices for the distribution system.

Protection should be arranged in order to safeguard the generator/generator system in case of a short circuit in the main bus bar. The generator/generator system should be suitable for further use after fault clearance.

4 Standby sets are started in compliance with paragraph 2.2 of SOLAS chapter II-1, regulation II-1/41.5 (Interpretation 5).

5.3 SOLAS REGULATION II-1/41.5.1.3, CONNECTING MEANS BY WHICH THE MAIN BUS BARS OF THE MAIN SOURCE OF ELECTRICAL POWER ARE NORMALLY CONNECTED

Interpretation

1 Other approved means can be achieved by:

.1 circuit breaker without tripping mechanism; or

.2 disconnecting link or switch by which bus bars can be split easily and safely.

2 Bolted links, for example bolted bus bar sections, should not be accepted.

5.4 SOLAS REGULATION II-1/41.5

Interpretation of paragraph 41.5.1.1

1 Where the electrical power is normally supplied by more than one generator set simultaneously in parallel operation, provision of protection, including automatic disconnection of sufficient non-essential services and if necessary secondary essential services as defined in the unified interpretation of SOLAS regulation II-1/40 and 41 above (Interpretation 2) and those provided for habitability, should be made to ensure that, in case of loss of any of these generating sets, the remaining ones are kept in operation to permit propulsion and steering and to ensure safety.

2 Where Administrations permit electrical power to be normally supplied by one generator, provision should be made, upon loss of power, for automatic starting and connecting to the main switchboard of stand-by generator(s) of sufficient capacity with automatic restarting of the essential auxiliaries, in sequential operation if required. Starting and connection to the main switchboard of one generator should be as rapid as possible, preferably within 30 minutes after loss of power. Where prime movers with longer starting time are used, this starting and connection time may be exceeded upon approval from the Administration.

Interpretation of paragraph 41.5.1.2

3 The load shedding should be automatic.

4 The non-essential services, service for habitable conditions, may be shed and, where necessary, additionally the Secondary Essential Services, sufficient to ensure the connected generator set(s) is/are not overloaded.

6 SOLAS REGULATIONS II-1/42 AND II-1/43 – EMERGENCY SOURCE OF ELECTRICAL POWER IN PASSENGER AND CARGO SHIPS

Interpretation

1 "Blackout" as used in regulations II-1/42.3.4 and II-1/43.3.4 should be understood to mean a "dead ship" condition-initiating event.

2 "Dead ship" condition, for the purpose of regulations II-1/42.3.4 and II-1/43.3.4, should be understood to mean a condition under which the main propulsion plant, boilers and auxiliaries are not in operation and in restoring the propulsion, no stored energy for starting the propulsion plant, the main source of electrical power and other essential auxiliaries should be assumed available. It is assumed that means are available to start the emergency generator at all times.

3 Emergency generator stored starting energy is not to be directly used for starting the propulsion plant, the main source of electrical power and/or other essential auxiliaries (emergency generator excluded).

4 For steam ships, the 30-min time limit given in SOLAS can be interpreted as time from blackout defined above to light-off of the first boiler.

5 Exceptionally is understood to mean conditions such as:

.1 blackout situation;

.2 dead ship situation;

.3 routine use for testing;

.4 short-term parallel operation with the main source of electrical power for the purpose of load transfer; and

.5 use of the emergency generator during lay time in port for the supply of the ship's main switchboard, provided the requirements of 6 (Suitable measures for the exceptional use of the emergency generator for power-supply of non-emergency circuits in port) are achieved and unless instructed otherwise by the Administration.

6 Suitable measures for the exceptional use of the emergency generator for power-supply of non-emergency circuits in port:

.1 To prevent the generator or its prime mover from becoming overloaded when used in port, arrangements should be provided to shed sufficient non-emergency loads to ensure its continued safe operation.

.2 The prime mover should be arranged with fuel oil filters and lubrication oil filters, monitoring equipment and protection devices as required for the prime mover for main power generation and for unattended operation.

.3 The fuel oil supply tank to the prime mover should be provided with a low-level alarm, arranged at a level ensuring sufficient fuel oil capacity for the emergency services for the period of time as required by SOLAS.

.4 The prime mover should be designed and built for continuous operation and should be subjected to a planned maintenance scheme ensuring that it is always available and capable of fulfilling its role in the event of an emergency at sea.

.5 Fire detectors should be installed in the location where the emergency generator set and emergency switchboard are installed.

.6 Means should be provided to readily change over to emergency operation.

.7 Control, monitoring and supply circuits, for the purpose of the use of emergency generator in port should be so arranged and protected that any electrical fault will not influence the operation of the main and emergency services.

.8 When necessary for safe operation, the emergency switchboard should be fitted with switches to isolate the circuits.

.9 Instructions should be provided on board to ensure that when the ship is under way all control devices (e.g. valves, switches) are in a correct position for the independent emergency operation of the emergency generator set and emergency switchboard.

7 SOLAS REGULATION II-1/44 – STARTING ARRANGEMENTS FOR EMERGENCY GENERATING SETS

7.1 SOLAS REGULATION II-1/44, PARAGRAPH 1

Interpretation (from MSC/Circ.736)

Emergency generating sets should be capable of being readily started in their cold condition at a temperature of 0ºC. If this is impracticable, or if lower temperatures are likely to be encountered, heating should be provided to ensure ready starting of the generating sets.

7.2 SOLAS REGULATION II-1/44, PARAGRAPH 2

Interpretation (from MSC/Circ.736)

Each emergency generating set arranged to be automatically started should be equipped with starting devices with a stored energy capability of at least three consecutive starts. A second source of energy should be provided for an additional three starts within 30 min unless manual starting can be demonstrated to be effective.

8 SOLAS CHAPTER II-1, PARTS B AND B-1

DOORS IN WATERTIGHT BULKHEADS OF PASSENGER SHIPS AND CARGO SHIPS

Interpretation

This interpretation pertains to doors[2] located in way of the internal watertight subdivision boundaries and the external watertight boundaries necessary to ensure compliance with the relevant subdivision and damage stability regulations.

This interpretation does not apply to doors located in external boundaries above equilibrium or intermediate waterplanes.

The design and testing requirements for watertight doors vary according to their location relative to the equilibrium waterplane or intermediate waterplane at any stage of assumed flooding.

1 DEFINITIONS

For the purpose of this interpretation the following definitions apply:

1.1 ***Watertight:*** Capable of preventing the passage of water in any direction under a design head. The design head for any part of a structure should be determined by reference to its location relative to the bulkhead deck or freeboard deck, as applicable, or to the most unfavourable equilibrium/intermediate waterplane, in accordance with the applicable subdivision and damage stability regulations, whichever is the greater. A watertight door is thus one that will maintain the watertight integrity of the subdivision bulkhead in which it is located.

1.2 ***Equilibrium waterplane:*** The waterplane in still water when, taking account of flooding due to an assumed damage, the weight and buoyancy forces acting on a ship are in balance. This relates to the final condition when no further flooding takes place or after cross flooding is completed.

1.3 ***Intermediate waterplane:*** The waterplane in still water, which represents the instantaneous floating position of a ship at some intermediate stage between commencement and completion of flooding when, taking account of the assumed instantaneous state of flooding, the weight and buoyancy forces acting on a ship are in balance.

[2] Doors in watertight bulkheads of small cargo ships, not subject to any statutory subdivision and damage stability requirements, may be hinged quick-acting doors arranged to open out of the major space protected. They should be constructed in accordance with the requirements of the Administration and have notices affixed to each side stating, "To be kept closed at sea".

1.4 ***Sliding door or rolling door:*** A door having a horizontal or vertical motion generally parallel to the plane of the door.

1.5 ***Hinged door:*** A door having a pivoting motion about one vertical or horizontal edge.

2 STRUCTURAL DESIGN

Doors and their frames should be of approved design and substantial construction in accordance with the requirements of the Administration and should preserve the strength of the subdivision bulkheads in which they are fitted.

3 OPERATION MODE, LOCATION AND OUTFITTING

Doors should be fitted in accordance with all requirements regarding their operation mode, location and outfitting, i.e. provision of controls, means of indication, etc., as shown in table 1 below. This table should be read in conjunction with paragraphs 3.1 to 5.4 below.

3.1 Frequency of use whilst at sea

3.1.1 *Normally closed:* Kept closed at sea but may be used if authorized. To be closed again after use.

3.1.2 *Permanently closed:* The time of opening such doors in port and of closing them before the ship leaves port should be entered in the logbook. Should such doors be accessible during the voyage, they should be fitted with a device to prevent unauthorized opening.

3.1.3 *Normally open:* May be left open provided it is always ready to be immediately closed.

