

MARITIME SAFETY COMMITTEE 84th session Agenda item 24 MSC 84/24 23 May 2008 Original: ENGLISH

#### REPORT OF THE MARITIME SAFETY COMMITTEE ON ITS EIGHTY-FOURTH SESSION

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## **1** INTRODUCTION – ADOPTION OF THE AGENDA

1.1 The eighty-fourth session of the Maritime Safety Committee was held from 7 to 16 May 2008 under the chairmanship of Mr. Neil Ferrer (Philippines). The Committee Vice-Chairman, Mr. Christian Breinholt (Denmark), was also present.

1.2 The session was attended by delegations from the following Member Governments:

ALGERIA	ISRAEL
ANGOLA	ITALY
ANTIGUA AND BARBUDA	JAMAICA
ARGENTINA	JAPAN
AUSTRALIA	JORDAN
AZERBAIJAN	KENYA
BAHAMAS	KUWAIT
BAHRAIN	LATVIA
BANGLADESH	LIBERIA
BARBADOS	LIBYAN ARAB JAMAHIRIYA
BELGIUM	LITHUANIA
BELIZE	LUXEMBOURG
BOLIVIA	MALAYSIA
BRAZIL	MALTA
BULGARIA	MARSHALL ISLANDS
CAMBODIA	MAURITANIA
CANADA	MEXICO
CHILE	MOROCCO
CHINA	NAMIBIA
COLOMBIA	NETHERLANDS
CROATIA	NEW ZEALAND
CUBA	NIGERIA
CYPRUS	NORWAY
CZECH REPUBLIC	PAKISTAN
DEMOCRATIC PEOPLE'S	PANAMA
REPUBLIC OF KOREA	PAPUA NEW GUINEA
DENMARK	PERU
DOMINICA	PHILIPPINES
DOMINICAN REPUBLIC	POLAND
ECUADOR	PORTUGAL
EGYPT	QATAR
ESTONIA	REPUBLIC OF KOREA
FINLAND	ROMANIA
FRANCE	<b>RUSSIAN FEDERATION</b>
GERMANY	SAINT KITTS AND NEVIS
GHANA	SAINT VINCENT AND
GREECE	THE GRENADINES
HONDURAS	SAUDI ARABIA
ICELAND	SERBIA
INDIA	SINGAPORE
INDONESIA	SLOVENIA
IRAN (ISLAMIC REPUBLIC OF)	SOUTH AFRICA
IRELAND	SPAIN

SWEDEN SWITZERLAND SYRIAN ARAB REPUBLIC THAILAND TRINIDAD AND TOBAGO TUNISIA TURKEY TUVALU UKRAINE UNITED KINGDOM UNITED REPUBLIC OF TANZANIA UNITED STATES URUGUAY VANUATU VENEZUELA YEMEN

the following Associate Members of IMO:

HONG KONG, CHINA

FAROE ISLANDS

and the following State not Member of IMO:

COOK ISLANDS

1.3 The session was attended by a representative from the following United Nations specialized agency:

WORLD METEOROLOGICAL ORGANIZATION (WMO)

1.4 The session was also attended by observers from the following intergovernmental organizations:

INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO) EUROPEAN COMMISSION (EC) MARITIME ORGANISATION FOR WEST AND CENTRAL AFRICA (MOWCA) LEAGUE OF ARAB STATES INTERNATIONAL MOBILE SATELLITE ORGANIZATION (IMSO) MEDITERRANEAN MEMORANDUM OF UNDERSTANDING ON PORT STATE CONTROL (MED MoU) REGIONAL COOPERATION AGREEMENT ON COMBATING PIRACY AND ARMED ROBBERY AGAINST SHIPS IN ASIA (ReCAAP ISC)

and by observers from the following non-governmental organizations in consultative status:

INTERNATIONAL CHAMBER OF SHIPPING (ICS) INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO) INTERNATIONAL SHIPPING FEDERATION (ISF) INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC) INTERNATIONAL UNION OF MARINE INSURANCE (IUMI) INTERNATIONAL CHAMBER OF COMMERCE (ICC) INTERNATIONAL TRANSPORT WORKERS' FEDERATION (ITF) INTERNATIONAL ASSOCIATION OF MARINE AIDS TO NAVIGATION AND LIGHTHOUSE AUTHORITIES (IALA) INTERNATIONAL RADIO-MARITIME COMMITTEE (CIRM) COMITÉ MARITIME INTERNATIONAL (CMI) INTERNATIONAL ASSOCIATION OF PORTS AND HARBORS (IAPH) BIMCO INTERNATIONAL ASSOCIATION OF CLASSIFICATION SOCIETIES (IACS) ICHCA INTERNATIONAL (ICHCA) **OIL COMPANIES INTERNATIONAL MARINE FORUM (OCIMF)** INTERNATIONAL MARITIME PILOTS' ASSOCIATION (IMPA) INTERNATIONAL ASSOCIATION OF INSTITUTES OF NAVIGATION (IAIN) INTERNATIONAL FEDERATION OF SHIPMASTERS' ASSOCIATIONS (IFSMA) COMMUNITY OF EUROPEAN SHIPYARDS' ASSOCIATIONS (CESA) INTERNATIONAL ASSOCIATION OF INDEPENDENT TANKER OWNERS (INTERTANKO) THE INTERNATIONAL GROUP OF P&I ASSOCIATIONS (P&I CLUBS) INTERNATIONAL ROAD TRANSPORT UNION (IRU) CRUISE LINES INTERNATIONAL ASSOCIATION (CLIA) INTERNATIONAL ASSOCIATION OF DRY CARGO SHIPOWNERS (INTERCARGO) THE INSTITUTE OF MARINE ENGINEERING, SCIENCE AND **TECHNOLOGY (IMarEST)** INTERNATIONAL PARCEL TANKERS ASSOCIATION (IPTA) INTERNATIONAL SAILING FEDERATION (ISAF) THE INTERNATIONAL MARINE CONTRACTORS ASSOCIATION (IMCA) WORLD NUCLEAR TRANSPORT INSTITUTE (WNTI) INTERNATIONAL HARBOUR MASTERS' ASSOCIATION (IHMA) INTERNATIONAL BULK TERMINALS ASSOCIATION (IBTA) INTERNATIONAL CHRISTIAN MARITIME ASSOCIATION (ICMA) THE ROYAL INSTITUTION OF NAVAL ARCHITECTS (RINA) **INTERFERRY** INTERNATIONAL BUNKER INDUSTRY ASSOCIATION (IBIA) INTERNATIONAL ASSOCIATION OF MARITIME UNIVERSITIES (IAMU) INTERNATIONAL PAINT AND PRINTING INK COUNCIL (IPPIC).

1.5 The session was also attended by Mr. A.I. Chrysostomou (Cyprus), Chairman of the Marine Environment Protection Committee (MEPC). The Chairman of all Sub-Committees, except for the Chairman of the SLF Sub-Committee, were also present.

## **Opening address of the Secretary-General**

1.6 In his opening address, the Secretary-General referred to the Organization's return to its newly-refurbished Headquarters building and expressed his gratitude to Members, organizations and the Secretariat for their cooperation and understanding throughout the life of the project. He expressed special appreciation to the United Kingdom Government, for its financial contribution to the costs of the refurbishment and for its management of the project, and to the Member States and sister organizations of the United Nations System that had hosted IMO meetings scheduled to be held abroad. He emphasized the importance of the work of the Committee handling the safety of life at sea and expressed his and the Committee's sympathy and compassion to the people of Myanmar who were affected by the recent catastrophic cyclone strike. The Secretary-General then referred to the items of the Committee's agenda that were to be considered in detail by working groups (GBS, LRIT and human element), as well as to developments concerning maritime casualties and incidents, piracy and armed robbery

against ships, and the other topics under the Committee's purview. The full text of the Secretary-General's opening address is reproduced in document MSC 84/INF.14.

# Chairman's remark and statements by delegations and observers

1.7 In responding, the Chairman thanked the Secretary-General for his words and advice and stated that the Secretary-General's advice and requests would be given every consideration in the deliberation of the Committee and its working groups.

1.8 The Chairman and a large number of delegations expressed their appreciation to the Government of the United Kingdom and the Secretary-General for his successful leadership, for the refurbishing of the IMO Headquarters, and expressed appreciation to the Secretariat, as a whole, for the conduct of business as usual in spite of the difficulties and inconveniences. They also appreciated the Governments and sister institutions of the United Nations for hosting IMO meetings scheduled to take place during the refurbishment period, namely: Denmark, Germany, Kenya, Panama and Turkey, as well as UNESCO and UNON in Nairobi. The Committee associated itself, as a whole, to the Secretary-General's expression of sympathy and compassion to the nation of Myanmar following the recent catastrophic cyclone strike.

1.9 The delegation of the United Kingdom referred to the completion of the investigation of the casualty which occurred to the containership **MSC Napoli**, the report on which was published on 22 April 2008, formally submitted to the Organization and released on the website of the Marine Accident Investigation Bureau<sup>\*</sup>. Among the recommendations contained in the report, the delegation highlighted that buckling checks should be based on global hull stresses along the entire length of the hull; containers should be accurately weighed and a code of best practice for the container industry should be developed. On the latter, it was indicated that a draft code was under preparation for submission to MSC 85. In concluding its intervention, the delegation of the United Kingdom recognized that the appropriate course of action would be to follow the established procedures for the analysis of reports of investigations into casualties by the Sub-Committee on Flag State Implementation, with a view to developing recommendations to MSC 85 on this matter.

1.10 Referring to the conclusions of the report of investigation into another casualty, i.e. the loss of the anchor-handling/supply vessel **Bourbon Dolphin**, the delegation of Norway indicated that this tragic accident, having taken the lives of half of the crew and a 14-year old boy, was only explicable by the interaction of a number of unfortunate circumstances. Based on these findings, certain proposals for changes to the current regulatory system have been prepared. The delegation informed the Committee that a copy of the report of investigation in English language would be available to all delegations during MSC 84 and that it was the intention of Norway to submit a document in due course for the consideration of the Committee.

1.11 The delegation of Spain referred to the hijacking, 250 nautical miles from the Somali coastline in international waters of the Spanish tuna fishing vessel **Playa de Bakio** on 20 April 2008. While expressing its entire satisfaction with the liberation of the twenty-six members of the crew and the recovery of the vessel with the efficient intervention of the Spanish diplomacy in Madrid and in Kenya, the delegation thanked the Organization and, in particular, the Secretary-General, for the support provided, and strongly condemned all acts of piracy and armed robbery against ships. The delegation informed the Committee on the active role of Spain

<sup>\* (</sup>http://www.maib.gov.uk/cms\_resources/MSC%20Napoli.pdf). I:\MSC\84\24.doc

for the adoption of a UN resolution in the relevant meetings of the United Nations Security Council and the European Union, and offered its continued support to IMO and any other UN forum in order to eradicate this problem from the sea. In the context of the action taken by navies to suppress piracy and armed robbery against ships in waters off the coast of Somalia and, in particular the escorting of ships chartered by the World Food Programme to deliver humanitarian aid to Somalia, the Secretary-General expressed the Organization's appreciation to the delegations of Denmark, France, Germany, Italy, the Netherlands, Spain, the United Kingdom and the United States.

1.12 Having highlighted the challenge for IMSO to assume the functions of LRIT Coordinator, the Director of IMSO expressed his appreciation to the various Member States which had contributed through financial support or human resources. He stressed the urgency of securing the financial viability of the LRIT Coordinator's role as well as the system itself. He also emphasized the opportunity at this session of the Committee to invite the Member States to discuss and evaluate the tasks carried out by IMSO as LRIT Coordinator, and to clarify political, legal and technical issues related to the LRIT Coordinator's role acting on their behalf. Bearing in mind that 1 July 2008 is the date of first implementation of the system, IMSO indicated that decisions taken by the Committee at this session would allow the IMSO Assembly, at its next session in September this year, to adopt the required measures, and reaffirmed that all the IMSO Staff remain entirely dedicated to their contribution, together with IMO and all its Member States, to the timely implementation of the LRIT system.

#### Adoption of the agenda and related matters

1.13 The Committee adopted the agenda (MSC 84/1) and a provisional timetable for guidance during the session (MSC 84/1/1, annex). The agenda, as adopted, with a list of documents considered under each agenda item, is set out in document MSC 84/INF.16.

1.14 The Committee's decisions on the establishment of working and drafting groups are reflected under sections of this report covering corresponding agenda items.

## Credentials

1.15 The Committee was informed that the credentials of delegations attending the session were in due and proper form.

#### Expression of sympathy for the victims of the earthquake in China

1.16 At the opening of the meeting on Tuesday, 13 May 2008, the Secretary-General expressed the Organization's, staff and his personal condolences, sympathy and compassion for the victims of the devastating earthquake that hit the Sichuan Province in the south western region of China the day before.

1.17 He was writing to the Chinese Ambassador to express IMO's solidarity and asked the Chinese delegation to convey feelings of deep sorrow and anguish for the catastrophic event. Everyone's thoughts and prayers were with the families of the innocent victims – with those in hospital and all others in need of support and care.

1.18 He expressed the hope there would be no further quakes and that the worst was over.

1.19 The Committee joined the Secretary-General in the expression of the above sentiments.

# 2 DECISIONS OF OTHER IMO BODIES

#### Outcome of the ninety-third session of the Legal Committee

2.1 The Committee noted (MSC 84/2) the outcome of the ninety-third session of the Legal Committee relating to:

- .1 the progress on the work of the Joint IMO/ILO *ad hoc* Expert Working Group on Liability and Compensation, regarding Claims for Death, Personal Injury and Abandonment of Seafarers; and
- .2 the reconvening of the Joint IMO/ILO Working Group to monitor the implementation of the Guidelines on the basis of the terms of reference approved by the ILO Governing Body, including the addition concerning the collection of information.