3.1.4 *Used:* In regular use, may be left open provided it is ready to be immediately closed.

3.2 Type

Power operated, sliding or rolling[3]	POS
Power operated, hinged	POH
Sliding or rolling	S
Hinged	H

3.3 Control

3.3.1 Local

3.3.1.1 All doors, except those which should be permanently closed at sea, should be capable of being opened and closed by hand locally[4], from both sides of the doors, with the ship listed to either side.

3.3.1.2 For passenger ships, the angle of list at which operation by hand should be possible is 15º or 20º if the ship is allowed to heel up to 20º during intermediate stages of flooding.

[3] Rolling doors are technically identical to sliding doors.

[4] Arrangements for passenger ships should be in accordance with SOLAS regulation II-1/15.7.1.4.

3.3.1.3 For cargo ships, the angle of list at which operation by hand should be possible is 30º.

3.3.2 Remote

Where indicated in table 1, doors should be capable of being remotely closed by power from the bridge[5]. Where it is necessary to start the power unit for operation of the watertight door, means to start the power unit is also to be provided at remote control stations. The operation of such remote control should be in accordance with SOLAS regulations II-1/15.8.1 to 15.8.3.

3.4 Indication

3.4.1 Where shown in table 1, position indicators should be provided at all remote operating positions[6] as well as locally, on both sides of the doors[7], to show whether the doors are open or closed and, if applicable, with all dogs/cleats fully and properly engaged.

3.4.2 The door position indicating system should be of self-monitoring type and the means for testing of the indicating system should be provided at the position where the indicators are fitted.

3.4.3 An indication (i.e. red light) should be placed locally showing that the door is in remote control mode ("doors closed mode"). Refer also to SOLAS regulation II-1/15-8.1. Special care should be taken in order to avoid potential danger when passing through the door. Signboard/instructions should be placed in way of the door advising how to act when the door is in "doors closed" mode.

3.5 Alarms

3.5.1 Doors which should be capable of being remotely closed should be provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever such a door is remotely closed. For passenger ships the alarm should sound for at least 5 s but not more than 10 s before the door begins to move and should continue sounding until the door is completely closed. In the case of remote closure by hand operation, an alarm is required to sound only while the door is actually moving.

3.5.2 In passenger areas and areas of high ambient noise, the audible alarms should be supplemented by visual signals at both sides of the doors.

3.6 Notices

As shown in table 1, doors which are normally closed at sea, but are not provided with means of remote closure, should have notices fixed to both sides of the doors stating: "To be kept closed at sea". Doors which should be permanently closed at sea should have notices fixed to both sides stating: "Not to be opened at sea".

3.7 Location

For passenger ships the watertight doors and their controls should be located in compliance with SOLAS regulations II-1/15.6.3 and II-1/15.7.1.2.2.

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5 Arrangements for passenger ships should be in accordance with SOLAS regulation II-1/15.7.1.5.

6 Indication at all remote control positions (SOLAS regulation II-1/15.6.4).

7 Refer to SOLAS regulation II-1/25-9.3.

4 FIRE DOORS

4.1 Watertight doors may also serve as fire doors but need not be fire tested when intended for use below the bulkhead deck. Where such doors are used at locations above the bulkhead deck they should, in addition to complying with the provisions applicable to fire doors at the same locations, also comply with means of escape provisions of SOLAS regulation II-2/13 (2000 SOLAS amendments, resolution MSC.99(73)).

4.2 Where a watertight door is located adjacent to a fire door, both doors should be capable of independent operation, remotely if required by SOLAS regulations II-1/15.8.1 to 15.8.3 and from both sides of each door.

5 TESTING

5.1 Doors which become immersed by an equilibrium or intermediate waterplane or are below the freeboard or bulkhead deck should be subjected to a hydrostatic pressure test.

5.2 For large doors intended for use in the watertight subdivision boundaries of cargo spaces, structural analysis may be accepted in lieu of pressure testing. Where such doors utilize gasket seals, a prototype pressure test to confirm that the compression of the gasket material is capable of accommodating any deflection, revealed by the structural analysis, should be carried out.

5.3 Doors above freeboard or bulkhead deck, which are not immersed by an equilibrium or intermediate waterplane but become intermittently immersed at angles of heel in the required range of positive stability beyond the equilibrium position should be hose tested.

5.4 Pressure testing

5.4.1 The head of water used for the pressure test should correspond at least to the head measured from the lower edge of the door opening, at the location in which the door should be fitted in the ship, to the bulkhead deck or freeboard deck, as applicable, or to the most unfavourable damage waterplane, if that be greater. Testing may be carried out at the factory or other shore-based testing facility prior to installation in the ship.

5.4.2 Leakage criteria

5.4.2.1 The following acceptable leakage criteria should apply:

Doors with gaskets	No leakage
Doors with metallic sealing	Maximum leakage 1 *l*/min

5.4.2.2 Limited leakage may be accepted for pressure tests on large doors located in cargo spaces employing gasket seals or guillotine doors located in conveyor tunnels, in accordance with the following[8]:

$$\text{Leakage rate (l/min)} = \frac{(P+4.572)\, h^3}{6568}$$

where: P = perimeter of door opening (metres)
h = test head of water (metres)

5.4.2.3 However, in the case of doors where the water head taken for the determination of the scantling does not exceed 6.1 m, the leakage rate may be taken equal to 0.375 l/min if this value is greater than that calculated by the above-mentioned formula.

5.4.3 For doors of passenger ships which are normally open and used at sea and which become submerged by the equilibrium or intermediate waterplane, a prototype test should be conducted, on each side of the door, to check the satisfactory closing of the door against a force equivalent to a water height of at least 1 m above the sill on the centre line of the door[9].

5.5 Hose testing after installation

All watertight doors should be subject to a hose test[10] after installation in a ship. Hose testing should be carried out from each side of a door unless, for a specific application, exposure to floodwater is anticipated only from one side. Where a hose test is not practicable because of possible damage to machinery, electrical equipment insulation, or outfitting items, it may be replaced by means such as an ultrasonic leak test or an equivalent test.

8 Published in the ATM F 1196, Standard Specification for Sliding Watertight Door Assemblies and referenced in the Title 46 US Code of Federal Regulations 170.270 Door design, operation installation and testing.

9 Arrangements for passenger ships should be in accordance with SOLAS regulation II-1/15.6.2.

10 Refer to IACS URS 14.2.3 IACS Reg. 1996/Rev.2, 2001.

Table 1 – Internal doors in watertight bulkheads in cargo ships and passenger ships

Position relative to equilibrium or intermediate waterplane	1 Frequency of use whilst at sea	2 Type	3 Remote control[6]	4 Indication locally and on bridge[6]	5 Audible alarm[6]	6 Notice	7 Comments	8 Regulation
I. Passenger ships								
A. At or below	Normally closed	POS	Yes	Yes	Yes	No	Certain doors may be left open, see SOLAS II-1/15.9.3	SOLAS II-1/15.9.1, 15.9.2 and 15.9.3
	Permanently closed	S, H	No	No	No	Yes	See Notes 1 + 4	SOLAS II-1/15.10.1 and 15.10.2
B. Above	Normally open	POS, POH	Yes	Yes	Yes	No		SOLAS II-1/15.9.3 SOLAS II-1/20.1 MSC/Circ.541
	Normally closed	S, H	No	Yes	No	Yes	See Note 2	
		S, H	No	Yes	No	Yes	Doors giving access to ro-ro deck	SOLAS II-1/20-2
II. Cargo ships								
A. At or below	Used	POS	Yes	Yes	Yes	No		SOLAS II-1/25-9.2
	Normally closed	S, H	No	Yes	No	Yes	see Notes 2 + 3 + 5	SOLAS II-1/25-9.3
	Permanently closed	S, H	No	No	No	Yes	see Notes 1 + 4	SOLAS II-1/25-9.4 SOLAS II-1/25-10
B. Above	Used	POS	Yes	Yes	Yes	No		SOLAS II-1/25-9.2
	Normally closed	S, H	No	Yes	No	Yes	See Notes 2 + 5	SOLAS II-1/25-9.3 SOLAS II-1/25-10

Notes:

1 Doors in watertight bulkheads subdividing cargo spaces.
2 If hinged, this door should be of quick-acting or single-action type.
3 SOLAS requires remotely operated watertight doors to be sliding doors.
4 The time of opening such doors in port and closing them before the ship leaves port should be entered in the logbook.
5 The use of such doors should be authorized by the officer of the watch.
6 Cables for control and power systems to power-operated watertight doors and their status indication should comply with the requirements of IACS UR E15.

9 SOLAS REGULATION XII/9 – REQUIREMENTS FOR BULK CARRIERS NOT BEING CAPABLE OF COMPLYING WITH REGULATION 4.3 DUE TO THE DESIGN CONFIGURATION OF THEIR CARGO HOLDS

Bulk carriers not complying with SOLAS XII/9 as of 1 January 2004

Interpretation

Bulk carriers subject to SOLAS regulation XII/9, but which have not been brought into compliance with the regulation as of 1 January 2004, should comply with SOLAS regulation XII/12 in accordance with the compliance schedule of that regulation (i.e. not later than the date of the annual, intermediate or renewal survey of the ship to be carried out after 1 July 2004, whichever comes first).

10 SOLAS REGULATION XII/12 – HOLD, BALLAST AND DRY SPACE WATER INGRESS ALARMS

When water level detectors are installed on bulk carriers in compliance with SOLAS regulation XII/12, the *Performance standards for water level detectors on bulk carriers*, annexed to resolution MSC.145(77) adopted on 5 June 2003 should be applied, taking into account the following interpretations to the paragraphs of the Performance standards.

10.1 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, PARAGRAPH 3.2.3

Interpretation

Detection equipment includes the sensor and any filter and protection arrangements for the detector installed in cargo holds and other spaces as required by SOLAS regulation XII/12.1.

10.2 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, PARAGRAPH 3.2.5

Interpretation

1 In general, the construction and type testing should be in accordance with publication IEC 60079: Electrical Equipment for Explosive Gas Atmospheres to a minimum requirement of EX(ia). Where a ship is designed only for the carriage of cargoes that cannot create a combustible or explosive atmosphere then the requirement for intrinsically safe circuitry should not be insisted upon, provided the operational instructions included in the Manual required by 4.1 of the appendix to the annex specifically exclude the carriage of cargoes that could produce a potential explosive atmosphere. Any exclusion of cargoes identified in the annex should be consistent with the ship's Cargo Book and any Certification relating to the carriage of specifically identified cargoes.

2 The maximum surface temperature of equipment installed within cargo spaces should be appropriate for the combustible dusts and/or explosive gases likely to be encountered. Where the characteristics of the dust and gases are unknown, the maximum surface temperature of equipment should not exceed 85ºC.

3 Where intrinsically safe equipment is installed, it should be of a certified safe type.

4 Where detector systems include intrinsically safe circuits, plans of the arrangements should be appraised/approved by individual classification societies.

10.3 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, PARAGRAPH 3.3.2

Interpretation

The pre-alarm, as a primary alarm, should indicate a condition that requires prompt attention to prevent an emergency condition and the main alarm, as an emergency alarm should indicate that immediate actions must be taken to prevent danger to human life or to the ship.

10.4 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, PARAGRAPH 3.3.7

Interpretation

Fault monitoring should address faults associated with the system that include open circuit, short circuit, as well as arrangement details that would include loss of power supplies and CPU failure for computer based alarm/monitoring system, etc.

10.5 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, PARAGRAPH 3.3.8

Interpretation

1 The electrical power supply should be from two separate sources, one should be the main source of electrical power and the other should be the emergency source, unless a continuously charged dedicated accumulator battery is fitted, having arrangement, location and endurance equivalent to that of the emergency source (18 h). The battery supply may be an internal battery in the water level detector system.

2 The changeover arrangement of supply from one electrical source to another need not be integrated into the water level detector system.

3 Where batteries are used for the secondary power supply, failure alarms for both power supplies should be provided.

10.6 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, FOOTNOTE TO PARAGRAPH 3.4.1

Interpretation

1 IACS UR E10 may be used as an equivalent test standard to IEC 60092-504.

2 The range of tests should include the following:

For alarm/monitoring panel:

.1 functional tests in accordance with resolution MSC.145(77) – *Performance standards for water level detectors on bulk carriers*;

.2 electrical power supply failure test;

.3 power supply variation test;

.4 dry heat tests;

.5 damp heat tests;

.6 vibration test;

.7 EMC tests;

.8 insulation resistance test;

.9 high-voltage test; and

.10 static and dynamic inclinations tests, if moving parts are contained.

For IS barrier unit, if located in the wheelhouse: in addition to the certificate issued by a competent independent testing laboratory, EMC tests should also be carried out.

For water ingress detectors:

.1 functional tests in accordance with resolution MSC.145(77) – *Performance standards for water level detectors on bulk carriers*;

.2 electrical power supply failure test;

.3 power supply variation test;

.4 dry-heat test;

.5 damp-heat test;

.6 vibration test;

.7 enclosure class in accordance with resolution MSC.145(77) – *Performance standards for water level detectors on bulk carriers*;

.8 insulation resistance test;

.9 high-voltage test; and

.10 static and dynamic inclinations tests (if the detectors contain moving parts).

10.7 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, APPENDIX, PARAGRAPH 2.1.1

Interpretation

The test procedure should satisfy the following criteria:

.1 the type tests should be witnessed by a classification society surveyor if the tests are not carried out by a competent independent test facility;

.2 type tests should be carried out on a prototype or randomly selected item(s) which are representative of the manufactured item that is being type tested; and

.3 type tests should be documented (type test reports) by the manufacturer and submitted for review by classification societies.

10.8 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, APPENDIX, PARAGRAPH 2.1.1.1

Interpretation

1 The submerged test period for electrical components intended to be installed in ballast tanks and cargo tanks used as ballast tanks should be not less than 20 days.

2 The submerged test period for electrical components intended to be installed in dry spaces and cargo holds not intended to be used as ballast tanks should be not less than 24 h.

3 Where a detector and/or cable connecting device (e.g. junction box, etc.) is installed in a space adjacent to a cargo hold (e.g. lower stool, etc.) and the space is considered to be flooded under damage stability calculations, the detectors and equipment should satisfy the requirements of IP68 for a water head equal to the hold depth for a period of 20 days or 24 h on the basis of whether or not the cargo hold is intended to be used as a ballast tank as described in the previous paragraphs.

10.9 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, APPENDIX, PARAGRAPH 2.1.1.2

Interpretation

1 The type test required for the sensor should be in accordance with the following:

.1 The test container for the cargo/water mixture should be dimensioned so that its height and volume are such that the sensor and any filtration fitted can be totally submerged for the repeated functionality tests required by paragraph 2.1.1.2 and the static and dynamic inclination tests identified in the previous interpretation.

.2 The sensor and any filtration fitted that should be submerged and should be arranged in the container as they would be installed in accordance with the installation instructions required by paragaph 4.4.

.3 The pressure in the container for testing the complete detector should be not more than 0.2 bar at the sensor and any filter arrangement. The pressure may be realized by pressurization or by using a container of sufficient height.

.4 The cargo/water mixture should be pumped into the test container and suitable agitation of the mixture provided to keep the solids in suspension. The effect of pumping the cargo/water mixture into the container should not affect the operation of the sensor and filter arrangements.

.5 The cargo/water mixture should be pumped into the test container to a predetermined level that submerges the detector and the operation of the alarm observed.

.6 The test container should then be drained and the deactivation of the alarm condition observed.

.7 The test container and sensor with any filter arrangement should be allowed to dry without physical intervention.

.8 The test procedure should be repeated consecutively ten times without cleaning any filter arrangement that may be fitted in accordance with the manufacturer's installation instructions (see also 2.1.1.2).

.9 Satisfactory alarm activation and deactivation at each of the 10 consecutive tests will demonstrate satisfactory type testing.

2 The cargo/water mixture used for type testing should be representative of the range of cargoes within the following groups and should include the cargo with the smallest particles expected to be found from a typical representative sample:

.1 iron ore particles and seawater;

.2 coal particles and seawater;

.3 grain particles and seawater; and

.4 aggregate (sand) particles and seawater.

The smallest and largest particle size together with the density of the dry mixture should be ascertained and recorded. The particles should be evenly distributed throughout the mixture. Type testing with representative particles will in general qualify all types of cargoes within the four groupings shown above.

The following provides guidance on the selection of particles for testing purposes:

.1 Iron ore particles should mainly consist of small loose screenings of iron ore and not lumps of ore (dust with particle size <0.1 mm).

.2 Coal particles should mainly consist of small loose screenings of coal and not lumps of coal (dust with particle size <0.1 mm).

.3 Grain particles should mainly consist of small loose grains of free-flowing grain (grain having a size >3 mm, such as wheat).

.4 Aggregate particles should mainly consist of small loose grains of free-flowing sand and without lumps (dust with particle size <0.1 mm).

10.10 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, APPENDIX, PARAGRAPH 3.1.1

Interpretation

The test procedure should satisfy the following criteria:

.1 The type tests should be witnessed by a classification society surveyor if the tests are not carried out by a competent independent test facility.