#### Outcome of the twenty-fourth extraordinary session of the Council

2.2 The Committee noted (MSC 84/2/1) the outcome of the twenty-fourth extraordinary session of the Council which, *inter alia*, had:

- .1 approved, as amended, the updated Strategic Plan for the Organization (for the six-year period 2008 to 2013), together with an associated draft Assembly resolution;
- .2 approved, as amended, the updated High-level Action Plan of the Organization and priorities for the 2008-2009 biennium, together with an associated draft Assembly resolution;
- .3 noted, with satisfaction, the adoption of the Singapore Statement on Enhancement of Safety, Security and Environmental Protection in the Straits of Malacca and Singapore;
- .4 noted, in particular, the elements of the Singapore Statement relating to the measures the littoral States have already taken in an effort to enhance safety, security and environmental protection in the Straits of Malacca and Singapore and the further actions they contemplate to take in this respect;
- .5 agreed that the Organization should contribute to the implementation of the Cooperative Mechanism established by the littoral States;
- .6 authorized the Secretary-General to provide, within the Organization's cooperation with the littoral States, every assistance possible in attracting sponsors for the projects presented during the Kuala Lumpur Meeting, including promoting financial contributions for the establishment, maintenance, repair and replacement of aids to navigation in the Straits of Malacca and Singapore;
- .7 approved the report of the Committee's eighty-third session in general, and decided to transmit it, with its comments and recommendations, to the twenty-fifth session of the Assembly, in accordance with Article 21(b) of the IMO Convention;

- .8 approved the proposed draft resolution on Piracy and armed robbery against ships in waters off the coast of Somalia, annexed to document C/ES.24/12(a)/2, and decided to submit it, as amended, to the twenty-fifth regular session of the Assembly for adoption; and
- .9 approved the proposed Agreement of Cooperation between IMO and the Regional Co-operation Agreement on Combating Piracy and Armed Robbery against ships in Asia (ReCAAP ISC), for submission to the twenty-fifth regular session of the Assembly.

2.3 With reference to the protection of vital shipping lanes, the delegation of Singapore thanked the Secretariat and all the user States and other stakeholders for participating in the Singapore Meeting on the Straits of Malacca and Singapore, held in September 2007, and for the good progress made on the Cooperative Mechanism. The delegation also informed the Committee that a number of user States and other stakeholders had pledged to participate in the Cooperative Mechanism including providing substantial contributions to the Aids to Navigation Fund. In their opinion this was a positive sign for the functioning of the Cooperative Mechanism which aimed to enhance the safety of navigation and environmental protection in the Malacca Straits and it was hoped that Member States would continue to support the Cooperation Forum, where user States and stakeholders could meet and discuss such issues in the Straits of Malacca and Singapore, with the three littoral States, at the next meeting, scheduled to be held in Malaysia later this month. In this context, the delegation of Malaysia, appreciating the efforts by the Secretariat, informed the Committee that invitation for the user States and other stakeholders to attend the next meeting of the Cooperative Forum, to be held in Kuala Lumpur, were in the process of being distributed.

## Outcome of the twenty-fifth session of the Assembly

2.4 The Committee noted (MSC 84/2/2) that the twenty-fifth session of the Assembly, had noted in the context of consideration of the reports and recommendations of the Committee, the work of the Committee with regard to the amendments to safety and security-related mandatory instruments; passenger ships safety; measures to enhance maritime security; goal-based new ship construction standards; LRIT-related matters; implementation of the revised STCW Convention; the Casualty Investigation Code; illegal, unreported and unregulated fishing and related matters; capacity-building for the implementation of new measures; piracy and armed robbery against ships; role of the human element; safety of general cargo ships; formal safety assessment, as well as decisions of the Assembly, including adoption of the relevant resolutions, regarding entry into force and implementation of the 1993 Torremolinos Protocol; amendments to COLREG 1972; piracy and armed robbery against ships off the coast of Somalia; and Strategic plan for the Organization and High-level Action Plan and priorities for the 2008-2009 biennium.

2.5 The Committee, having noted that the Assembly had endorsed the course of action proposed by the Secretary-General for circulation of future consolidated audit summary report and requested the Committee and the MEPC to consider the summary report, with a view to informing the Council, in due course, of the outcome of this consideration, has dealt with the aforementioned request under agenda item 22 (Work programme).

# **Outcome of the fifty-seventh session of Marine Environment Protection Committee**

- 2.6 The Committee noted (MSC 84/2/3) the MEPC 57's outcome with regard to, *inter alia*:
  - .1 harmful aquatic organisms in ballast water;
  - .2 recycling of ships, including convening of a diplomatic conference for adoption of the convention on recycling of ships;
  - .3 prevention of air pollution from ships, in particular, the approval, subject to the Committee's concurrent decision, of the MSC/MEPC circular on Decreasing availability of halons for marine use;
  - .4 amendments to, and interpretation of, MARPOL, in particular the MEPC's request to issue an MSC/MEPC circular on interpretation of the date of the building contract (see also document MSC 84/19/1);
  - .5 identification and protection of special areas and particularly sensitive sea areas;
  - .6 MEPC's request, in the context of the MSC resolution on use of long-range identification and tracking information for safety and marine environmental protection purposes, to seek in the future, the view of the MEPC prior to adoption of similar resolutions;
  - .7 harmful anti-fouling systems in ships;
  - .8 role of the human element;
  - .9 work programmes of the BLG and FSI Sub-Committees and environment-related items in the work programmes of the DSC, NAV and DE Sub-Committees;
  - .10 approval, in the context of application of the Committees' Guidelines, of amendments to the Guidelines, subject to the Committee's concurrent decision; and
  - .11 the MEPC's request to consider the issue of reducing oil discharges in the context of the Committee's work on safety of fishing vessels.

# **3** CONSIDERATION AND ADOPTION OF AMENDMENTS TO MANDATORY INSTRUMENTS

## GENERAL

3.1 Contracting Governments to the 1974 SOLAS Convention were invited to participate in the consideration and adoption of proposed amendments to:

.1 chapters II-1, II-2, III, IV and XI-1 of, and the appendix to the Annex, to the 1974 SOLAS Convention, as amended, in accordance with the provisions of article VIII of the Convention;

- .2 the International Code of Safety for High-Speed Craft, 1994 (1994 HSC Code), in accordance with the provisions of article VIII and regulation X/1.1 of the 1974 SOLAS Convention;
- .3 the International Code of Safety for High-Speed Craft, 2000 (2000 HSC Code), in accordance with the provisions of article VIII and regulation X/1.2 of the 1974 SOLAS Convention;
- .4 the Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers (ESP Guidelines) (resolution A.744(18)), in accordance with the provisions of article VIII and regulation XI-1/2 of the 1974 SOLAS Convention; and
- .5 the International Maritime Dangerous Goods (IMDG) Code (resolution MSC.122(75)), in accordance with the provisions of article VIII and regulation VII/1.1 of the 1974 SOLAS Convention.

3.2 Contracting Governments constituting more than one third of the total of Contracting Governments to the 1974 SOLAS Convention were present during the consideration and adoption of the said amendments by the expanded Maritime Safety Committee, in accordance with articles VIII(b)(iii) and VIII(b)(iv) of the Convention.

3.3 The proposed amendments to SOLAS chapters II-1, II-2, III, IV and XI-1 of, and the appendix to the Annex to, the 1974 SOLAS Convention and to the Codes and Guidelines mandatory under the Convention were circulated, in accordance with SOLAS article VIII(b)(i), to all IMO Members and Contracting Governments to the 1974 SOLAS Convention by circular letters No.2816 of 25 October 2007 and No.2820 of 22 October 2007.

3.4 Parties to the 1988 SOLAS Protocol were invited to participate in the consideration and adoption of proposed amendments to the appendix to the Annex to the Protocol. Parties constituting more than one third of the total of Parties to the Protocol were present during the consideration and adoption of the said amendments by the expanded Maritime Safety Committee, in accordance with the provisions of articles VIII(b)(iii) and VIII(b)(iv) of the 1974 SOLAS Convention and article VI of the 1988 SOLAS Protocol.

3.5 The proposed amendments to the 1988 SOLAS Protocol were circulated in accordance with SOLAS article VIII(b)(i) and article VI(c) of the 1988 SOLAS Protocol to all IMO Members and Parties to the 1988 SOLAS Protocol by circular letter No.2817 of 25 October 2007.

3.6 The Committee was also invited to consider and adopt the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), with a view to making it mandatory under SOLAS chapter XI-1.

3.7 The Committee was further invited to consider and approve the following non-mandatory instruments in conjunction with the adoption of the amendments to the relevant aforementioned mandatory instruments referred to in paragraph 3.1:

.1 Guidelines for owners/operators on preparing for emergency towing procedures; and

.2 Guidelines for construction, maintenance and inspection of accommodation ladders and gangways.

3.8 The Committee was also invited to consider the proposed correction to the text of amendments to SOLAS chapter VI concerning material safety data sheets (MSDS), adopted at MSC 83, and take action as appropriate.

# CONSIDERATION OF THE PROPOSED AMENDMENTS TO INSTRUMENTS AND OF NEW MANDATORY STANDARDS

#### CONSIDERATION OF THE PROPOSED AMENDMENTS TO THE 1974 SOLAS CONVENTION

#### **PROPOSED AMENDMENTS TO SOLAS CHAPTER II-1**

#### **Regulation 3-4** – **Emergency towing arrangements on tankers New regulation 3-9** – **Means of embarkation on and disembarkation from ships**

3.9 The Committee recalled that the proposed amendments to SOLAS regulation II-1/3-4 and the new SOLAS regulation II-1/3-9 (MSC 84/3, annex 1) had been developed by DE 50 and approved by MSC 83.

3.10 Noting that no comments had been submitted on the aforementioned regulations, the Committee confirmed its contents, subject to editorial improvements, if any.

#### **Regulation 35-1 – Bilge pumping arrangements**

3.11 The Committee recalled that the proposed amendments to SOLAS regulations II-1/35-1 and II-2/20 (MSC 84/3, annex 1) had been developed and approved by MSC 83, to establish provisions concerning the drainage of fire-fighting water in enclosed ro-ro spaces.

3.12 Noting that the new SOLAS regulation II-1/35-1, adopted at MSC 80 (resolution MSC.194(80), annex 2), is expected to have been accepted on 1 July 2008 and to enter into force on 1 January 2009, the Committee recognized that, procedurally, the proposed amendments to regulation II-1/35-1 could not be adopted at this session.

3.13 Subsequently, the Committee agreed to adopt the proposed amendments to regulation II-1/35-1 at a future session after the entry into force of regulation II-1/35-1 and requested the Secretariat to take action as necessary.

## **PROPOSED AMENDMENTS TO SOLAS CHAPTER II-2**

#### **Regulation 10 – Fire fighting**

3.14 The Committee recalled that the proposed amendments to SOLAS regulation II-2/10 (MSC 84/3, annex 1) had been developed by FP 51 and approved by MSC 83.

3.15 Noting that no comments had been submitted on the regulation, the Committee confirmed its contents, subject to editorial improvements, if any.

# **Regulation 19 – Carriage of dangerous goods**

3.16 The Committee recalled that the proposed amendments to SOLAS regulation II-2/19 (MSC 84/3, annex 1) had been developed and approved by MSC 83.

3.17 Noting that no comments had been submitted on the regulation, the Committee confirmed its contents, subject to editorial improvements, if any.

# **Regulation 20 – Protection of vehicle, special category and ro-ro spaces**

3.18 The Committee recalled that the proposed amendments to SOLAS regulation II-2/20 (MSC 84/3, annex 1) had been developed and approved by MSC 83.

3.19 Noting that there were square brackets around the words "to the satisfaction of the Administration" in paragraphs 6.1.4.1.1, 6.1.4.1.3, 6.1.4.2 and 6.1.5 of the regulation, and recognizing that the FP Sub-Committee was currently developing the Guidelines referred to in the draft amendments, the Committee agreed to delete square brackets and the words therein.

3.20 With regard to the square brackets around the words "measures shall be taken" in paragraph 6.1.5 of the regulation, the Committee agreed that the above words should be modified to clearly indicate that the "measures" are fixed devices and not operational measures and instructed the drafting group to modify the text accordingly. In this context, the Committee, acknowledging the need to develop the Guidelines for drainage systems in closed vehicle and ro-ro spaces and special category spaces, referred to in paragraphs 6.1.4 and 6.1.5 of the regulation, by the time the amendments come into force, instructed the SLF and FP Sub-Committees to finalize the draft Guidelines for submission to MSC 86 for approval.

# PROPOSED AMENDMENTS TO SOLAS CHAPTER III

# **Regulation 6 – Communications Regulation 26 – Additional requirements for ro-ro passenger ships**

3.21 The Committee recalled that the proposed amendments to SOLAS regulations III/6 and III/26 (MSC 84/3, annex 1) had been developed by COMSAR 11 and approved by MSC 83.

3.22 Noting that no comments had been submitted on the proposed amendments to SOLAS chapter III, the Committee confirmed its contents, subject to editorial improvements, if any.

# **PROPOSED AMENDMENTS TO SOLAS CHAPTER IV**

# **Regulation 7 – Radio equipment: General**

3.23 The Committee recalled that the proposed amendments to SOLAS regulation IV/7 (MSC 84/3, annex 1) had been developed by COMSAR 11 and approved by MSC 83.

3.24 Noting that no comments had been submitted on the proposed amendments to SOLAS chapter IV, the Committee confirmed its contents, subject to editorial improvements, if any.

# PROPOSED AMENDMENTS TO SOLAS CHAPTER XI-1

# New regulation 6 – Additional requirements for the investigation of marine casualties and incidents

3.25 The Committee recalled that the proposed new SOLAS regulation XI-1/6 (MSC 84/3, annex 1) had been developed by FSI 15 and approved by MSC 83, to make the Casualty Investigation Code mandatory under the SOLAS Convention.

3.26 Having considered the proposal by the delegation of the United States, which was supported by other delegations, to adopt the new SOLAS regulation XI-1/6, making the Code mandatory, by a separate resolution, agreed to the United States' proposal and instructed the drafting group accordingly.

## **PROPOSED** AMENDMENTS TO THE APPENDIX TO THE ANNEX TO THE 1974 SOLAS CONVENTION

3.27 The Committee recalled that the proposed amendments to the appendix to the Annex to the 1974 SOLAS Convention had been developed by COMSAR 11 and approved by MSC 83.

3.28 Noting that no comments had been submitted on the proposed amendments to the appendix, the Committee confirmed its contents subject to editorial improvements, if any.