.2 Type tests should be carried out on a prototype or randomly selected item(s) which are representative of the manufactured item that is being type tested.

.3 Type tests should be documented (type test reports) by the manufacturer and submitted for review by classification societies.

10.11 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS, APPENDIX, SECTION 4 – MANUALS

Interpretation

For each ship, a copy of the manual should be made available to the surveyor at least 24 hours prior to survey of the water-level detection installation. Each classification society should ensure that any plans required for classification purposes have been appraised/approved as appropriate.

11 SOLAS REGULATION XII/13 – AVAILABILITY OF PUMPING SYSTEMS

SOLAS regulation XII/13.1 and MSC/Circ.1069

Dewatering of forward spaces of bulk carriers

Interpretation

1 Where the piping arrangements for dewatering closed dry spaces are connected to the piping arrangements for the drainage of water ballast tanks, two non-return valves should be provided to prevent the ingress of water into dry spaces from those intended for the carriage of water ballast. One of these non-return valves should be fitted with a shut-off isolation arrangement. The non-return valves should be located in readily accessible positions. The shut-off isolation arrangement should be capable of being controlled from the navigation bridge, the propulsion machinery control position or enclosed space which is readily accessible from the navigation bridge or the propulsion machinery control position without travelling exposed freeboard or superstructure decks. In this context, a position which is accessible via an under-deck passage, a pipe trunk or other similar means of access should not be taken as being in the "readily accessible enclosed space".

2 Under SOLAS regulation XII/13.1:

.1 the valve specified under SOLAS regulation II-1/12.5.1 should be capable of being controlled from the navigation bridge, the propulsion machinery control position or enclosed space which is readily accessible from the navigation bridge or the propulsion machinery control position without travelling exposed freeboard or superstructure decks. In this context, a position which is accessible via an under-deck passage, a pipe trunk or other similar means of access should not be taken as being in the "readily accessible enclosed space";

.2 the valve should not move from the demanded position in the case of failure of the control system power or actuator power;

.3 positive indication should be provided at the remote control station to show that the valve is fully open or closed; and

.4 local hand-powered valve operation from above the freeboard deck, as permitted under SOLAS regulation II-1/12.5.1, is required. An acceptable alternative to such arrangement may be remotely operated actuators as specified in SOLAS regulation XII/13.1, on the condition that all of the provisions of regulation 13.1 are met.

3 The dewatering arrangements should be such that any accumulated water can be drained directly by a pump or eductor.

4 The dewatering arrangements should be such that when they are in operation, other systems essential for the safety of the ship including fire-fighting and bilge systems remain available and ready for immediate use. The systems for normal operation of electric power supplies, propulsion and steering should not be affected by the operation of the dewatering systems. It should also be possible to immediately start fire pumps and have a readily available supply of fire-fighting water and to be able to configure and use the bilge system for any compartment when the dewatering system is in operation.

5 Bilge wells should be provided with gratings or strainers that will prevent blockage of the dewatering system with debris.

6 The enclosures of electrical equipment for the dewatering system installed in any of the forward dry spaces should provide protection to IPX8 standard as defined in publication IEC 60529 for a water head equal to the height of the space in which the electrical equipment is installed for a time duration of at least 24 h.

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MSC.1/Circ.1465
24 June 2013

UNIFIED INTERPRETATIONS OF THE PERFORMANCE STANDARD FOR PROTECTIVE COATINGS FOR DEDICATED SEAWATER BALLAST TANKS IN ALL TYPES OF SHIPS AND DOUBLE-SIDE SKIN SPACES OF BULK CARRIERS (RESOLUTION MSC.215(82))

1 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), with a view to ensuring a uniform approach towards the application of the provisions of the *Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers* (resolution MSC.215(82)); and following the recommendation made by the Sub-Committee on Ship Design and Equipment, at its fifty-seventh session, approved unified interpretations for the above Performance standard, as set out in the annex. The unified interpretations in the annex revise and supersede the unified interpretations of the Performance standard approved by the Committee as MSC.1/Circ.1378.

2 Member Governments are invited to use the annexed unified interpretations when applying the relevant provisions of the Performance standard and to bring them to the attention of all parties concerned.

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ANNEX

UNIFIED INTERPRETATIONS OF THE PERFORMANCE STANDARD FOR PROTECTIVE COATINGS FOR DEDICATED SEAWATER BALLAST TANKS IN ALL TYPES OF SHIPS AND DOUBLE-SIDE SKIN SPACES OF BULK CARRIERS (RESOLUTION MSC.215(82))

PSPC 2 – DEFINITIONS

"*2.6 "GOOD" condition is the condition with minor spot rusting as defined in resolution A.744(18)*."

Interpretation

1 GOOD: Condition with spot rusting on less than 3 per cent of the area under consideration without visible failure of the coating. Rusting at edges or welds should be on less than 20 per cent of edges or weld lines in the area under consideration.

2 Coating Technical File: A term used for the collection of documents describing issues related to the coating system and its application from the point in time when the first document is provided and for the entire life of the ship including the inspection agreement and all elements of PSPC 3.4.

PSPC 3 – GENERAL PRINCIPLES

"*3.2 Inspection of surface preparation and coating processes shall be agreed upon between the shipowner, the shipyard and the coating manufacturer and presented to the Administration for review. The Administration may, if it so requires, participate in the agreement process. Clear evidence of these inspections shall be reported and be included in the Coating Technical File (CTF) (see 3.4)*."

Interpretation

1 Inspection of surface preparation and coating processes agreement should be signed by shipyard, shipowner and coating manufacturer and should be presented by the shipyard to the Administration for review prior to commencement of any coating work on any stage of a new building and as a minimum should comply with the PSPC.

2 To facilitate the review, the following from the CTF should be available:

.1 Coating specification including selection of areas (spaces) to be coated, selection of coating system, surface preparation and coating process.

.2 Statement of Compliance or Type Approval of the coating system.

3 The agreement should be included in the CTF and should at least cover:

.1 inspection process, including scope of inspection, who carries out the inspection, the qualifications of the coating inspector(s) and appointment of a qualified coating inspector (responsible for verifying that the coating is applied in accordance with the PSPC). Where more than one coating inspector will be used then their areas of responsibility should be identified (for example, multiple construction sites); and

.2 language to be used for documentation.

4 Any deviations in the procedure relative to the PSPC noted during the review should be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

5 A Passenger Ship Safety Certificate or Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, should not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

"*3.4* ***Coating Technical File***

3.4.1 Specification of the coating system applied to the dedicated seawater ballast tanks and double-side skin spaces, record of the shipyard's and shipowner's coating work, detailed criteria for coating selection, job specifications, inspection, maintenance and repair shall be documented in the Coating Technical File (CTF), and the Coating Technical File shall be reviewed by the Administration.

3.4.2 New construction stage
...

3.4.3 In-service maintenance, repair and partial recoating

In-service maintenance, repair and partial recoating activities shall be recorded in the Coating Technical File in accordance with the relevant section of the Guidelines for coating maintenance and repair.

3.4.4 Recoating

If a full recoating is carried out, the items specified in 3.4.2 shall be recorded in the Coating Technical File.

3.4.5 The Coating Technical File shall be kept on board and maintained throughout the life of the ship."

Interpretation

Procedure for Coating Technical File Review

1 The shipyard is responsible for compiling the Coating Technical File (CTF) either in paper or electronic format, or a combination of the two.

2 The CTF should contain all the information required by the PSPC 3.4 and the inspection of surface preparation and the coating processes agreement (see PSPC 3.2).

3 The CTF should be reviewed for content in accordance with the PSPC 3.4.2.

4 Any deviations found under paragraph 3 should be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

5 A Passenger Ship Safety Certificate or Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, should not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

"*3.5 **Health and safety***

The shipyard is responsible for implementation of national regulations to ensure the health and safety of individuals and to minimize the risk of fire and explosion."

Interpretation

In order to document compliance with PSPC 3.5, relevant documentation from the coating manufacturer concerning health and safety aspects such as Material Safety Data Sheet is recommended to be included in the CTF for information.

PSPC 4 – COATING STANDARD

"*4.3 **Special application***

4.3.1 This Standard covers protective coating requirements for the ship's steel structure. It is noted that other independent items are fitted within the tanks to which coatings are applied to provide protection against corrosion.

4.3.2 It is recommended that this Standard is applied, to the extent possible, to those portions of permanent means of access provided for inspection not integral to the ship's structure, such as rails, independent platforms, ladders, etc. Other equivalent methods of providing corrosion protection for the non-integral items may also be used, provided they do not impair the performance of the coatings of the surrounding structure. Access arrangements that are integral to the ship structure, such as increased stiffener depths for walkways, stringers, etc. are to fully comply with this Standard.

4.3.3 It is also recommended that supports for piping, measuring devices, etc. be coated in accordance with the non-integral items indicated in 4.3.2."

Interpretation

Reference is made to MSC/Circ.1279, *Guidelines for corrosion protection of permanent means of access arrangements*, approved by MSC 84 in May 2008.

PSPC 4 – TABLE 1: FOOTNOTES OF STANDARDS

"*Footnotes:*

5 Type of gauge and calibration in accordance with SSPC-PA2:2004. Paint Application Specification No.2.

6 Reference standard: ISO 8501-1:1988/Suppl:1994. Preparation of steel substrate before application of paints and related products – Visual assessment of surface cleanliness.

7 Reference standard: ISO 8503-1/2:1988. Preparation of steel substrate before application of paints and related products – Surface roughness characteristics of blast-cleaned steel substrates.

8 Conductivity measured in accordance with ISO 8502-9:1998. Preparation of steel substrate before application of paints and related products – Test for the assessment of surface cleanliness.

9 Reference standard: ISO 8501-3:2001 (grade P2). Preparation of steel substrate before application of paints and related products – Visual assessment of surface cleanliness (referred to in 3.1).

10 Reference standard: ISO 8502-3:1993. Preparation of steel substrate before application of paints and related products – Test for the assessment of surface cleanliness (referred to in 3.5)."

Interpretation

Only the footnoted standards referred to in PSPC table 1 are to be applied.

PSPC 4 – TABLE 1: 1 DESIGN OF COATING SYSTEM

"*1.3 Coating pre-qualification test*

Epoxy-based systems tested prior to the date of entry into force of this Standard in a laboratory by a method corresponding to the test procedure in annex 1 or equivalent, which as a minimum meets the requirements for rusting and blistering; or which have documented field exposure for five years with a final coating condition of not less than "GOOD" may be accepted.

For all other systems, testing according to the procedure in annex 1, or equivalent, is required."

Interpretation

Procedure for Coating System Approval

1 A Type Approval Certificate showing compliance with the PSPC 5 should be issued if the results of either method A+D, or B+D, or C+D are found satisfactory by the Administration.

2 The Type Approval Certificate should indicate the product and the shop primer tested. The certificate should also indicate other type approved shop primers with which the product may be used which have undergone the crossover test in a laboratory meeting the requirements in Method A, 1.1 of this UI.

3 The documents required to be submitted are identified in the following sections, in addition for all type approvals the following documentation is required: Technical Data Sheet showing all the information required by PSPC 3.4.2.2.

4 Winter type epoxy requires separate pre-qualification tests, including a shop primer compatibility test according to PSPC annex 1. Winter and summer type coating are considered different unless Infrared (IR) identification and Specific Gravity (SG) demonstrate that they are the same.

Method A: Laboratory test

1 A coating pre-qualification test should be carried out by a test laboratory recognized by the Administration and the test laboratory should meet the requirements set out in IACS UR Z17.

2 For the coating pre-qualification test, the measured average dry film thickness (DFT) on each prepared test panels should not exceed a nominal DFT (NDFT) of 320 microns plus 20 per cent unless a paint manufacturer specifies a NDFT greater than 320 microns. In the latter case, the average DFT should not exceed the specified NDFT plus 20 per cent and the coating system should be certified to the specified NDFT if the system passes the tests according to annex 1 of resolution MSC.215(82). The measured DFT should meet the "90/10" rule and the maximum DFT should always be below the maximum DFT value specified by the manufacturer.

3 Results from satisfactory pre-qualification tests (PSPC table 1: 1.3) of the coating system should be documented and submitted to the Administration.

4 Type Approval tests should be carried out for the epoxy-based system with the stated shop primer in accordance with PSPC, annex 1. If the tests are satisfactory, a Type Approval Certificate should be issued to include both the epoxy and the shop primer. The Type Approval Certificate will allow the use of the epoxy either with the named shop primer or on bare prepared steel.

5 An epoxy-based system may be used with shop primers other than the one with which it was originally tested provided that the other shop primers are approved as part of a system (PSPC table 1: 2.3 and table 1: 3.2) and have been tested according to PSPC annex 1, appendix 1, 1.7, which is known as the "crossover test". If the test or tests are satisfactory, a Type Approval Certificate should be issued. In this instance, the Type Approval Certificate should include the details of the epoxy and a list of all shop primers with which it has been tested that have passed these requirements. The Type Approval Certificate will allow the use of the epoxy with all the named shop primers or on bare prepared steel.

6 Alternatively, the epoxy can be tested without shop primer on bare prepared steel to the requirements of the PSPC, annex 1. If the test or tests are satisfactory, a Type Approval Certificate should be issued. The Type Approval Certificate should just record the epoxy. The certificate will allow the use of the epoxy on bare prepared steel only. If, in addition, crossover tests are satisfactorily carried out with shop primers which are approved as part of a system, the Type Approval Certificate should include the details of shop primers which have satisfactorily passed the crossover test. In this instance, the Type Approval Certificate will allow the use of the epoxy-based system with all the named shop primers or on bare prepared steel.

7 The Type Approval Certificate is invalid if the formulation of either the epoxy or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method B: five years' field exposure

1 Coating manufacturer's records, which should at least include the information indicated in paragraph 2, should be examined to confirm that the coating system had five years' field exposure and that the current product is the same as that being assessed.

2 Manufacturer's records:

- original application records;
- original coating specification;
- original technical data sheet;

- current formulation's unique identification (code or number);
- if the mixing ratio of base and curing agent has changed, a statement from the coating manufacturer confirming that the composition mixed product is the same as the original composition. This should be accompanied by an explanation of the modifications made;
- current technical data sheet for the current production site;
- SG and IR identification of original product;
- SG and IR identification of the current product; and
- if original SG and IR cannot be provided, then a statement from the coating manufacturer confirming the readings for the current product are the same as those of the original.

3 Either class survey records from an Administration or a joint (coating manufacturer and Administration) survey of all ballast tanks of a selected ship should be carried out for the purpose of verification of compliance with the requirements of paragraphs 1 and 7. The reporting of the coating condition in both cases should be in accordance with IACS Recommendation 87, section 2.

4 The selected ship should have ballast tanks in regular use, of which:

- at least one tank is approximately 2,000 m^3 or more in capacity;
- at least one tank should be adjacent to a heated tank; and
- at least one tank contains an under-deck exposed to the sun.

5 In the case that the selected ship does not meet the requirements in 4, then the limitations should be clearly stated on the Type Approval Certificate. For example, the coating cannot be used in tanks adjacent to heated tanks or under-deck or tanks with a volume greater than the size surveyed.

6 In all cases of approval by Method B, the shop primer should be removed prior to application of the approved epoxy-based system coating, unless it can be confirmed that the shop primer applied during construction is identical in formulation to that applied in the selected ship used as a basis for the approval.

7 All ballast tanks should be in "GOOD" condition excluding mechanical damages, without touch up or repair in the prior five years.

8 "Good" is defined as: *Condition with spot rusting on less than 3 per cent of the area under consideration without visible failure of the coating. Rusting at edges or welds, must be on less than 20 per cent of edges or welds in the area under consideration.*

9 Examples of how to report coating conditions with respect to areas under consideration should be as those given in IACS Recommendation 87.

10 If the applied NDFT is greater than required by the PSPC, the applied NDFT will be the minimum to be applied during construction. This should be reported prominently on the Type Approval Certificate.

11 If the results of the inspection are satisfactory, a Type Approval Certificate should be issued to include both the epoxy-based system and the shop primer. The Type Approval Certificate should allow the use of the epoxy-based system either with the named shop primer or on bare prepared steel. The Type Approval Certificate should reference the inspection report which should also form part of the Coating Technical File.

12 The Type Approval Certificate is invalid if the formulation of either the epoxy-based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method C: Existing Marintek B1 approvals

1 Epoxy-based system coatings systems with existing satisfactory Marintek test reports minimum level B1 including relevant IR identification and SG, issued before 8 December 2006 can be accepted. If original SG and IR documentation cannot be provided, then a statement should be provided by the coating manufacturer, confirming that the readings for the current product are the same as those of the original.

2 The Marintek test report with IR and SG information should be reviewed and, if satisfactory, a Type Approval Certificate should be issued. The certificate should record the report reference and the shop primer used. The Type Approval Certificate should allow the use of the epoxy-based system either with the named shop primer, unless there is evidence to indicate that it is unsuitable, or on bare prepared steel.