#### **D**ATE OF ENTRY INTO FORCE OF THE PROPOSED AMENDMENTS

3.29 The Committee agreed that the SOLAS amendments, proposed for adoption at the current session, should be deemed to have been accepted on 1 July 2009 and should enter into force on 1 January 2010. Consequently, the Committee instructed the drafting group to prepare the text of the draft requisite MSC resolutions for adoption (see also paragraph 3.26).

#### PROPOSED AMENDMENTS TO THE 1988 SOLAS PROTOCOL

3.30 The Committee recalled that the proposed amendments to the forms of Record of Equipment for Passenger Ship Safety Certificate (Form P), Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E), Record of Equipment for Cargo Ship Radio Certificate (Form R) and Record of Equipment for Cargo Ship Safety Certificate (Form C) contained in the appendix to the Annex to the 1988 SOLAS Protocol (MSC 84/3/1, annex) had been developed by COMSAR 11 and approved by MSC 83.

3.31 Noting that the forms of Record of Equipment for Passenger Ship Safety Certificate (Form P), Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E) and Record of Equipment for Cargo Ship Radio Certificate (Form R) contained in the appendix to the Annex to the 1974 SOLAS Convention can also be amended in line with amendments to the Records of Equipment under the 1988 SOLAS Protocol, the Committee agreed to refer the issue to the drafting group to prepare amendments to Forms P, E and R contained in the 1974 SOLAS Convention.

#### Date of entry into force of the proposed amendments

3.32 The Committee agreed that the amendments to the appendix to the Annex to the 1988 SOLAS Protocol, proposed for adoption at the current session, should be deemed to have been accepted on 1 July 2009 and should enter into force on 1 January 2010.

# PROPOSED AMENDMENTS TO MANDATORY CODES

# **PROPOSED AMENDMENTS TO THE 1994 HSC CODE**

3.33 The Committee recalled that the proposed amendments to the International Code of Safety for High-Speed Craft, 1994 (1994 HSC Code) (MSC 84/3, annex 2) had been developed by COMSAR 11 and approved by MSC 83.

3.34 Noting that no comments had been submitted on the proposed amendments to the 1994 HSC Code, the Committee confirmed its contents, subject to editorial improvements, if any.

# Date of entry into force of the proposed amendments

3.35 The Committee agreed that the amendments to the 1994 HSC Code, proposed for adoption at the current session, should be deemed to have been accepted on 1 July 2009 and should enter into force on 1 January 2010.

# **PROPOSED AMENDMENTS TO THE 2000 HSC CODE**

3.36 The Committee recalled that the proposed amendments to the International Code of Safety for High-Speed Craft, 2000 (2000 HSC Code) (MSC 84/3, annex 3) had been prepared by COMSAR 11 and approved by MSC 83.

3.37 Noting that no comments had been submitted on the proposed amendments to the 2000 HSC Code, the Committee confirmed its contents, subject to editorial improvements, if any.

# Date of entry into force of the proposed amendments

3.38 The Committee agreed that the amendments to the 2000 HSC Code, proposed for adoption at the current session, should be deemed to have been accepted on 1 July 2009 and should enter into force on 1 January 2010.

# **PROPOSED** AMENDMENTS TO RESOLUTION A. 744(18)

3.39 The Committee recalled that the proposed amendments to resolution A.744(18) (MSC 84/3, annex 4) had been developed by DE 50 and approved by MSC 83.

3.40 The Committee considered the submission by IACS (MSC 84/3/7), proposing that paragraph 5.6.2 of section 5.6 (Survey planning meeting) be modified to also permit a representative nominated by the master or Company to attend the survey planning meeting, and agreed, in principle, to the proposed modifications, taking into account the comments to make the qualification of representatives clearer by using appropriate wording.

3.41 Having noted that no further comments had been submitted on the proposed amendments to resolution A.744(18), the Committee confirmed its contents, subject to editorial improvements, if any.

## Date of entry into force of the proposed amendments

3.42 The Committee agreed that the amendments to resolution A.744(18), proposed for adoption at the current session, should be deemed to have been accepted on 1 July 2009 and should enter into force on 1 January 2010.

## **PROPOSED** AMENDMENTS TO THE IMDG CODE

3.43 The Committee recalled that the proposed amendments to the IMDG Code had been agreed by DSC 12 and had been circulated in accordance with the amendment procedure for the IMDG Code approved by MSC 75 (MSC 75/24, paragraph 7.36.3).

3.44 Having noted the concern over the words "company" or "companies" used in the proposed amendments to the IMDG Code, the Committee agreed to replace the words "company" or "companies" by the words "entity" or "entities", respectively, and, having confirmed the contents of the draft amendments, subject to editorial improvements, if any, instructed the drafting group accordingly.

## Date of entry into force of the proposed amendments

3.45 The Committee agreed that the amendments to the IMDG Code, proposed for adoption at the current session, should be deemed to have been accepted on 1 July 2009 and should enter into force on 1 January 2010, noting that the operative paragraph 4 of the draft resolution also states that Contracting Governments to the SOLAS Convention may apply the amendments in whole or in part on a voluntary basis as from 1 January 2009.

## CONSIDERATION OF A NEW MANDATORY STANDARD

## CASUALTY INVESTIGATION CODE

3.46 The Committee recalled that the draft Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code) (MSC 84/3/4, annex) had been developed by FSI 15 and approved by MSC 83, with a view to making parts I and II of the Code mandatory under SOLAS chapter XI-1 (see also paragraph 3.26).

3.47 The delegation of Turkey, having expressed their concerns on the draft Casualty Investigation Code to the effect that the reference to the United Nations Convention on the Law of the Sea (UNCLOS) in footnotes to the draft Code make it difficult for States, that are not Parties to UNCLOS, to accept the Code, therefore, proposed to include the words, e.g., "and rules of international and customary laws", in the footnotes. The Committee agreed to the proposal and instructed the drafting group to modify the draft Code accordingly.

## Effective date of the Code

3.48 The Committee agreed that the Casualty Investigation Code, proposed for adoption at the current session, should take effect on 1 January 2010, noting that the effective date should be the same as the date of entry into force of new SOLAS regulation XI-1/6, i.e., 1 January 2010.

#### CONSIDERATION OF AMENDMENT-RELATED GUIDELINES

#### **GUIDELINES FOR CONSTRUCTION, MAINTENANCE AND INSPECTION OF ACCOMMODATION LADDERS** AND GANGWAYS

3.49 The Committee recalled that the draft Guidelines (MSC 84/3/3, annex 1) had been prepared by DE 50 and approved, in principle, by MSC 83 for formal approval at this session, together with the adoption of the draft new SOLAS regulation II-1/3-9 (Means of embarkation on and disembarkation from ships).

3.50 The Committee considered document MSC 84/3/6 (Australia, Republic of Korea and IACS), proposing several amendments to the draft Guidelines, with a view to achieving consistent and complete implementation of the safety provisions prescribed in the draft new SOLAS regulation II-1/3-9, and, having recognized that the comments and modifications made would result in substantial changes to the draft Guidelines, decided not to approve the draft Guidelines at this session and instructed the DE Sub-Committee to review the draft Guidelines, taking into account the proposed amendments, and submit to MSC 86 for approval.

#### **GUIDELINES FOR OWNERS/OPERATORS ON PREPARING FOR EMERGENCY TOWING PROCEDURES**

3.51 The Committee recalled that the draft Guidelines (MSC 84/3/3, annex 2) had been prepared by DE 50 and approved, in principle, by MSC 83 for formal approval at this session, together with the adoption of the amendments to SOLAS regulation II-1/3-4 (Emergency towing arrangements on tankers).

3.52 Noting that no comments had been submitted on the draft Guidelines, the Committee confirmed its contents, subject to editorial improvements, if any.

# CONSIDERATION OF THE SUGGESTED CORRECTION TO THE TEXT OF AMENDMENTS TO SOLAS CHAPTER VI CONCERNING MATERIAL SAFETY DATA SHEETS (MSDS), ADOPTED AT MSC 83

3.53 The Committee recalled that MSC 83 had adopted amendments to SOLAS chapter VI (resolution MSC.239(83)), inserting a new regulation VI/5-1 on Material safety data sheets (MSDS), and considered document MSC 84/3/5 (Secretariat), addressing the anomaly of the text of new SOLAS regulation VI/5-1 on MSDS and proposing a course of action to rectify the anomaly.

3.54 With regard to the inclusion of the proposed modifications, which are outlined in paragraph 6 of document MSC 84/3/5, one delegation, being of the opinion that the proposed modifications constitute formal amendments, stated that they should be adopted in accordance with the amendment procedure specified in SOLAS article VIII, and did not agree to the course of action proposed by the Secretariat, although the Secretariat explained that, because the amendments adopted by resolution MSC.239(83) are in the process of authentication, the suggested course of action would not contradict the Vienna Convention, if the Committee agrees unanimously. Consequently, the Committee agreed not to proceed with the proposed rectification and to settle the matter through formal amendments.

3.55 Regarding the application of the new SOLAS regulation VI/5-1, the majority of the delegations who spoke expressed the view that MSDS should be required for ships carrying either MARPOL Annex I cargoes or bunker fuel oils, but some delegations stated that, under the

present regulation developed by the BLG Sub-Committee, MSDS need not be required for bunker fuel oil.

3.56 The Committee recalled that MSC 76 considered a proposal to require MSDS to ships carrying MARPOL Annex I cargoes or bunker fuel oils and instructed the BLG Sub-Committee to consider the proposal under the already existing work programme with a view to establishing mandatory provisions for requiring MSDS for such ships. After a lengthy discussion, the Committee agreed to further consider this matter at the next session and instructed the Secretariat to prepare:

- .1 a revised text of regulation VI/5-1 covering the proposed correction of the error suggested by the Secretariat and necessary modifications to reflect the view of the majority that MSDS should be required also for the bunker fuel oils; and
- .2 a draft MSC circular on the application of the present regulation VI/5-1,

with a view to their adoption and approval, as appropriate, at MSC 86.

3.57 In the context of paragraph 3.56, the Chairman of the BLG Sub-Committee stated that, in his opinion, BLG 8 had not been given clear instruction on this matter by the Committee.

## **ESTABLISHMENT OF A DRAFTING GROUP**

3.58 Following discussion in plenary, the Committee established an *ad hoc* drafting group to prepare the final text of the draft amendments to the 1974 SOLAS Convention, the 1994 HSC Code, the 2000 HSC Code, resolution A.744(18), the IMDG Code and the 1988 SOLAS Protocol; the draft Casualty Investigation Code; the amendment-related non-mandatory guidelines, together with the associated draft MSC resolutions and MSC circular, as appropriate, for consideration by the Committee for adoption and approval, as appropriate.

# ADOPTION OF A NEW MANDATORY INSTRUMENT AND PROPOSED AMENDMENTS TO MANDATORY AND NON-MANDATORY INSTRUMENTS

## **REPORT OF THE DRAFTING GROUP**

3.59 Having received the report of the drafting group (MSC 84/WP.3), the Committee took action as indicated hereunder.

## ADOPTION OF A NEW MANDATORY INSTRUMENT

## Adoption of the Casualty Investigation Code

3.60 The Committee considered the text of the Casualty Investigation Code prepared by the drafting group (MSC 84/WP.3, annex 8) and adopted the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), by resolution MSC.255(84), set out in annex 1.

3.61 When adopting the Casualty Investigation Code, the delegation of the United States reserved its position on the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident, because of the inclusion of

certain provisions, not directly promoting maritime safety, which create fundamental and irreconcilable conflicts with important aspects of United States domestic law.

# Adoption of the proposed amendments to the 1974 SOLAS Convention and the 1988 SOLAS Protocol

#### Adoption of amendments to the 1974 SOLAS Convention

3.62 The expanded Committee, including the delegations of 100 Contracting Governments to the 1974 SOLAS Convention considered the final text of the proposed amendments to chapters II-1, II-2, III and IV of, and to the appendix to the Annex to, the Convention prepared by the drafting group (MSC 84/WP.3, annex 1) and adopted the amendments unanimously by resolution MSC.256(84), set out in annex 2.

3.63 The expanded Committee, including the delegations of 100 Contracting Governments to the 1974 SOLAS Convention considered the final text of the proposed amendments to SOLAS chapter XI-1 prepared by the drafting group (MSC 84/WP.3, annex 2) and adopted the amendments unanimously by resolution MSC.257(84), set out in annex 3.

3.64 In adopting resolutions MSC.256(84) and MSC.257(84), the expanded Committee determined, in accordance with article VIII(b)(vi)(2)(bb) of the 1974 SOLAS Convention, that the adopted amendments to chapters II-1, II-2, III, IV and XI-1 of, and to the appendix to the Annex to, the Convention should be deemed to have been accepted on 1 July 2009 (unless, prior to that date, objections are communicated to the Secretary-General, as provided for in article VIII(b)(vi)(2) of the Convention) and should enter into force on 1 January 2010, in accordance with the provisions of SOLAS article VIII.

3.65 In this regard, the delegation of the United States stated that provisions were inserted into the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), which are not directly related to maritime safety and that those provisions create fundamental and irreconcilable conflicts with important aspects of United States domestic law. Accordingly, the delegation of the United States objected to the proposed amendment to SOLAS chapter XI-1, making the Casualty Investigation Code mandatory for certain investigations conducted by flag States.

#### Adoption of amendments to the 1988 SOLAS Protocol

3.66 The expanded Committee, including delegations of 67 Parties to the 1988 SOLAS Protocol, considered the final text of the proposed amendments to the appendix to the Annex to the Protocol prepared by the drafting group (MSC 84/WP.3, annex 3) and adopted the amendments unanimously by resolution MSC.258(84), set out in annex 4.

3.67 In adopting resolution MSC.258(84), the expanded Committee determined, in accordance with article VIII(b)(vi)(2)(bb) of the 1974 SOLAS Convention and article VI of the 1988 SOLAS Protocol, that the adopted amendments to the Protocol should be deemed to have been accepted on 1 July 2009 (unless, prior to that date, objections are communicated to the Secretary-General, as provided for in article VIII(b)(vi)(2) of the 1974 SOLAS Convention and article VI of the 1988 SOLAS Protocol) and should enter into force on 1 January 2010, in accordance with the provisions of SOLAS article VIII and article VI of the 1988 SOLAS Protocol.