3 The epoxy-based system approved by this method may be used with other shop primers if satisfactory crossover tests are carried out with shop primers which are approved as part of a system, see Method A, 4. In this instance, the Type Approval Certificate should include the details of the epoxy-based system and a list of all shop primers which have passed these requirements. The Type Approval Certificate will allow the use of the epoxy-based system with all the named shop primers or on bare prepared steel.

4 Such coatings should be applied in accordance with PSPC table 1, rather than the application conditions used during the approval test which may differ from the PSPC, unless these are more stringent than PSPC, annex 1, for example, if the NDFT is higher or high-pressure water washing and/or sweep blasting of the shop primer is used. In such cases these limiting conditions should be added to the Type Approval Certificate and should be followed during coating application in the shipyard.

5 The Type Approval Certificate is invalid if the formulation of either the epoxy-based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method D: Coating manufacturer

1 The coating/shop primer manufacturer should meet the requirements set out in IACS UR Z17, paragraphs 4, 5, 6 and 7 (except for 4.6) and paragraphs 2 to 7 below, which should be verified by the Administration.

2 Coating manufacturers:

.1 Extent of engagement – Production of coating systems in accordance with PSPC and this UI.

.2 These requirements apply to both the main coating manufacturer and the shop primer manufacturer where both coatings form part of the total system.

.3 The coating manufacturer should provide to the Administration the following information:

- A detailed list of the production facilities.
- Names and location of raw material suppliers will be clearly stated.
- A detailed list of the test standards and equipment to be used (Scope of approval).
- Details of quality control procedures employed.
- Details of any subcontracting agreements.
- List of quality manuals, test procedures and instructions, records, etc.
- Copy of any relevant certificates with their issue number and/or date, e.g. Quality Management System certification.

.4 Inspection and audit of the manufacturer's facilities should be based on the requirements of the PSPC.

.5 With the exception of early "scale up" from laboratory to full production, adjustment outside the limitations listed in the QC instruction referred to below is not acceptable, unless justified by trials during the coating system's development programme, or subsequent testing. Any such adjustments must be agreed by the formulating technical centre.

.6 If formulation adjustment is envisaged during the production process, the maximum allowable limits should be approved by the formulating technical centre and clearly stated in the QC working procedures.

.7 The manufacturer's quality control system should ensure that all current production is the same formulation as that supplied for the Type Approval Certificate. Formulation change should not be permissible without testing in accordance with the test procedures in the PSPC and the issue of a Type Approval Certificate by the Administration.

.8 Batch records including all QC test results such as viscosity, specific gravity and airless spray characteristics should be accurately recorded. Details of any additions should also be included.

.9 Whenever possible, raw material supply and lot details for each coating batch should be traceable. Exceptions may be where bulk supply such as solvents and pre-dissolved solid epoxies are stored in tanks, in which case it may only be possible to record the supplier's blend.

.10 Dates, batch numbers and quantities supplied to each coating contract should be clearly recorded.

3 All raw material supply should be accompanied by the supplier's "Certificate of Conformance". The certificate should include all requirements listed in the coating manufacturer's QC system.

4 In the absence of a raw material supplier's certificate of conformance, the coating manufacturer should verify conformance to all requirements listed in the coating manufacturer's QC system.5 Drums should be clearly marked with the details as described on the Type Approval Certificate.

5 Product Technical Data Sheets should comply with all the PSPC requirements. The QC system will ensure that all Product Technical Data Sheets are current.

6 QC procedures of the originating technical centre should verify that all production units comply with the above stipulations and that all raw material supply is approved by the technical centre.

7 In the case that a coating manufacturer wishes to have products which are manufactured in different locations under the same name, then IR identification and SG should be used to demonstrate that they are the same coating, or individual approval tests will be required for the paint manufactured in each location.

8 The Type Approval Certificate is invalid if the formulation of either the epoxy-based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform class immediately of any changes to the formulation. Failure to inform class of an alteration to the formulation should lead to cancellation of the certificates for that manufacturer's products.

"*1.4 Job specification*

...

1.5 NDFT (nominal total dry film thickness)[5]

..."

Interpretation

1 Wet film thickness should be regularly checked during application for quality control by the builder. The PSPC does not state who should check WFT, it is accepted for this to be the builder. Measurement of DFT should be done as part of the inspection required in PSPC 6.

2 Stripe coats should be applied as a coherent film showing good film formation and no visible defects. The application method employed should ensure that all areas that require stripe coating are properly coated by brush or roller. A roller may be used for scallops, ratholes, etc., but not for edges and welds.

PSPC 4 – TABLE 1: 2 PSP (PRIMARY SURFACE PREPARATION)

"*2. PSP (Primary Surface Preparation)*

2.1 Blasting and profile[6, 7]

Sa $2^{1}/_{2}$; with profiles between 30-75 µm

Blasting shall not be carried out when:

.1 the relative humidity is above 85 per cent; or

.2 the surface temperature of steel is less than 3°C above the dew point."

Interpretation

Checking of the steel surface cleanliness and roughness profile should be carried out at the end of the surface preparation and before the application of the primer, in accordance with the manufacturer's recommendations.

"*2.2 Water soluble salt limit equivalent to NaCl*[8]

≤ 50 mg/m^2 *of sodium chloride.*"

Interpretation

The conductivity of soluble salts should be measured in accordance with ISO 8502-6 and ISO 8502-9, and compared with the conductivity of 50 mg/m^2 NaCl. If the measured conductivity is less than or equal to, then it is acceptable. Minimum readings to be taken should be one (1) per plate in the case of manually applied shop primer. In cases where an automatic process for application of shop primer is used, there should be means to demonstrate compliance with PSPC through a Quality Control System, which should include a monthly test.

"*2.3 Shop primer*

Zinc containing inhibitor-free zinc silicate based or equivalent. Compatibility with main coating system shall be confirmed by the coating manufacturer."

Interpretation

Shop primers not containing zinc or not silicate based should be considered to be "alternative systems" and therefore equivalency should be established in accordance with section 8 of the PSPC with test acceptance criteria for "alternative systems" given in section 3.1 (right columns) of appendices 1 and 2 to annex 1 of resolution MSC.215(82).

Procedure for review of quality control of automated shop primer plants

1 It is recognized that the inspection requirements of PSPC 6.2 may be difficult to apply to an automated shop primer plant and a quality control approach would be a more practical way of enabling compliance with the requirements of PSPC.

2 As required in PSPC, it is the responsibility of the coating inspector to confirm that the quality control procedures are ensuring compliance with PSPC.

3 When reviewing the quality control for automated shop primer plants the following procedures should be included:

.1 Procedures for management of the blasting grit including measurement of salt and contamination.

.2 Procedures recording the following: steel surface temperature, relative humidity, dewpoint.

.3 Procedures for controlling or monitoring surface cleanliness, surface profile, oil, grease, dust and other contamination.

.4 Procedures for recording/measuring soluble salts.

.5 Procedures for verifying thickness and curing of the shop primer conforms to the values specified in the Technical Specification.

PSPC 4 – TABLE 1: 3 SSP (SECONDARY SURFACE PREPARATION)

"*3.2 Sa 21/2 on damaged shop primers and welds*

Sa 2 removing at least 70 per cent of intact shop primer, which has not passed a pre-qualification certified by test procedures in 1.3.

3.3 Surface treatment after erection[6]

Butts St 3 or better or Sa $2^1/_2$ where practicable. Small damages up to 2 per cent of total area: St 3. Contiguous damages over 25 m^2 or over 2 per cent of the total area of the tank, Sa $2^1/_2$ shall be applied.

Coating in overlap shall be feathered.

3.4 In case of full or partial blasting 30-75 µm, otherwise as recommended by the coating manufacturer."

Interpretation

Usually, the fillet welding on tank boundary watertight bulkhead is left without coating on block stage (because not yet been leakage tested), in which case it can be categorized as erection joint ("butt") to be power tooled to St 3.

"*3.6 Water soluble salts limit equivalent to NaCl after blasting/grinding*[8]

≤ 50 mg/m^2 of sodium chloride."

Interpretation

1 The conductivity of soluble salts is measured in accordance with ISO 8502-6 and ISO 8502-9, and compared with the conductivity of 50 mg/m^2 NaCl. If the measured conductivity is less than or equal to, then it is acceptable.

2 All soluble salts have a detrimental effect on coatings to a greater or lesser degree. ISO 8502-9:1998 does not provide the actual concentration of NaCl. The percentage NaCl in the total soluble salts will vary from site to site. Minimum readings to be taken should be one (1) reading per block/section/unit prior to applying.

PSPC 4 – TABLE 1: 4 MISCELLANEOUS

"*4.3 Testing of coating*[5]

Destructive testing shall be avoided. Dry film thickness shall be measured after each coat for quality control purpose and the total dry film thickness shall be confirmed after completion of final coat, using appropriate thickness gauges (see annex 3)."