## ADOPTION OF THE PROPOSED AMENDMENTS TO THE MANDATORY CODES

#### Adoption of amendments to the 1994 HSC Code

3.68 The expanded Committee, including delegations of 100 Contracting Governments to the 1974 SOLAS Convention, considered the final text of the proposed amendments to the 1994 HSC Code prepared by the drafting group (MSC 84/WP.3, annex 4) and adopted the amendments unanimously by resolution MSC.259(84), set out in annex 5.

3.69 In adopting resolution MSC.259(84), the expanded Committee determined, in accordance with article VIII(b)(vi)(2)(bb) of the 1974 SOLAS Convention, that the adopted amendments to the 1994 HSC Code should be deemed to have been accepted on 1 July 2009 (unless, prior to that date, objections are communicated to the Secretary-General, as provided for in article VIII(b)(vi)(2) of the Convention) and should enter into force on 1 January 2010, in accordance with the provisions of SOLAS article VIII.

#### Adoption of amendments to the 2000 HSC Code

3.70 The expanded Committee, including delegations of 100 Contracting Governments to the 1974 SOLAS Convention, considered the final text of the proposed amendments to the 2000 HSC Code prepared by the drafting group (MSC 84/WP.3, annex 5) and adopted the amendments unanimously by resolution MSC.260(84), set out in annex 6.

3.71 In adopting resolution MSC.260(84), the expanded Committee determined, in accordance with article VIII(b)(vi)(2)(bb) of the 1974 SOLAS Convention, that the adopted amendments to the 2000 HSC Code should be deemed to have been accepted on 1 July 2009 (unless, prior to that date, objections are communicated to the Secretary-General, as provided for in article VIII(b)(vi)(2) of the Convention) and should enter into force on 1 January 2010, in accordance with the provisions of SOLAS article VIII.

# Adoption of amendments to the Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers (resolution A.744(18))

3.72 The expanded Committee, including delegations of 100 Contracting Governments to the 1974 SOLAS Convention, considered the final text of the proposed amendments to the Guidelines (resolution A.744(18)) prepared by the drafting group (MSC 84/WP.3, annex 6) and adopted the amendments unanimously by resolution MSC.261(84), set out in annex 7.

3.73 In adopting resolution MSC.261(84), the expanded Committee determined, in accordance with article VIII(b)(vi)(2)(bb) of the 1974 SOLAS Convention, that the adopted amendments to the Guidelines should be deemed to have been accepted on 1 July 2009 (unless, prior to that date, objections are communicated to the Secretary-General, as provided for in article VIII(b)(vi)(2) of the Convention) and should enter into force on 1 January 2010, in accordance with the provisions of SOLAS article VIII.

3.74 In the context of the item, the Committee endorsed the group's recommendation that, when considering further amendments to the Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers (resolution A.744(18)), the DE Sub-Committee should take into account the inclusion, in paragraph 5.6.2 of the Guidelines, of the words "or an appropriately qualified representative appointed by the master or Company" and that:

- .1 in paragraph 1.2.6 of the Guidelines, there is no real definition of the term "transverse section"; and
- .2 in paragraph 1.2.10 of the Guidelines, the definition of the term "a corrosion prevention system" includes some requirements of soft coatings, and there is linkage between parts of the requirements therein and requirements in paragraph 5.3. Therefore, these requirements should be located in the more suitable place in the text.

#### Adoption of amendments to the IMDG Code

3.75 The expanded Committee, including delegations of 100 Contracting Governments to the 1974 SOLAS Convention, considered the final text of the proposed amendments to the IMDG Code prepared by the drafting group (MSC 84/WP.3, annex 7) and adopted the amendments unanimously by resolution MSC.262(84), set out in annex 8.

3.76 In adopting resolution MSC.262(84), the expanded Committee determined, in accordance with article VIII(b)(vi)(2)(bb) of the 1974 SOLAS Convention, that the adopted amendments to the IMDG Code should be deemed to have been accepted on 1 July 2009 (unless, prior to that date, objections are communicated to the Secretary-General, as provided for in article VIII(b)(vi)(2) of the Convention) and should enter into force on 1 January 2010, in accordance with the provisions of SOLAS article VIII.

3.77 The Committee noted that, in accordance with the procedure adopted by MSC 75 for the adoption of amendments to the IMDG Code with regard, *inter alia*, to voluntary application of new amendments one year prior to their date of entry into force, it agreed, as stated in the operative paragraph 4 of the resolution, that Contracting Governments may apply the aforementioned amendments in whole or in part on a voluntary basis from 1 January 2009, pending their entry-into-force date on 1 January 2010.

#### APPROVAL OF A NEW NON-MANDATORY IMO INSTRUMENT

3.78 The Committee considered the final text of a new non-mandatory IMO instrument prepared by the drafting group (MSC 84/WP.3, annex 9) and approved MSC.1/Circ.1255 on Guidelines for owners/operators on preparing emergency towing procedures.

3.79 The Committee, having recalled its decision with regard to the draft Guidelines for construction, maintenance and inspection of accommodation ladders and gangways (see paragraph 3.50), noted that the group had preliminarily reviewed the draft Guidelines (MSC 84/WP.3, annex 10) and endorsed the group's recommendation that the modified draft Guidelines be forwarded to the DE Sub-Committee, for appropriate action.

#### INSTRUCTIONS TO THE SECRETARIAT

3.80 In adopting the aforementioned amendments, the Committee authorized the Secretariat, when preparing the authentic texts of the amendments as appropriate, to effect any editorial corrections that may be identified, and to bring to the attention of the Committee any errors or omissions which require action by the Contracting Governments to the 1974 SOLAS Convention and the Parties to the 1988 SOLAS Protocol.

# 4 MEASURES TO ENHANCE MARITIME SECURITY

#### General

4.1 The Committee recalled that MSC 83 had agreed that maritime security should remain on the agenda for MSC 84 and MSC 85, with provision for a drafting group on maritime security at MSC 84, if required, and for the Maritime Security Working Group (MSWG) to reconvene at MSC 85.

#### Fifth special meeting of the Counter-Terrorism Committee

4.2 In considering document MSC 84/4 (Secretariat) on the report of the Fifth special meeting of the United Nations Security Council Counter-Terrorism Committee with International, Regional and Sub-Regional Organizations which provided a copy of the Joint Statement and of the associated Plan of action adopted at the end of the meeting, the Committee noted the information provided and invited SOLAS Contracting Governments to review the Plan of Action (annex to document MSC 84/4) and to submit reports on actions they have taken in relation to, and observations on, the activities listed therein as being associated with the Organization, for consideration during MSC 85.

#### National supplemental security arrangements

4.3 In considering the proposals by Turkey (MSC 84/4/2), the Committee noted the information provided on the additional national security arrangements required by Turkey for the monitoring of ships and the AIS carriage requirements for ships other than those covered by SOLAS chapter XI-2 and the ISPS Code.

4.4 The Committee further noted that the information provided in document MSC 84/4/2 had been made available to the correspondence group on the security aspects of the operation of ships which do not fall within the scope of SOLAS chapter XI-2 and the ISPS Code for its consideration.

4.5 In this context, the Committee also noted that a demonstration project to trial, test and assess AIS class B transponders and the interaction between AIS class A and class B transponders was being conducted in the Straits of Malacca and Singapore by Indonesia, Malaysia and Singapore (the littoral States) with support from Australia, Japan and the Republic of Korea. The demonstration project was one of the six projects identified during a series of IMO-sponsored meetings convened in cooperation with the littoral States for the purposes of enhancing safety, security and environmental protection in the Straits of Malacca and Singapore. The Committee noted that the intention was to report the result of the project to the Organization in due course.

## ISO Maritime and supply chain security standards

4.6 In considering the updated information provided by ISO (MSC 84/4/5) on maritime and supply chain security standards, the Committee noted the information provided, thanked ISO for its work which complements the efforts of the Organization to enhance maritime security and invited ISO to continue to update the Committee on the activities it is undertaking in this important area.

## Port facility security audits

4.7 The Committee considered the proposals of Canada (MSC 84/4/3) on the development of guidance on port facility security audits to supplement the guidance provided in MSC.1/Circ.1194 on Effective implementation of SOLAS chapter XI-2 and the ISPS Code and MSC.1/Circ.1193 on Guidance on voluntary self-assessment by SOLAS Contracting Governments and by port facilities.

4.8 Having noted the proposal of Canada to establish a correspondence group to progress the matter intersessionally for further consideration at MSC 85, the Committee, taking into account that MSC 83 had already re-established the correspondence group on security aspects of the operation of ships which do not fall within the scope of SOLAS chapter XI-2 and the ISPS Code and had instructed it to report to MSC 85, decided to consider the development of guidance on port facility security audits further at its next session and invited SOLAS Contracting Governments and international organizations to submit, taking into account the suggestions set out in document MSC 84/4/3, proposals and comments on the issue.

# Development of model legislation on maritime security

4.9 Recalling that MSC 82 had agreed to recommend the inclusion, as a high-level action for the 2008-2009 biennium, of the development of model legislation on maritime security, the Committee considered a submission by Austria *et al* (MSC 84/4/4) outlining preliminary ideas on the issues which would need to be discussed when developing model legislation on maritime security.

4.10 The Committee agreed that such model legislation on maritime security would have to be flexible enough to take into account, for example, the diversity of legal systems and the national structures of SOLAS Contracting Governments and the legal status of the operators of port facilities (i.e., state-owned or private port facilities) and invited SOLAS Contracting Governments and international organizations to submit, taking into account the suggestions set out in document MSC 84/4/4, proposals and comments for further consideration of the issue at its next session.

## Proposed amendments to MSC/Circ.1097

4.11 The Committee recalled that MSC 77 had recognized and considered the need for additional information to assist Contracting Governments and the industry with the implementation of, and compliance with, the special measures to enhance maritime security detailed in SOLAS chapter XI-2 and the ISPS Code, and had developed MSC/Circ.1097 on Guidance relating to the implementation of SOLAS chapter XI-2 and the ISPS Code.

4.12 The Committee considered the proposals by IACS (MSC 84/4/1) to amend MSC/Circ.1097 by adding two sub-sections, the first on the handling of failures identified during ISPS Code verification; and the second on conflicts between safety and security and decided not to pursue, at this stage, the matter. Notwithstanding the aforesaid, the Committee agreed that, should the need arise, the proposals in document MSC 84/4/1 could be considered further at its next session.

# 5 GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

5.1 The Committee recalled that MSC 83, in considering the report of the GBS Working Group, had tentatively agreed to draft SOLAS amendments to make the draft International goal-based new ship construction standards for bulk carriers and oil tankers mandatory. Regarding the Standards themselves, MSC 83 had concurred with the view of the group that it would not be possible to finalize them until Tier III of the GBS (verification of compliance) had been completed. In this context, with regard to the draft Guidelines for the verification of compliance with GBS (Tier III verification guidelines), MSC 83 had agreed that a second trial application of the Guidelines (following the first trial application agreed at MSC 82), was necessary in order to finalize them and had approved a project plan for such a second trial application, using the IACS CSR for oil tankers. The final report of the Pilot Panel carrying out the project is scheduled expected for MSC 85.

5.2 The Committee also recalled that MSC 83 had agreed to the following work plan for the development of GBS, bearing in mind that both the prescriptive and the safety level approaches should move forward as integral elements of IMO GBS:

- .1 clarification of the work to be done to develop a generic GBS framework;
- .2 identification and compilation of the elements of the framework that have already been agreed to or proposed in previous MSC submissions, working group reports or other IMO instruments (e.g., FSA Guidelines, HEAP process Guidelines) and identification of existing gaps; and
- .3 development of a prioritized plan to close the gaps and provide a unified framework that ensures consistent development of GBS, i.e. both the prescriptive and safety level approaches,

and had decided that it would be more effective to focus efforts at this session on the unified GBS framework and the safety level approach (SLA) and dedicate MSC 85 to the finalization of the GBS for bulk carriers and oil tankers, including Tier III and the associated SOLAS amendments.

5.3 The Committee further recalled that, in line with the above decisions, MSC 83 had established a Correspondence Group on the Safety Level Approach under the coordination of Germany and, in line with the work plan referred to in paragraph 5.2, had instructed it to clarify the work to be done to develop a generic GBS framework; to identify and compile the elements of the framework that have already been agreed to or proposed previously and identify existing gaps; and to develop a prioritized plan to close the gaps and provide a unified framework that ensures consistent development of GBS, using both the prescriptive and safety level approaches.

## Outcome of the GBS Working Group established at MSC 83 and the Pilot Panel

5.4 The Committee noted the following documents reporting on ongoing work the outcome of which will be presented to MSC 85:

.1 MSC 84/5 (Chairman of the GBS Working Group), reporting on the discussions of the GBS Working Group at MSC 83 on the draft Guidelines for the verification of compliance with GBS and containing in the annex a list of detailed comments made during the work of the group, which have been taken into account by the

Pilot Panel in its ongoing review of the Tier III verification process (document MSC 84/5/2); and

.2 MSC 84/5/2 (Coordinator of the Pilot Panel), reporting on the progress made with the second trial application of the Tier III verification process since MSC 83, in particular that the Pilot Panel has completed an initial revision of the Tier III guidelines and has provided IACS with the revised guidelines as scheduled.

#### Possible need for amendments to other IMO instruments

5.5 The Committee considered document MSC 84/5/1 (Secretariat), presenting the view of the Secretariat on the possible need for amendments to IMO instruments, in particular the MARPOL and Load Line Conventions, following the eventual adoption of the GBS for bulk carriers and oil tankers, as requested by MSC 83, and agreed that the matter should be considered in detail at MSC 85 when the GBS for bulk carriers and oil tankers are expected to be finalized.

#### **Report of the correspondence group**

5.6 The Committee considered the report of the correspondence group (MSC 84/5/3), noting that the group had discussed in detail the work to be done to develop a generic GBS framework, the elements of the framework that have already been agreed to or proposed in previous MSC submissions and, consequently, the items to be included in a long-time work plan. Following this, the group arrived at a condensed work plan which was prioritized as set out in paragraph 54 of the report of the group.