Interpretation

All DFT measurements should be measured. Only the final DFT measurements need to be measured and reported for compliance with the PSPC by the qualified coating inspector. The Coating Technical File may contain a summary of the DFT measurements which typically will consist of minimum and maximum DFT measurements, number of measurements taken and percentage above and below required DFT. The final DFT compliance with the 90/10 practice should be calculated and confirmed, see PSPC 2.8.

PSPC 5 – COATING SYSTEM APPROVAL

"*Results from pre-qualification tests (table 1, paragraph 1.3) of the coating system shall be documented and a Statement of Compliance or Type Approval Certificate shall be issued if found satisfactory by a third party, independent of the coating manufacturer*."

Interpretation

See Interpretation of PSPC table 1: 1 Design of coating system, 1.3 Coating pre-qualification test.

PSPC 6 – COATING INSPECTION REQUIREMENTS

"*6.1 General*

6.1.1 To ensure compliance with this Standard, the following shall be carried out by qualified coating inspectors certified to NACE Coating Inspector Level 2, FROSIO Inspector Level III or equivalent as verified by the Administration.

6.1.2 Coating inspectors shall inspect surface preparation and coating application during the coating process by carrying out, as a minimum, those inspection items identified in section 6.2 to ensure compliance with this Standard. Emphasis shall be placed on initiation of each stage of surface preparation and coatings application as improper work is extremely difficult to correct later in the coating progress. Representative structural members shall be non-destructively examined for coating thickness. The inspector shall verify that appropriate collective measures have been carried out.

6.1.3 Results from the inspection shall be recorded by the inspector and shall be included in the CTF (refer to annex 2 (Example of daily log and non-conformity report))."

Interpretation

Procedure for assessment of coating inspectors' qualifications

1 Coating inspectors required to carry out inspections in accordance with the PSPC 6 should be qualified to NACE Coating Inspector Level 2, FROSIO Inspector Level III, or an equivalent qualification. Equivalent qualifications are described in paragraph 3 below.

2 However, only coating inspectors with at least 2 years' relevant coating inspector experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification, can write and/or authorize procedures, or decide upon corrective actions to overcome non-compliances.

3 Equivalent qualification

3.1 Equivalent qualification is the successful completion, as determined by the course tutor, of an approved course.

3.2 The course tutors should be qualified with at least 2 years' relevant experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification.

3.3 Approved course: A course that has a syllabus based on the issues associated with the PSPC including the following:

- Health environment and safety
- Corrosion
- Materials and design
- International standards referenced in PSPC
- Curing mechanisms
- Role of inspector
- Test instruments
- Inspection procedures
- Coating specification
- Application procedures
- Coating failures
- Pre-job conference
- MSDS and product data sheet review
- Coating technical file
- Surface preparation
- Dehumidification
- Waterjetting
- Coating types and inspection criteria
- Specialized application equipment
- Use of inspection procedures for destructive testing and non-destructive testing instruments
- Inspection instruments and test methods
- Coating inspection techniques
- Cathodic protection
- Practical exercises, case studies.

Examples of approved courses may be internal courses run by the coating manufacturers or shipyards, etc.

3.4 Such a course should have an acceptable measurement of performance, such as an examination with both theoretical and practical elements. The course and examination should be approved by the Administration.

3.5 Equivalent qualification arising from practical experience: An individual may be qualified without attending a course where it can be shown that the individual:

- has a minimum of five years' practical work experience as a coating inspector of ballast tanks during new construction within the last 10 years; and
- has successfully completed the examination given in paragraph 3.4.

4 Assistant to the coating inspectors

4.1 If the coating inspectors require assistance from other persons to perform part of the inspections, those persons should perform the inspections under the coating inspector's supervision and should be trained to the coating inspector's satisfaction.

4.2 Such training should be recorded and endorsed either by the inspector, the yard's training organization or inspection equipment manufacturer to confirm competence in using the measuring equipment and confirm knowledge of the measurements required by the PSPC.

4.3 Training records should be available for verification.

PSPC 7 – VERIFICATION REQUIREMENTS

"*The following shall be carried out by the Administration prior to reviewing the Coating Technical File for the ship subject to this Standard:*

.1 check that the Technical Data Sheet and Statement of Compliance or Type Approval Certificate comply with this Standard;

.2 check that the coating identification on representative containers is consistent with the coating identified in the Technical Data Sheet and Statement of Compliance or Type Approval Certificate;

.3 check that the inspector is qualified in accordance with the qualification standards in paragraph 6.1.1;

.4 check that the inspector's reports of surface preparation and the coating's application indicate compliance with the manufacturer's Technical Data Sheet and Statement of Compliance or Type Approval Certificate; and

.5 monitor implementation of the coating inspection requirements."

Interpretation

Procedure for verification of application of the PSPC

1 The verification requirements of PSPC 7 should be carried out by the Administration.

2 Monitoring implementation of the coating inspection requirements, as called for in PSPC 7.5 means checking, on a sampling basis, that the inspectors are using the correct equipment, techniques and reporting methods as described in the inspection procedures reviewed by the Administration.

3 Any deviations found under paragraph 2 should be raised initially with the coating inspector, who is responsible for identifying and implementing the corrective actions.

4 In the event that corrective actions are not acceptable to the Administration or in the event that corrective actions are not carried out, then the shipyard should be informed.

5 A Passenger Ship Safety Certificate or Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, should not be issued until all required corrective actions have been carried out to the satisfaction of the Administration.

PSPC ANNEX 1: TEST PROCEDURES FOR COATING QUALIFICATION FOR DEDICATED SEAWATER BALLAST TANK OF ALL TYPES OF SHIPS AND DOUBLE-SIDE SKIN SPACES OF BULK CARRIERS

Annex 1 – Footnotes of standards

"*Footnotes:*

10 Reference standard: ISO 2811-1/4:1997. Paints and varnishes. Determination of density.

11 Reference standards: ISO 4628/2:2003. Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 2. ISO 4628:2003. Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of common types of defect – Part 3: Designation of degree of rusting.

12 Nine equally distributed measuring points are used on panel's size 150 mm x 150 mm or 15 equally distributed measuring points on panel's size 200 mm x 400 mm.

13 Reference standard: ISO 4624:2002. Pull-off test for adhesion.

14 Reference standards: ASTM D4145:1983. Standard Test Method for Coating Flexibility of Prepainted Sheet.

15 Reference standard: ISO 6270-1:1998. Paints and varnishes – Determination of resistance to humidity – Part 1: Continuous condensation."

Interpretation

Only the footnoted standards referred to in PSPC annex 1 should be applied.

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MSC.1/Circ.1466
24 June 2013

UNIFIED INTERPRETATION ON FALL PREVENTER DEVICES (MSC.1/CIRC.1392 AND MSC.1/CIRC.1327)

1 The Maritime Safety Committee, at its eighty-sixth session (27 May to 5 June 2009), approved *Guidelines for the fitting and use of fall preventer devices* (FPDs) (MSC.1/Circ.1327) following the recommendations made by the Sub-Committee on Ship Design and Equipment, at its fifty-second session.

2 The Maritime Safety Committee, at its eighty-ninth session (11 to 20 May 2011), approved *Guidelines for evaluation and replacement of lifeboat release and retrieval systems* (MSC.1/Circ.1392), as per SOLAS regulation III/1.5, following the recommendations made by the Sub-Committee on Ship Design and Equipment, at its fifty-fifth session, and the Ad Hoc Working Group on Lifeboat Release Hooks (16 to 18 March 2011).

3 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), approved a unified interpretation on fall preventer devices (MSC.1/Circ.1392 and MSC.1/Circ.1327), providing guidance on the requirements for the strength and testing standards to be applied to FPDs, following the recommendations made by the Sub-Committee on Ship Design and Equipment, at its fifty-seventh session.

4 Member Governments are invited to use the annexed unified interpretation when applying the provisions of MSC.1/Circ.1392 and MSC.1/Circ.1327 and bring it to the attention of all parties concerned.