5.7 The Committee also had for its consideration the following documents, commenting on the report:

- .1 MSC 84/5/4 (Denmark, Germany, Sweden), containing detailed proposals for the development of a generic framework for GBS, defined as a standard that "determines a goal to be achieved but without specifying the solution", whereby the structure is based on a "rules for rules" part, including the IMO mission statement, goals and functional requirements, and a "rules for the ship" part, based on the regulatory framework of today and including IMO conventions, classification rules, etc. High-level goals and corresponding clusters of functional requirements are illustrated with examples;
- .2 MSC 84/5/5 (Japan), agreeing that the generic framework should contain top-level goals, sub-goals and functional requirements that have to be fulfilled to meet the sub-goals and consequently the top-level goal. Two examples, in terms of intact stability and structural safety, are explained for further consideration of the methodology to compensate for the gaps between top-level goals and functional requirements; and
- .3 MSC 84/INF.5 (Netherlands), providing the text of the NATO Naval Ship Code and chapter VII of the annex to the Code, which is used in paragraph 5.3 of the Code as an example to illustrate how the GBS methodology was applied in the drafting of the regulations of the Code.

5.8 The Committee agreed to refer the report, together with documents MSC 84/5/4, MSC 84/5/5 and MSC 84/INF.5, to the GBS Working Group for further detailed consideration.

# Scope of the agenda item

5.9 The delegation of the Bahamas, referring to the terms of reference of the GBS Working Group, proposed that the group should be instructed to focus on new ship construction standards only. They pointed out that the original discussion at the Council on the need for the establishment of this agenda item had been on the need to give Member States oversight with regard to the rules of classification societies concerning ships' hulls. In the view of the delegation, the report of the GBS correspondence group went far beyond the remit of the agenda item which was clearly limited to new ship construction. The work done by the correspondence group on a generic GBS framework covering various ship design aspects not related to hull strength standards would need to be accommodated by a new work programme item for which a compelling need would have to be demonstrated. The delegation felt that, if the safety level approach was to be further developed under the existing agenda item, it should concentrate on hull construction standards for new ships only.

5.10 The above view was supported by a number of delegations which supported the proposal to narrow the terms of reference of the GBS Working Group to new ship hull construction standards. During the discussion, the following views were, *inter alia*, expressed:

- .1 while the Committee had agreed at MSC 83 to follow both approaches, SLA and prescriptive, in parallel, the work should, for both approaches, focus on new ship construction;
- .2 the outcome of the currently ongoing work on the GBS for bulk carriers and oil tankers should be finalized first and experience in their application should be gained, before expanding the scope of the work to the development of a generic GBS framework for IMO rule-making; and
- .3 the decision of the Council regarding the title of the agenda item, i.e. goal-based new ship construction standards, and its inclusion in the High-level Action Plan of the Organization (resolution A.990(25)) meant that the scope of the work should be kept to the development of construction standards for new ships only.

5.11 A number of other delegations did not agree with the views described above and pointed out the following:

- .1 the Committee had already agreed at previous sessions to expand the work to include the development of a generic GBS framework;
- .2 the decision of the Assembly to include the item on GBS in the High-level Action Plan of the Organization (resolution A.990(25)), which foresees the development of GBS through both approaches in parallel, meant that the expansion of the work was implicitly agreed;
- .3 the GBS concept should be applied to the rule-making process in general and not only with regard to hull strength standards for new ship construction and should be used for the development of a future overarching regulatory framework which would encompass the prescriptive and safety level approaches; and

- .4 the meaning of the term "new ship construction" was much wider than just hull strength standards for new ship construction and has been understood, from the beginning, to cover all aspects of design and construction of new ships. To reduce it to hull issues only would limit the scope of the work on GBS.
- 5.12 Other views in the matter were expressed as follows:
  - .1 the Committee should concentrate on the finalization of the GBS for bulk carriers and oil tankers at this point in time as a priority before the development of a generic GBS framework was considered, starting with putting in place the basic building blocks for the SLA, including agreement on the meaning of terminology used. In its current form, the SLA was not developed enough to be ready for the practical application; and
  - .2 since MSC 83 had already agreed to expand the scope of the work, a pragmatic solution could be to finalize the GBS for bulk carriers and oil tankers based on the prescriptive approach first and to gain experience with the application of the GBS standard, and then to develop the GBS for bulk carriers and oil tankers using the safety level approach.

5.13 The Chairman, in his summary, acknowledged that this was a difficult and complex issue. He recalled that the Committee had agreed on a work plan for the issue which included the finalization of the GBS for bulk carriers and oil tankers and the further development of the GBS concept in a parallel approach, using both the safety level and the prescriptive methodology and that the Assembly had included relevant outputs in the High-level Action Plan of the Organization, i.e. the development of goal-based ship construction standards for new bulk carriers and oil tankers and the further development of GBS based on both the prescriptive and safety level approaches as integral elements of GBS. The issue had evolved over several sessions of the Committee since MSC 78 and MSC 83 had agreed to a work plan on how to proceed in the matter. Consequently, he suggested to instruct the working group to consider the development of a generic GBS framework, at this stage focusing on hull construction of new ships, with the understanding that the work, at a later stage, would eventually be expanded to cover all aspects of design and construction of new ships.

## Establishment of the GBS Working Group

5.14 Following the discussion, the Committee established the GBS Working Group and instructed it to consider in detail the report of the correspondence group (MSC 84/5/3), taking into account documents MSC 84/5/4, MSC 84/5/5, MSC 84/INF.5 and comments, proposals and decisions made in plenary, and, in particular, to:

- .1 consider the condensed and prioritized work plan proposed by the correspondence group (MSC 84/5/3, paragraphs 52 to 54) and prepare a final work plan, including a time frame, for consideration by the Committee;
- .2 consider the development of a generic framework for IMO GBS, focusing, at this stage, on hull construction of new ships, in the understanding that, at a later stage, the work will cover every aspect of design and construction of new ships;
- .3 consider the development of general GBS guidelines; and

.4 consider whether a GBS Correspondence Group should be established and, if so, prepare terms of reference for the group.

#### **Report of the GBS Working Group**

5.15 Having received the report of the group (MSC 84/WP.4), the Committee approved it in general and took decisions as outlined in the following paragraphs.

#### Development of generic GBS guidelines, including a description of a generic GBS framework

5.16 The Committee noted that the group had an extensive discussion on the development of generic guidelines for the application of GBS to support the IMO regulatory development process and had agreed that the current effort to develop goal-based standards consists of three essential and related elements, namely the GBS for the new construction of oil tankers and bulk carriers; the safety level approach; and the development of generic GBS guidelines. Generic GBS guidelines would link the first two elements, as well as other initiatives which may be undertaken, by providing a unifying framework to ensure a similar structure and consistent approach.

5.17 The Committee agreed to the key principles contained in the generic guidelines for developing goal-based standards (the Guidelines), as set out in the annex of the report of the group, as a basis for any further work in this regard, noting that figure 1 of the Guidelines indicates the relationship between a GBS and a generic GBS framework.

#### Prioritized work plan to finalize the generic GBS guidelines

5.18 The Committee, noting that the group reviewed the condensed and prioritized work plan, as presented in paragraphs 52 and 54 of the report of the GBS Correspondence Group (MSC 84/5/3), agreed that the following steps should be taken, in priority order, to finalize the draft Guidelines, with a view towards ensuring that they were generic:

- .1 further development of the section on "Verification of compliance" to address process, method and criteria needed to verify rules/regulations for ships;
- .2 development of a process for monitoring the effectiveness of a GBS, taking into consideration the relevant items in paragraph 52.4 of the report of the GBS Correspondence Group (MSC 84/5/3);
- .3 further refinement of the generic GBS framework, taking into consideration the relevant items in paragraph 52.2 of the report of the GBS Correspondence Group (MSC 84/5/3);
- .4 development of definitions and terminology as needed for effective use of the Guidelines; and
- .5 incorporation of lessons learned from the pilot project on the trial application of the verification of compliance with GBS using IACS CSR for oil tankers (MSC 83/28, paragraph 5.66).

# Work plan for the further development of goal-based standards

5.19 The Committee noted that the group had updated the short-term plan for the further development of GBS agreed at MSC 83 to reflect the progress achieved at this session and, while reviewing the prioritized and condensed work plan prepared by the GBS Correspondence Group (MSC 84/5/3, paragraph 52), had noted that some elements of this work plan were relevant for the long-term development of GBS and had agreed that these and other issues should be documented for consideration by the Committee at a future session.

5.20 Subsequently, the Committee agreed to the following work plan for the continued development of GBS:

# .1 Intersessional period between MSC 84 and MSC 85

- .1.1 Pilot Panel completes trial application and finalizes Tier III of GBS for bulk carriers and oil tankers for consideration at MSC 85.
- .1.2 GBS Correspondence Group further develops the generic guidelines for developing goal-based standards with a view towards finalization at MSC 86.

# .2 MSC 85

Dedicated session to finalize and approve Tiers I to III of the GBS for bulk carriers and oil tankers and to finalize and approve associated draft SOLAS amendments.

# .3 Intersessional period between MSC 85 and MSC 86

Continued progress on the draft generic guidelines for developing goal-based standards by the GBS Correspondence Group.

# .4 *MSC* 86

- .4.1 Finalization of the generic guidelines for developing goal-based standards.
- .4.2 Development of a plan to validate the results from the safety level concept (e.g., either through the comparison of the GBS for bulk carriers and oil tankers using the prescriptive and safety level approaches or an alternative method).
- .4.3 Consideration of the long-term implementation of GBS.

# .5 *longer term considerations*

- .5.1 Assessment of the experience gained from the application of GBS and incorporation of lessons learned into the generic guidelines for developing goal-based standards.
- .5.2 Validation of the results of the safety level approach by comparing with the prescriptive approach.

- .5.3 Determination of the current safety level of the rules/regulations.
- .5.4 Application of GBS to other ship types on an incremental basis.
- .5.5 Expansion of GBS to cover every aspect of the design and construction of new ships.
- .5.6 Consideration of whether all new or revised IMO regulations, classification rules and other mandatory standards should be followed by a commentary in an agreed format, explicitly stating which functional requirements are addressed and providing the substantial basis for the regulation.
- .5.7 Consideration of whether any changes to the IMO process for submitting proposals for new work programme items are needed after approval/adoption of the Guidelines.

## **Re-establishment of the GBS Correspondence Group**

5.21 The Committee agreed to re-establish the GBS Correspondence Group, under the coordination of Germany<sup>\*</sup>, with the following terms of reference:

- .1 finalize the generic guidelines for developing goal-based standards, based on the prioritized work plan set out in paragraph 5.18 of document MSC 84/24; and
- .2 submit a report to MSC 86.

## 6 LRIT-RELATED MATTERS

6.1 The Committee recognized that, for the LRIT system to become operational on 30 December 2008, it must take decisions with respect to all issues having a bearing on the establishment and operation of the International LRIT Data Exchange (IDE), the LRIT Data Distribution Plan (DDP) and, indeed, the complete LRIT system.

6.2 In addition, the Committee also recognized that, since the actual establishment and integration of almost all components of the LRIT system would start after MSC 84, it would need to decide how matters relating to the technical aspects and the development and integration testing of the various components of the LRIT system would be handled during the period between MSC 84 and MSC 85.

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6.3 The Committee noted that all issues of principle would need to be tabled in plenary to enable it to instruct the Working Group on LRIT-related matters (the working group) accordingly, to be established at the end of the consideration of all LRIT-related matters.

6.4 The Committee recalled further that in view of the critical nature of the issues involved, and as had been identified by MSC 83 and recently by the *ad hoc* LRIT Group, matters in connection with the establishment of the LRIT system had fallen behind, in comparison to what was envisaged during MSC 81 and needed to be expedited on a priority basis.

- 6.5 The Committee agreed to consider the various matters in the following order:
  - .1 general comments;
  - .2 intentions of Contracting Governments/questionnaire on LRIT-related matters;
  - .3 matters pending since MSC 83;
  - .4 outcome of *ad hoc* LRIT Group;
  - .5 sustainability and viability of the LRIT system;
  - .6 performance review and audit of the LRIT system; and
  - .7 ongoing work within the European Union to develop a European Master plan for the fixed-based AIS networks.

6.6 The Committee considered documents MSC 84/6 (Secretariat), MSC 84/6/1 and Adds.1 to 4 (*ad hoc* LRIT Group), MSC 84/6/2 (Marshall Islands), MSC 84/6/3 (Bahamas, Liberia and Marshall Islands), MSC 84/6/4 (IMSO), MSC 84/6/5 (Austria *et al*), MSC 84/6/6 (Turkey), MSC 84/6/7 (United States), MSC 84/6/8 (Secretariat) and MSC 84/6/9 (United States).

#### **General comments**

6.7 The delegation of the Bahamas was of the view that the sustainability and financial viability of the LRIT system was an important issue, which needed detailed consideration at this session of the Committee.

#### Intentions of Contracting Governments/Questionnaire on LRIT-related matters

6.8 The Committee recalled that MSC 81, when adopting the 2006 SOLAS (chapter V) amendments on LRIT, had also adopted resolution MSC.211(81) on Arrangements for the timely establishment of the LRIT system which, *inter alia*:

- .1 invited Contracting Governments to advise MSC 82 of their firm intentions in relation to the establishment of National, Regional and Cooperative LRIT Data Centre(s) (operative paragraph 1); and
- .2 recommended that Contracting Governments take early appropriate actions to ensure that all necessary infrastructures are in place, timely, for the establishment of the LRIT system (operative paragraph 10).

6.9 The Committee noted that the *ad hoc* LRIT Group at its second session, recognizing that any future discussions on the financial viability of the LRIT system should be based on reliable data in relation to the expected volume of LRIT information packages which would be received by the LRIT system and the expected demand for such information, had requested the Secretariat to re-issue the Questionnaire on LRIT-related matters, set out in the annex to document MSC 83/6/14, and to consolidate the replies to be received and make them available for consideration by MSC 84.

6.10 The Committee also noted that, in order to have constructive discussions and avoid making too many assumptions, some of which might, at a later time, in retrospect prove to be erroneous, there was a need to have a clear understanding what Contracting Governments plan in relation to:

- .1 the establishment of National, Regional and Cooperative LRIT Data Centres; and
- .2 the provision to them of LRIT information and the volume of LRIT information they contemplate to request.

6.11 The Committee recalled that MSC 83 had noted, in particular, that only 24 Contracting Governments representing approximately just over 13% of the total Contracting Governments had provided replies to the questionnaire on LRIT-related matters.

6.12 The Committee recalled also that at MSC 83, noting the very limited response to the questionnaire, the Chairman had advised that, at this stage, there was no other alternative than to asking each Contracting Government attending MSC 83 to provide a clear indication on its plans and firm intentions by completing and handing in, if it had not already done so, the response to the questionnaire.

6.13 The Committee considered documents MSC 84/6/8 and MSC 84/WP.9. As requested by *ad hoc* LRIT Group (see paragraph 6.9 above), the Secretariat, with a view to ensuring in a systematic manner the submission of the information required by the Committee when deciding on a number of LRIT-related issues, issued a questionnaire which Contracting Governments were asked to complete and return to the Secretariat as soon as possible. Document MSC 84/WP.9 summarizes in a tabular matrix format the replies received.

6.14 The Committee noted that once again the response was insufficient. Only a total of 48 responses had been received: 13 Contracting Governments had updated their previous responses and 26 Contracting Governments had provided new information.

6.15 The observer from ICS voiced the industry's desire to reopen the debate on the establishment of the International LRIT Data Centre (IDC). He alluded to the fast approaching deadline of 1 January 2009 and expressed his concerns on ships not being able to transmit LRIT information, not due to their own fault, but because flag States had not yet made the necessary relevant provisions in establishing or appointing their LRIT Data Centres (DCs). He expressed the concern that, following the recent new legislation, ships calling at United States ports may become liable to criminal and civil penalties through no fault of theirs, unless the proper IDC is established. He concluded by stating that more Contracting Governments should respond to the questionnaire to enable the Committee to make informed decisions.

6.16 The delegation of the Bahamas stated that presently most of the Contracting Governments were constrained from taking relevant actions due to lack of guidance on LRIT-related matters from the Committee, since most components of the LRIT system were still under development. It was, therefore, hoped that the present session would provide the necessary guidance urgently required.

The delegation of Slovenia informed the Committee that the European Union was 6.17 working hard towards the timely establishment and operation of the European LRIT Data Centre. Many actions had already been initiated, like drafting of technical specifications and developing an European Union ship database. This was a large and complex undertaking involving the European Commission, the 27 European Union Member States as well as Iceland and Norway with a total of around 10,000 ships. Due to the complexity of the project and the involvement of 29 IMO Member States and about 10,000 ships, the European LRIT Data Centre might not be operational on time. This might also be the case for many other IMO Member States. The European Union was not proposing a postponement or amendment to the relevant SOLAS regulations nor to open a debate on this issue. However, they believed that at the next session of the Committee, the issue should be considered in more detail with a view to examining the possibility of providing for leniency on the enforcement of the control provisions of the relevant SOLAS regulations during the first year of implementation. The delegation of Slovenia reiterated their commitment to use the LRIT messages within the European Union for security, safety, environmental protection and search and rescue (SAR) purposes.

6.18 The delegation of the Islamic Republic of Iran stated that with respect to the relaxation of control procedures, it agreed with the proposal of the European Union and reminded the Committee of its intervention on the same matter at MSC 83 (MSC 83/28, paragraph 6.22 refers).

6.19 The Chairman urged delegates to provide the required information on their intentions as to the establishment of DCs during the session to enable the Committee to make informed decision in this respect.

6.20 The Committee referred documents MSC 84/6/8 and MSC 84/WP.9 to the working group for further consideration.

## Matters pending since MSC 83

6.21 The Committee considered documents MSC 84/6 (Secretariat), identifying a number of outstanding matters on which the Committee and its working group would need to continue its work. On the basis of the report of the group (MSC 83/WP.6/Rev.1) and that of the Committee (MSC 83/28, paragraphs 6.76, 6.83 to 6.85, 6.88, 6.89 and 6.91), the group would need to continue its work on issues set out in paragraphs 2.1 to 2.5 of document MSC 84/6, relating to issues, amongst others, of a sustainable and viable financial basis; performance of IMSO of functions of the LRIT Coordinator: models of various agreements needed for the LRIT system, as well as consideration of annex 4 of document MSC 83/WP.6/Rev.1, which could not be finalized at MSC 83, due to time constraints.

6.22 The observer from IMSO stated that the pending issues outlined in paragraphs 2.1 to 2.5 of document MSC 84/6 had a direct impact on the LRIT Coordinator's work and these policy issues should thoroughly be discussed in plenary.

6.23 The delegation of the Bahamas was of the opinion that paragraph 2.1 of document MSC 84/6 relating to the financial aspects of the LRIT system deserved detailed discussion and subsequent decision in plenary, as it seemed that all burden would be on the flag States since port and coastal States seemed not to share the initial costs involved by guaranteeing their requests and use of the transmitted messages.

6.24 The delegation of China stated that with respect to financial issues, the Committee had to take into account the concerns of all Contracting Governments and take appropriate decisions thereon. Secondly, there was a need for confidentiality of the LRIT information, including the establishment of an effective management system.

6.25 The Committee referred document MSC 84/6 to the working group for further consideration.

# Outcome of *ad hoc* LRIT Group

# Reports of the ad hoc LRIT Group

6.26 The Committee recalled that MSC 83 had approved the convening of an intersessional *ad hoc* LRIT Group (the group) and instructed it, in essence, to consider all issues of a technical nature which had a bearing on the timely establishment of the LRIT system.

6.27 In considering the report of the group (MSC 84/6/1 and Adds.1 to 4), the Committee approved the report in general, noted that the report had set out seventeen points on which it had been requested to take action and agreed only to address a selected number of key issues where it was necessary to have a debate in plenary before referring matters to the working group for further consideration. In particular, the Committee took action as reported in the ensuing paragraphs.

## Progress report on the establishment of the interim IDE

6.28 The Committee noted that the United States, as required by schedule for the implementation of the LRIT system (MSC 83/WP.6/Rev.1, annex 2), provided at each session a status update on development of the interim IDE system (MSC 84/6/1, paragraph 8; MSC 84/6/1/Add.1, paragraphs 6 and 7; MSC 84/6/1/Add.2, paragraph 1.6).

## Amendments to the technical specifications

6.29 The Chairman of the group provided a comprehensive summary of the discussion within, and the action taken by, the group relating to the amendments to the technical specification for the LRIT system, notably the finalization of the XML Schemes; development of amendments to the technical specifications for communications within the LRIT system and to the technical specifications for International LRIT Data Exchange and consequential to the technical specifications for International LRIT Data Centre; and development of the processing algorithm for standing orders.

6.30 The group had agreed to advise the Committee that, although it was recommending the inclusion, in the Technical specifications for the LRIT system, of the Technical specifications for the International LRIT Data Centre, the work done so far was primarily concentrated on issues relating to the IDE; communications within the LRIT system; the DDP; and DDP server. Thus, the Technical specifications for the International LRIT Data Centre had received very limited
attention and in case the Committee was to reconsider its decisions in relation to the establishment of an IDC, the related technical specification should be subject to a comprehensive revision. In addition, the group was of the view that, at this stage, the Technical specifications for the International LRIT Data Centre should be considered as providing only a limited guidance for those establishing DCs and any reference to it should be done with care and diligence.

6.31 The Committee subsequently approved the amendments to the Technical specifications for the International LRIT Data Exchange, the Technical specifications for the International LRIT Data Centre and Technical specifications for communications within the LRIT system adopted by the group and the actions taken by the group as if they had been taken by the Committee (MSC 84/6/1, paragraphs 11 to 25, 31 and 35 to 42; MSC 84/6/1/Add.1, paragraphs 11 to 35 and 51 to 53; MSC 84/6/1/Add.2, paragraphs 2.1 to 2.38; and MSC 84/6/1/Add.4, annex 2).

### Simplification of the definition of geographical areas

6.32 The Chairman of the group provided a summary of the discussion within, and the action taken by, the group relating to the definition of the geographical areas which needed to be included in the DDP in order to enable the DCs to correctly implement the provision of regulation V/19-1.8.1.

6.33 Whilst a high number of geographical coordinate points would define the various geographical areas with greater accuracy, the size of the various files containing the points was, in such cases, very large and required considerable time to be transferred from the DDP and processed, as internal inputs, by the DCs, thus slowing down the entire LRIT system. In addition, DCs, when processing geographical areas defined with high level of accuracy, would be required, in order to meet the quality of service criteria specified in the Performance standards and functional requirements for the long-range identification and tracking of ships (Performance standards), to have large computational capacities and capabilities.

6.34 The group had therefore agreed that, at this stage of the development of the LRIT system, the only practical solution was to recommend, subject to the agreement of the caveats to be posted on the DDP, the use of simplified geographical polygons and to develop guidance on the constraints to be observed when defining them. The related constraints, which had been developed after comprehensive discussions, were specified in section 7 of part I of the Technical specifications for the LRIT Data Distribution Plan which were set out in annex 3 to document MSC 84/6/1/Add.2.

6.35 The Secretariat advised that, taking into account the discussions thus far, would be providing to the working group with a draft of the caveats to be posted on the DDP for consideration and eventual advice to the Committee.

6.36 With regard to the agreement of the geographical areas to be included in the DDP and the proposed simplification of the geographical areas representing internal waters and territorial sea, the delegation of China expressed the view that the Committee would need to recognize that this was a complex and sensitive issue, which might entail issues of baseline data, States' sovereignty, and territorial waters and needed to be handled with caution.

6.37 The delegation of Turkey, supporting the views of the delegation of China, stated that these geographical areas should only represent the result of the technical and unilateral work done for the purposes of LRIT system by nations. In addition, there could be inevitable

overlapping within the geographical areas submitted to the DDP by different nations. Therefore, these geographical areas provided by nations for technical purposes of LRIT system should not be regarded as representing maritime jurisdiction areas. This should be one of the caveats that would be adopted before the end of this session.

6.38 The Secretariat clarified that, since so far no input had been received, further discussion was necessary in the working group regarding the caveats to be posted on the DDP.

6.39 The Chairman, in his summing up, confirmed that the agreement on the use of simplified geographical polygons for the DDP was conditional, subject to outcome of the discussion in the working group regarding the caveats to be posted on the DDP.

6.40 The Committee subsequently agreed, subject to the agreement of the caveats to be posted on the DDP, that the geographical areas to be included in the DDP, should be simplified geographical polygons in accordance with the guidance provided in section 7 of part I of the Technical specifications for the LRIT Data Distribution Plan (MSC 84/6/1/Add.4, annex 3).

# Technical specifications for the LRIT Data Distribution Plan

6.41 The Chairman of the group provided a summary of the discussion within, and the action taken by, the group relating to the development of technical specifications for the DDP and related XML Schemes.

6.42 The Committee subsequently approved the draft Technical specifications for the LRIT Data Distribution Plan (MSC 84/6/1/Add.4, annex 3).

# Consolidation of technical specifications for the LRIT system

6.43 The Chairman of the group provided an explanation relating to the need for the consolidation of all the amendments to the technical specifications for the LRIT system.

6.44 The group agreed that at this stage of the development of the LRIT system there was a very urgent need to consolidate all amendments to the IDE, IDC and communications specification adopted thus far and to incorporate these into a single basic document. The group was also of the view that the preparation of aforesaid technical specifications in a revised format, consolidating all amendments, would also contribute to the management of risks which might arise in the establishment of the LRIT system as a result of inadvertent use of incorrect technical documentation. The group had also agreed that the Technical specifications for the LRIT Data Distribution plan should also be included in the single basic document.

6.45 The Committee consequently authorized the consolidation of the technical specification for the LRIT system in a single document consisting of the Technical specifications for the International LRIT Data Exchange, the Technical specifications for the International LRIT Data Centre, the Technical specifications for communications within the LRIT system, and the Technical specifications for the LRIT Data Distribution Plan and incorporating all amendments (see also paragraph 6.137).

# Documentation of future amendments to the technical specifications for the LRIT system

6.46 The Chairman of the group provided an explanation relating to the method to be followed when documenting future amendments to the technical specifications for the LRIT system.

6.47 The group had recommended that, in case the Committee was to establish the arrangements which were needed between MSC 84 and MSC 85 for the timely consideration and adoption of amendments to the technical specifications for the LRIT system in the light of the results of the testing to be conducted after MSC 84, the Committee should, in lieu of following the practice of the Organization when documenting amendments, allow the incorporation of the agreed amendments in the basic document and its issue as a revised version having effect upon release.

In such cases the adopted amendments would be clearly identified in the revised version which would then replace the basic document and become the basic document. Such an approach, which was in line with industry practices, would be of great help to those involved in the establishment of the LRIT system and would facilitate the development of the documentation relating to the testing of the system.

In addition, as the related work would be once more conducted on the understanding that the Committee would consider and, unless it deemed it to be unreasonable, would approve, accept and endorse, as the case might be, the actions taken in retrospect as if they had been taken by the Committee, it would provide the necessary documentary evidence for consideration by MSC 85.

The aforesaid recommended approach should be based on the understanding that the technical specifications for the LRIT system would continue to be in the English language only until the end of MSC 85 or such later time to be decided by the Committee. Such an approach would not have any adverse effects on the development and implementation of the LRIT system and, in fact, in order to avoid waste of resources the prudent approach would be to translate the related documents in the French and Spanish languages only when the Committee would be confident that the adoption of amendments would no longer be necessary.

6.48 The Committee considered paragraphs 2.56 to 2.58 of document MSC 84/6/1/Add.2 on the proposed approach for recording and documenting any amendments to the aforesaid technical specifications which may be adopted during the period between MSC 84 and MSC 85, agreed with the proposed approach and referred the matter to the working group for further consideration and to advise the Committee accordingly.

# Guidance in relation to the definition of geographical areas for Contracting Governments which are neither States Parties to UNCLOS nor States Parties to 1958 TS and CZ

6.49 The Committee considered paragraphs 3.10 and 3.13 of document MSC  $\frac{84}{6}$  Add.2 on whether there was a need, as far as those Contracting Governments which are neither States Parties to UNCLOS<sup>1</sup> nor States Parties to 1958 TS and CZ<sup>2</sup>, to provide guidance in relation to the definition of geographical areas which should be included in the DDP.