***

ANNEX

FALL PREVENTER DEVICES (MSC.1/CIRC.1392 AND CIRC.1327)

MSC.1/Circ.1392, paragraph 4, states:

"*Member Governments are strongly urged to ensure that all ships which are fitted with on-load release systems for lifeboats are equipped with fall preventer devices as per paragraph 6 of these Guidelines at the earliest opportunity.*"

MSC.1/Circ.1392, annex, paragraph 6, states:

"*On each ship, fall preventer devices in accordance with the Guidelines for the fitting and use of fall preventer devices (FPDs) (MSC.1/Circ.1327) should be employed for each existing lifeboat release and retrieval system ...*"

MSC.1/Circ.1327, paragraph 2, states:

"*The use of FPDs should be considered as an interim risk mitigation measure, only to be used in connection with existing on-load release hooks, at the discretion of the master, pending the wide implementation of improved hook designs with enhanced safety features.*"

Interpretation

1 Where locking pins are provided as an FPD, the pins should be designed so that they have a minimum factor of safety of 6 as per the LSA Code, paragraph 6.1.1.6. Where existing on-load release hooks are drilled to provide a locking pin insertion point, the strength of the hooks should continue to satisfy the relevant requirements in the LSA Code and in the *Revised recommendation on testing of life-saving appliances* (resolution MSC.81(70), part 2, paragraph 5.3.1) and should comply with the requirements of the *Guidelines for the fitting and use of fall preventer devices (FPDs)* (MSC.1/Circ.1327, paragraph 2.1). The modification of the hook in this respect should be acceptable to the manufacturer of the hook.

2 Where strops or slings with fittings (e.g. shackles) are used as an FPD, the following test requirements should be considered:

.1 environment tests as set out in resolution MSC.81(70), part 1, paragraph 1.2.1 or equivalent;

.2 tests for rot-proof, colour-fast and resistant to deterioration from exposure to sunlight and that they are not unduly affected by seawater, oil or fungal attack as set out in resolution MSC 81(70), part 1, paragraph 2.4, or equivalent;

.3 prototype test to a factor of safety of 6; and

.4 a factory acceptance test of 2.2 x SWL.

Note: The factor of safety should be based upon the SWL, which should be not less than the total weight of the lifeboat when loaded with its full complement of persons and equipment.

3 It is the responsibility of the lifeboat and davit manufacturer to confirm that the attachment eye is suitable for the use of the proposed FPD. If the lifeboat and/or davit manufacturer is no longer available, the suitability should be determined by an independent service provider.

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MSC.1/Circ.1467
24 June 2013

UNIFIED INTERPRETATION OF SOLAS REGULATION II-1/26.3

1 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), approved a unified interpretation of SOLAS regulation II-1/26.3, regarding the arrangement of fuel pumps to provide sufficient capacity for normal operation of propulsion machinery, even if one pump becomes inoperable, while using marine fuels with a sulphur content not exceeding 0.1 per cent/m/m and minimum viscosity of 2 cSt, as required in Emission Control Areas from 1 January 2015, following the recommendations made by the Sub-Committee on Ship Design and Equipment, at its fifty-seventh session.

2 Member Governments are invited to use the annexed unified interpretation when applying the requirements of SOLAS regulation II-1/26.3 and bring it to the attention of all parties concerned.

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ANNEX

FUEL PUMP ARRANGEMENT REQUIRED FOR SHIPS TO MAINTAIN NORMAL OPERATION OF PROPULSION MACHINERY WHEN OPERATING IN EMISSION CONTROL AREAS AND NON-RESTRICTED AREAS

SOLAS regulation II-I/26.3 (partially)

"*Means shall be provided whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the malfunctioning of:*

…

.4 the fuel oil supply systems for boilers or engines;

…"

Interpretation

For ships intending to use Heavy Fuel Oil (HFO) or Marine Diesel Oil (MDO) in non-restricted areas and marine fuels with a sulphur content not exceeding 0.1 per cent/m/m and minimum viscosity of 2 cSt in emission control areas, the following arrangements should be considered to be in compliance with SOLAS regulation II-I/26.3.4:

.1 in non-restricted areas, ships provided with two (2) fuel oil pumps that can each supply the fuel primarily used by the ship (i.e. HFO or MDO) in the required capacity for normal operation of the propulsion machinery; and

.2 in emission control areas one of the following configurations:

.1 fuel oil pumps as in .1, provided these are each suitable for marine fuels with a sulphur content not exceeding 0.1 per cent/m/m and minimum viscosity of 2 cSt operation at the required capacity for normal operation of propulsion machinery;

.2 when the fuel oil pumps in .1 are suitable to operate on marine fuels with a sulphur content not exceeding 0.1 per cent/m/m and minimum viscosity of 2 cSt but one pump alone is not capable of delivering marine fuels with a sulphur content not exceeding 0.1 per cent/m/m and minimum viscosity of 2 cSt at the required capacity, then both pumps may operate in parallel to achieve the required capacity for normal operation of propulsion machinery. In this case, one additional (third) fuel oil pump should be provided. The additional pump should, when operating in parallel with one of the pumps in .1, be suitable for and capable of delivering marine fuels with a sulphur content not exceeding 0.1 per cent/m/m and minimum viscosity of 2 cSt at the required capacity for normal operation of the propulsion machinery; and

.3 in addition to .1, two separate fuel oil pumps should be provided, each capable of and suitable for supplying marine fuels with a sulphur content not exceeding 0.1 per cent/m/m and minimum viscosity of 2 cSt at the required capacity for normal operation of propulsion machinery.

Notes:

1 For the purpose of this interpretation, if a marine distillate grade fuel with a different maximum sulphur content is specified by regulation for the area of operation of the ship (e.g. ECA, specific ports or local areas, etc.) then that maximum should be applied.

2 IACS UR35.4.1 (automatic start of standby pumps) applies independent of the pump arrangement for ships holding the class notation for unattended machinery space.

3 Where electrical power is required for the operation of propulsion machinery, the requirements should also be applicable for machinery for power generation when such machinery is supplied by common fuel supply pumps.

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24 June 2013

UNIFIED INTERPRETATION OF PARAGRAPH 1.1.4 OF THE LSA CODE

1 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), approved a unified interpretation of paragraph 1.1.4 of the International Life-saving Appliances (LSA) Code, concerning the greatest launching height for a free-fall lifeboat (LSA Code, as amended by resolution MSC.218(82)) relating to SOLAS regulation III/3.13, following the recommendations made by the Sub-Committee on Ship Design and Equipment, at its fifty-seventh session.

2 Member Governments are invited to use the annexed unified interpretation when applying the requirements of paragraph 1.1.4 of the LSA Code and bring it to the attention of all parties concerned.

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ANNEX

GREATEST LAUNCHING HEIGHT FOR A FREE-FALL LIFEBOAT (LSA CODE, PARAGRAPH 1.1.4)

LSA Code, paragraph 1.1.4 (Free-fall certification height):

"*Free-fall certification height is the greatest launching height for which the lifeboat is to be approved, measured from the still water surface to the lowest point on the lifeboat when the lifeboat is in the launch configuration.*"

LSA Code, section 4.7.3 (Performance requirements):

"*4.7.3.1 Each free-fall lifeboat shall make positive headway immediately after water entry and shall not come into contact with the ship after a free-fall launching against a trim of up to 10° and a list of up to 20° either way from the certification height when fully equipped and loaded …*

4.7.3.2 For oil tankers, chemical tankers and gas carriers with a final angle of heel greater than 20° calculated in accordance with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, and the recommendations of the Organization, as applicable, a lifeboat shall be capable of being free-fall launched at the final angle of heel and on the base of the final waterline of that calculation.*"

LSA Code, paragraph 6.1.1.1 (Launching and embarkation appliances):

"*With the exception of the secondary means of launching for free-fall lifeboats, each launching appliance shall be so arranged that the fully equipped survival craft or rescue boat it serves can be safely launched against unfavourable conditions of trim of up to 10° and a list of up to 20° either way …*"

LSA Code, paragraph 6.1.4.4 (Launching appliances for free-fall lifeboats):

"*The launching appliance shall be designed and arranged so that in its ready to launch position, the distance from the lowest point on the lifeboat it serves to the water surface with the ship in its lightest seagoing condition does not exceed the lifeboat's free-fall certification height, taking into consideration the requirements of paragraph 4.7.3.*"

SOLAS regulation III/3.13 (Lightest seagoing condition):

"*Lightest seagoing condition is the loading condition with the ship on even keel, without cargo, with 10 per cent stores and fuel remaining and in the case of a passenger ship with the full number of passengers and crew and their luggage.*"

Interpretation

1 The "greatest launching height" of a free-fall lifeboat should be determined based on the lightest seagoing condition as defined in SOLAS regulation III/3.13.

2 The "water surface" used in determining the distance referred to in paragraph 6.1.4.4 of the LSA Code is the waterline typically associated with the lightest seagoing condition as defined in SOLAS regulation III/3.13.

3 The trim and heel conditions in paragraph 6.1.1.1 of the LSA Code and in the phrase "taking into consideration the requirements of paragraph 4.7.3" in paragraph 6.1.4.4 of the Code should be used only to determine the ability of the lifeboat to be safely launched within the operational capabilities of the equipment and without contacting the ship under the specified conditions and not in the determination of the "greatest launching height".