6.50 The Chairman of the group provided a summary of the matters, noting that, whilst some of the Contracting Governments were not States Parties to any related international treaties, most of the 158 Contracting Governments were States Parties to different treaties of relevance to the issue, which might complicate the definition of the geographical areas for the purposes of the DDP.

<sup>&</sup>lt;sup>1</sup> United Nations Convention on the Law of the Sea.

<sup>&</sup>lt;sup>2</sup> Convention on the Territorial Sea and the Contiguous Zone.

6.51 The delegation of Turkey stated that it was not party to UNCLOS. However, Turkey agreed with most of its provisions that reflect international customary law. Accordingly it should be noted that Turkey's maritime jurisdiction areas, where established so far, were in line with international law. As such it was in their view not necessary to provide further guidance for the definition of geographical areas. Consequently, Turkey would provide, as appropriate, the necessary input to the DDP.

6.52 The delegation of Venezuela supported Turkey and stated that it also used customary law to define geographical areas.

6.53 The delegation of Australia stated that any guidance or caveats should be through an MSC circular rather than to be included in the DDP.

6.54 The Chairman, in his summing up, concluded that no further guidance was needed in this matter.

## Proposed draft amendments to the Performance standards

6.55 The Committee considered documents MSC 84/6/1, paragraphs 26 to 30 and 32 to 34; MSC 84/6/1/Add.1, paragraphs 42 to 50; MSC 84/6/1/Add.2, paragraphs 2.39 to 2.49, 3.14, 3.38 to 3.42 and 3.81 to 3.83; and MSC 84/6/1/Add.4, annex 4, on proposed draft amendments to the Performance standards including the adoption of Revised Performance standards consolidating all amendments.

6.56 The Chairman of the group provided a summary of the discussion within the group in relation to, and justification for, the development of draft amendments to the Performance standards. The major part of the proposed amendments addressed matters relating to the DDP and the DDP server. In essence, the existing section 11.2, which specified the data to be included in the DDP had been recast so as to reflect the actual needs of the system. In addition, whilst the Performance standards specified requirements in relation to communication between the DCs and the IDE, they did not include provisions in relation to communications between the DCs and the DDP and between the IDE. Thus, a new section 11.3 was proposed which addressed the salient issues and which mirrored the corresponding provisions of section 7.1 for the DCs and section 10.3 for the IDE. Consequential amendments to sections 7.1 and 10.3 were also proposed so as to include the related references to the DDP server.

6.57 One of the pending matters since MSC 83 had been as to how and when the technical specifications should be integrated in the Performance standards. Through the proposed draft amendments, the inclusion of related references to the technical specifications in sections 7, 9, 10 and 11 of the Performance standards would provide the required links.

6.58 The group, recalling that the Committee had already adopted one set of amendments to the Performance standards and bearing in mind the length of the proposed draft amendments, as well as those proposed by IMSO as the LRIT Coordinator, recommended, instead of adopting another set of amendments to the Performance standards, to consider adopting Revised performance standards.

6.59 The Committee referred the matter to the working group for further consideration and to advise the Committee accordingly.

## **Developmental and integration testing**

6.60 The Committee considered documents MSC 84/6/1, paragraph 54.1; MSC 84/6/1/Add.1, paragraphs 76 to 94 and 102.1; and MSC 84/6/1/Add.2, paragraphs 3.15 to 3.32, on issues relating to the developmental and integration testing of the components of the LRIT system and the organization and coordination of the testing programme of the prototype and production LRIT system.

6.61 The Chairman of the group provided a summary of the discussion within, and the action taken by, the group relating to the developmental and integration testing, concluding that the Protocols for the developmental testing of the LRIT system and for testing the integration into the system of new LRIT Data Centres (MSC 83/6/1, annex 5) had been developed assuming certain scenarios which, as matters now stood, were unrealistic. In addition, certain aspects of the tests envisioned for the LRIT system, such as software module tests, factory acceptance tests and in-service verification tests, required distinct and unique testing procedures tailored to the specific software and hardware configurations to be developed by a likely vendor and which are different from those currently being deployed by those establishing DCs, the interim IDE and the DDP. Thus, the group had agreed that, whilst the aforesaid protocols provided a valid template and included some sound provisions which were still relevant to the current realities, they needed comprehensive revision before being considered as providing the high level documentation for the testing of the LRIT system. The group, therefore, on the basis of the dates stipulated in resolution MSC.211(81) developed a preliminary plan in relation to the testing and integration of the LRIT system which needed to be further refined at the current session and invited the Committee to:

- .1 establish the arrangements which are needed between MSC 84 and MSC 85 for the timely development and adoption of testing documentation and for the consideration and adoption of any required amendments to either the technical specifications or the testing documentation; and
- .2 consider all issues relating to the management of the test programme of the LRIT system (other than those relating to the development of the testing documentation).

6.62 In this context, the Committee also considered the proposal by the United States (MSC 84/6/9) inviting the Committee to consider, taking into account any related recommendations of the *ad hoc* LRIT Group, the testing of the various components of the LRIT system and decide, in particular, on the process to be followed during the period between MSC 84 and MSC 85.

6.63 The observer from IMSO stated that they fully supported and endorsed the views of the United States that, with respect to the testing and integration of the various components of the LRIT system there would be a need to quickly turn around test plans and test results and minimize the time taken to approve test plans and test results, so as to avoid any delays which might affect the establishment of the LRIT system by 30 December 2008. Secondly, it was imperative that the Committee established a streamlined approval process to quickly and effectively approve the above-mentioned plans and results.

6.64 The Committee, agreeing with the proposals in principle, referred the matter to the working group for further consideration and to advise the Committee accordingly.

# Continuity of service of the LRIT system

6.65 The Committee considered documents MSC 84/6/1, paragraphs 16 and 54.2; MSC 84/6/1/Add.1, paragraph 102.2; and MSC 84/6/1/Add.2, paragraphs 3.33 to 3.37) on development of a plan for the continuity of service of the LRIT system.

6.66 The Chairman of the group provided a summary of the discussion within, and the action taken by, the group relating to the issue of continuity of service of the LRIT system. Recognizing that there might be circumstances which might require the temporary shutting down of the IDE or the DDP server, for example, due to denial of service or a malicious attack and the likelihood that a DC might be forced to be temporarily shut down could not be excluded, the group agreed to recommend that a plan for the continuity of service of the LRIT system would need to be developed between MSC 84 and MSC 85 and agreed by MSC 85 so as to avoid any undesired circumstances once the LRIT system entered operation on 31 December 2008. The group agreed to invite the Committee to determine how such a plan should be developed and discussed during the intersessional period.

6.67 The Committee referred the matter to the working group for further consideration and to advise the Committee accordingly.

## Public Key Infrastructure (PKI) certificates

6.68 The Committee considered documents MSC 84/6/1, paragraph 61; MSC 84/6/1/Add.1, paragraphs 36 to 40; and MSC 84/6/1/Add.2, paragraphs 3.76 and 3.77, on the issue of Public Key Infrastructure (PKI) certificates.

6.69 The Chairman of the group provided a summary of the discussion within, and the action taken by, the group relating to the issue, renewal and revocation of PKI certificates, and noted that the Secretariat, taking into account the discussions thus far, would be providing to the working group related information for its consideration and eventual advice to the Committee.

6.70 The Committee referred the matter to the working group for further consideration and to advise the Committee accordingly.

## Shipborne equipment

6.71 The Committee considered documents MSC 84/6/1, paragraphs 44 to 53; MSC 84/6/1/Add.1, paragraphs 68 to 75; MSC 84/6/1/Add.2, paragraphs 3.78 and 3.79; and MSC 84/6/1/Add.4, annex 5, on the issues which had arisen as a result of the provisions of regulation V/19-1.6 which specified that the shipborne equipment used to transmit LRIT information shall be of a type approved by the Administration.

6.72 The Chairman of the group provided a summary of the debate in, and the action taken by, the group relating to the issue of shipborne equipment. The group, recalling that SOLAS regulation V/19-1.6 specified that any shipborne equipment to be used for transmitting LRIT information "shall be of a type approved by the Administration", had considered the need for verification and certification of compliance of the ships which were requirements of regulation V/19-1. The group had agreed that, as regulation V/19-1 was part of chapter V, the type approval of any shipborne equipment should be in accordance with the practice of type approval of other shipborne equipment the carriage of which was required by other provisions of chapter V. The group had also recalled that, since the start of the discussions on LRIT of ships,

in February 2002, the development of LRIT had been based on the premise that ships were expected to comply with the related requirements, using existing shipborne equipment. In fact, the 2002 SOLAS Conference in Conference resolution 10 on Early implementation of long-range ship's identification and tracking stated that "equipment installed on board and ashore is available for immediate use and would allow the early implementation of LRIT" and, on that basis, urged "Contracting Governments to take, as a high-priority, any action needed, at the national level, to" implement and begin LRIT of ships.

6.73 The Chairman of the group advised that the group had noted that the requirement for the shipborne equipment to be of a type approved by the Administration meant that any new equipment, which ships might need to install on board for whatever reason in order to comply with the obligation to transmit LRIT information, should be of a type approved by the Administration; and any existing shipborne equipment, already installed on board, which might be used for the same purpose should also be of a type approved by the Administration. From the discussions within the group it had transpired that none of the Administrations had type approved any new or existing shipborne equipment for such a purpose and none of the manufacturers had developed any products which were type approved. In addition, the requirement to have existing equipment already installed on board to undergo a type approval process, was not something which was logical nor a manageable, practicable or reasonable requirement, considering the number of ships which were required to comply. In simple practical terms, the requirement for a shipborne equipment to be of a type approved by the Administration meant that a prototype of the equipment had to be physically examined and tested so as to demonstrate that it met the requirements of the performance standards established by the Organization and any specific national requirements of the Administration concerned. Although equipment might be of a type approved by the Administration, when it was installed on board it still needed to undergo a variety of tests in order to verify that it functioned and performed as intended before the compliance of the ship with the related requirement could be certified.

The Chairman of the group also advised that the group had noted that, in order to solve 6.74 the problem, the Committee would need to adopt amendments to regulation V/19-1 so as not to require existing ships to use type approved equipment when transmitting LRIT information. However, whilst such a course of action might solve the problem as from the entry into force point of view of such amendments, at this stage, the earliest possible date when such amendments might enter into force was 1 July 2010. Thus, the Committee would also need to unanimously adopt an interim scheme stipulating the arrangements to be applied during the period between 31 December 2008 and 30 June 2010 in lieu of the requirements for the shipborne equipment to be of a type approved by the Administration. The group had further noted that such an interim scheme should be based on a series of examinations and tests, as determined by the Committee, which demonstrated and verified compliance of the shipborne equipment with the requirements of regulations V/19-1.4 and V/19-1.7 and of section 4 of the Performance standards. In this respect and, in view of earlier discussions within the Committee and during the last session of MSC/ISWG/LRIT 2 of difficulties which might arise when a ship changed flag or due to legacy equipment (MSC 83/6/2, paragraphs 95 to 107), the Committee would also need to establish the criteria or the range within which the functional performance of existing equipment should be considered as being acceptable. The implementation of such an interim scheme would require the active involvement and participation of application service providers (ASPs), since it would be the ASPs who would undertake the various tests; transmit to the ship being tested the various control commands; receive the LRIT information being transmitted; monitor the performance of the shipborne equipment over a period of time; and provide related objective evidence.

6.75 The Chairman of the group further advised that the group had concluded that this issue should be brought to the attention of the Committee as soon as possible with a view to enabling the Committee to take a decision as to how the issue should be handled in a practicable, uniform and consistent manner, bearing in mind that demanding compliance with the requirement for the equipment to be of a type approved could not be considered as being conducive to, or in line with, the concentrated efforts of the Committee to set up the LRIT system. The group had also proposed the adoption of an interim scheme to address the matter which should be promulgated, through an MSC circular, which should have two parts. The first part should address the administrative and procedural issues and the second part the technical matters.

6.76 Accordingly, the group had invited the Committee to consider:

- .1 whether regulation V/19-1.6 should be amended so as to delete the requirement for the shipborne equipment to be of type approved by the Administration and, if so, when such amendments should adopted and enter into force; and
- .2 in case the requirement for the shipborne equipment to be of a type approved by the Administration is to be deleted, to determine the interim scheme to be followed until the related amendment enter into force.

6.77 The observer from IACS informed the Committee that it did not see the need or added valued for LRIT compliance being brought within the existing survey and certification regimes relating to equipment type approval. LRIT was not a carriage requirement; the transmission of LRIT data was a functional requirement. There was a need for compliance testing by the application service provider. IACS, therefore, questioned if recognized organizations should get involved in the LRIT verification process.

6.78 A number of delegations supported IACS's views and were not in favour of the type approval process. It was, however, recognized by a majority of the delegations that an interim scheme was necessary, until such time when the necessary amendments to SOLAS regulation V/19-1 had entered into force or a permanent approval process was in place, and that the task to prepare such a scheme should be given to the working group.

6.79 The Committee referred the matter to the working group for further consideration and to advise the Committee accordingly.

# Matters affecting implementation of the LRIT system

6.80 The Committee considered documents MSC/*ad hoc* LRIT 3/3/1 (Bahamas) and MSC 84/6/1/Add.2, paragraphs 3.43 to 3.69 on matters affecting implementation of the LRIT system identified by the Bahamas.

6.81 The Chairman of the group provided a summary of the discussion within, and the action taken by, the group on matters affecting implementation of the LRIT system, as identified by the Bahamas, relating to the issues of exemptions; switching off of shipborne equipment and ceasing the distribution of LRIT information; and the compliance of floating production, storage and offloading units; floating storage units; and special purposes ships.

6.82 The Committee referred the matter to the working group for further consideration and to advise the Committee accordingly.

## Guidelines in relation to the provisions of LRIT information to Search and rescue services

6.83 The Committee considered documents MSC/*ad hoc* LRIT 3/3/6 (Secretariat) and MSC 84/6/1/Add.2, paragraphs 3.70 to 3.75, on the development of guidelines in relation to the provisions of LRIT information to SAR services.

6.84 The Chairman of the group provided a summary of the discussion within, and the action taken by, the group in relation to the development of appropriate guidance to SAR services in relation to the request of LRIT information which had been under discussion since COMSAR 11. The group had considered a summary of the discussions thus far; and a list of questions and general principles developed by COMSAR 12, together with a request for the preparation of an appropriate MSC circular providing related guidance to SAR services in relation to what LRIT information they were entitled to; how they should formulate such requests; through whom they should lodge them; and what documentation they needed to keep in order to document their usage and facilitate the performance review and audit of the LRIT system. The group had also agreed that the development of the requested guidance was warranted, as the SAR services would be as from 31 December 2008 amongst the first users of LRIT information. In addition such guidance would also be of use and avoid the need to produce similar guidance for the benefit of those operating DCs and the IDE. Furthermore, the approval by the Committee of the related guidance would also ensure a harmonized and consistent approach when providing LRIT information to SAR services. The group, due to time constraints, had been unable to prepare the draft of the requested MSC circular and had invited the Committee to consider referring the matter to the working group for the necessary actions.

6.85 The Committee referred the matter to the working group for further consideration and to advise the Committee accordingly.

## Guidance on the implementation of the LRIT system

6.86 The Committee considered document MSC 84/6/1/Add.2, paragraph 3.80 and annex 6, on the development of guidance on the implementation of the LRIT system.

6.87 The Chairman advised the Committee that the group had prepared, for the benefit of Contracting Governments and Administrations, a first working version of a draft MSC circular on Guidance on the implementation of the LRIT system, as set out in annex 6 to document MSC 84/6/1/Add.4. The draft identified some of the primary duties and obligations of Contracting Governments and Administrations at the initial establishment of the LRIT system and had been designed to assist the Contracting Governments which do not attend IMO meetings on regular basis. The group had invited the Committee to consider the issue further with a view of approving such an MSC circular.

6.88 The Committee referred the matter to the working group for further consideration and to advise the Committee accordingly.

## **ASPs-related matters**

6.89 The Committee considered documents MSC 84/6/1/Add.1, paragraphs 96 and 102.4 and MSC 84/6/1/Add.2, paragraphs 3.84 and 3.85, on the need for the development of guidelines to aid Contracting Governments when considering and screening applications for recognition as ASPs.

6.90 The Chairman of the group provided a summary of the discussion within, and the action taken by, the group on ASPs-related matters. Paragraph 5.5 of the Performance standards provided that in "addition to the provisions of paragraph 5.3, Administrations, Contracting Governments and the Committee may establish, in relation to the ASPs seeking their recognition, specific requirements as a condition of recognizing a particular ASP". The group, in the absence of proposals, had been unable to discuss the matter and had invited the Committee to consider the issue, bearing in mind that number of delegations had indicated that in case such guidance was to be developed the process should not distract the timely establishment of the LRIT system.

6.91 The Committee referred the matter to the working group for further consideration and to advise the Committee accordingly.

### SUSTAINABILITY AND VIABILITY OF THE LRIT SYSTEM

6.92 The Committee considered the proposal by the Bahamas, Liberia and the Marshall Islands (MSC 84/6/3), proposing revision of the interval at which the shipborne equipment should be set, to automatically transmit the ship's LRIT information to the LRIT Data Centre identified by the Administration. The co-sponsors proposed that the current standard of 6-hour intervals be revised to 12-hour intervals. The co-sponsors also proposed that during the period of trial tests of the LRIT system, beginning 1 July 2008 and until the system becomes operational, that the shipborne equipment should be set to automatically transmit at 24-hour intervals. This transmission interval should be sufficient to conduct the necessary tests to ensure the LRIT system is functioning properly, while not over burdening the system during the trial period.

6.93 There was an extensive debate on the proposals by the Bahamas, Liberia and the Marshall Islands and a large number of delegations spoke on the issue. Some delegations supported the proposal and were of the opinion that this was a good idea, as it would have a positive effect on controlling costs, since the costs associated with sustaining a viable LRIT system were primarily linked to the supply of LRIT information from ships and the demand for use of such information.

6.94 A number of other delegations were of the view that they could not support the proposals and were of the opinion that the Committee should not revise the reporting interval, since this had been a fundamental element in the establishment of the LRIT system, which originated from the maritime security regime, and could have a detrimental effect on security, as well as safety and environmental protection. Simply cutting the number of messages by half would not have the desired effect on the costs, since these were largely fixed and only to some extent dependent on the transmission costs. These delegations also requested the Committee to encourage Contracting Governments to complete the Questionnaire on LRIT-related matters so that more reliable information was available to the Committee for taking relevant decisions.

6.95 The Chairman, in summing up the debate, stated that there had been a substantive intensive discussion. There had been a lot of arguments, both in favour of and against the proposals for the current standard of reporting at 6-hour intervals be revised to 12-hour intervals and also that during the period of trial tests of the LRIT system, beginning 1 July 2008 and until the system became operational, the shipborne equipment should be set to automatically transmit at 24-hour intervals. It would be easy for him to go by the numbers and opt for maintaining the 6-hour interval which was supported by the majority; however, this was not merely a numbers game but more a question of principle, since on the other hand, concerns and questions had been raised on the necessity and need for controlling the costs including the needs and

concerns of small island developing States and least developed countries. The positive aspect of this discussion was that it had provided the Committee with a clearer picture of the pros and cons of the proposals of the Bahamas which should help the working group to consider the issue thoroughly. Accordingly, the Chairman decided to refer the matter for consideration by the working group and report to the Committee. In case, the working group was unable to come up with a viable solution, he would respect the views of the majority.

## Mini IDC

6.96 The Committee considered the proposal by the Marshall Islands (MSC 84/6/2), notifying the Committee of the availability of existing LRIT Data Centre infrastructure and resources available to those Contracting Governments not yet having established an LRIT Data Centre. The Marshall Islands re-emphasized that this submission had been made without obligation or intent to be involved in any way in the establishment or operation of the mini-IDC. They were merely attempting to assure that all such affected Contracting Governments would have available to them the means by which to participate in a compliant manner by the 31 December 2008 deadline. They invited the Committee to note that Contracting Governments interested in considering this offer in further detail should contact Pole Star Space Applications Limited directly (http://lrit.com) as soon as possible.

6.97 The observer from IMSO informed the Committee that, with respect to paragraph 8 of document MSC 84/6/2, the issue of the evaluation of the Consortium proposal by IMSO during MSC 83 was not of any relevance. The Committee would have the final say on the appointment the mini-IDC, if it was considered appropriate.

## Financial viability of the LRIT system

6.98 The Committee, at the request of the delegation of the Bahamas also considered in detail the issue of financial viability of the LRIT system. The delegation of the Bahamas stated that it needed to clarify two specific issues namely, the sharing of LRIT information within and between DCs; and the cost recovery aspect. In their view, it seemed now that there was an unfair burden on flag States in establishing the LRIT system components.

6.99 The delegation of China stated that it had the same concerns as the Bahamas. China was aware that MSC 83 had discussed the issue but the Committee had made no decisions affecting SOLAS regulation V/19-1.11.1, whereby Contracting Governments were required to "bear the costs associated with any long-range identification and tracking information they request to receive", however, the flag States were now required to bear the cost for the establishment of DCs and related costs. Hence, there was uncertainty about billing costs and charges. It was important that the Committee made clear decisions on the financial model and the concept about cost sharing.

6.100 Some other delegations were of the view that the issue had been debated extensively at previous, and earlier at this session and that they had reservations about discussion of this issue in the working group. This was a policy issue, which needed to be decided in plenary.

6.101 The Chairman, in summing up the debate, recalled the earlier discussion on the related matter of the reduction of the numbers of LRIT data transmissions and the sustainability and viability of the system debate that followed. He, therefore, was of the opinion, that the Committee had sufficiently considered the matter as far as it could at this stage and that it would

be best to instruct the working group to develop various options of financial models for consideration and decision by the Committee later at this session.

6.102 The Committee, subsequently, referred documents MSC 84/6/3 and MSC 84/6/2 to the working group for further consideration and development of relevant financial models and to advise the Committee accordingly.

### PERFORMANCE REVIEW AND AUDIT OF THE LRIT SYSTEM

6.103 The Committee considered the proposal by IMSO (MSC 84/6/4) as the LRIT Coordinator providing information and comments, concerning the implementation of the LRIT system. In addition, it has proposed a number of amendments to the Performance standards and functional requirements for the long-range identification and tracking of ships designed to reflect the needs that have become apparent in the period since they were adopted by the Committee. IMSO requested the Committee to note:

- .1 in relation to the decision of MSC 83 not to establish an IDC at this time, the concern of IMSO to ensure that the LRIT system should be open to cost-effective and operationally efficient participation by all Contracting Governments;
- .2 the information provided in relation to the IMSO LRIT Business Plan; and
- .3 consider the proposed draft amendments to the Performance standards, set out in the annex to document MSC 84/6/4, and decide accordingly.

6.104 In this context, the Committee also considered the comments by the United States (MSC 84/6/7) on document MSC 84/6/4 submitted by IMSO as the LRIT Coordinator, concerning the implementation of the LRIT system and specifically, on the proposed amendments to the Performance standards and functional requirements relating to IMSO's role as the LRIT Coordinator; advance payment for IMSO's services; and the issue of Barring of Contracting Governments from receiving LRIT information in case on non or late payment.

6.105 There was a fairly long debate on the proposal by IMSO (MSC 84/6/4) as the LRIT Coordinator, and a large number of delegations spoke on the issue. The majority of delegations were of the opinion that there could be no advance payment for IMSO's services for carrying out audits, mainly for reasons of national legislation, although other options could be considered; and IMSO should not be permitted to bar Contracting Governments from receiving LRIT information in case of non or late payment. This should be the Committee's prerogative. Some delegations were of the opinion that there was no need for on-site audits including the need for annual audits, since this could be done remotely by electronic means. Concern was also raised as to the high level of charges proposed by IMSO for services rendered to Contracting Governments during the establishment of the LRIT system.

6.106 The Chairman, in summing up the debate, stated that there had been a substantive discussion and it was evident that there had been no support for advance payment for IMSO's services (other options could be considered), a majority of the delegations did not support the need for an annual audit including the need for on-site presence. Although Barring had been accepted by MSC 83, the majority did not support barring by IMSO; this should be done by the Committee, as appropriate. Lastly, some of the proposed amendments to the Performance standards could be accepted.

6.107 The Committee referred documents MSC 84/6/4 and MSC 84/6/7 to the working group for further consideration.

# ONGOING WORK WITHIN THE EUROPEAN UNION TO DEVELOP A EUROPEAN MASTER PLAN FOR THE FIXED-BASED AIS NETWORKS

6.108 The Committee considered the document by Austria *et al* (MSC 84/6/5), providing information on the ongoing work within the European Union to develop a European master plan for the fixed-based AIS networks. The European Union also expressed its concerns as regards further work needed by IMO to agree procedures to define the coverage of fixed-based AIS networks on the basis of the real coverage and not related to the definition of sea area A1. The extended areas could and possibly should then be used for granting exemptions from the carriage requirement for LRIT equipment on ships or the transmission of LRIT information from ships trading in these areas.

6.109 In this context, the Committee also considered the document by Turkey (MSC 84/6/6), commenting on the information provided by Austria *et al* in document MSC 84/6/5 on the ongoing work within the European Union to develop a European master plan for the fixed-based AIS networks. Turkey supported the consideration of Austria *et al* that, in order to avoid costly installations on ships as well as unnecessary costs to States to buy LRIT information from communication service providers, the AIS system should be used as much as possible to provide LRIT information. Turkey believed that further work in IMO should be carried out and, if necessary, practical procedures or guidelines should be developed in order to utilize AIS coverage by Contracting Governments within the LRIT framework. The Committee noted the information provided by Turkey.

6.110 There was an extensive discussion on the proposal by Austria *et al* (MSC 84/6/5) regarding the ongoing work within the European Union in this respect. A number of delegations spoke on the issue and a majority of them supported the concept of extended AIS coverage for granting exemptions from the carriage requirement for LRIT equipment on ships or the transmission of LRIT information from ships trading in these areas. However, the view was also expressed that, as a matter of principle, consideration should be given to extending the concept on a global basis rather than one particular region.

6.111 The Committee agreed that more information was needed on this issue and caution should be exercised in addressing this subject, since there were a number of subjects to be taken into account when considering this further. Matters of principle like the foundation on which the LRIT system had been built; the need for shore-based station infrastructure; data contents of the messages; and other core components lay at the heart of the subject under consideration.

6.112 The Committee decided to refer document MSC 84/6/5 (Austria *et al*) to the working group and instructed it, time permitting, to discuss the matters raised in document MSC 84/6/5 and prepare a list of issues on which further information should be provided, for consideration by the Committee.

## Establishment of the Working Group on LRIT-related matters

6.113 Having considered the various issues relating to LRIT-related matters, the Committee established the Working Group on LRIT-related Matters and instructed it as follows:

The working group, taking into account decisions taken and proposals and comments made in plenary, should:

- .1 noting that MSC 83 has accepted, in principle, the recommendations of MSC/ISWG/LRIT 2 set out in paragraphs 142.2 to 142.14, 142.16 to 142.24 and 142.26 to 142.29 of document MSC 83/6/2, on the basis of the work done during MSC 83 as set out in annex 4 to MSC 83/WP.6/Rev.1 and taking into account the issues relating to barring set out in paragraphs 7 to 11 of document MSC 84/6/7 (United States), finalize the codification and consolidation of the issues involved in an appropriate format (which may be MSC resolution(s) and/or MSC circular(s) depending on the nature of the issues involved) so as to enable easy identification and reference and prepare and submit for consideration with a view to adoption or approval the relevant document;
- .2 consider all issues relating to the models of the various agreements needed for the establishment of the LRIT system and recommend the approach to be taken;
- .3 consider and recommend the approach to be taken for adopting, recording and documenting any amendments to technical specifications which may need to be adopted during the period between MSC 84 and MSC 85 (MSC 84/6/1/Add.2, paragraphs 2.56 to 2.58);
- .4 prepare a draft of the caveats to be posted on the DDP in relation to the definition of geographical areas which should be included in the DDP (MSC 84/6/1/Add.1, paragraphs 61 to 67 and MSC 84/6/1/Add.2, paragraphs 3.2 and 3.13);
- .5 prepare the proposed draft amendments to the Performance standards for adoption by the Committee and recommend whether, in lieu of adopting separate amendments, the Committee should adopt Revised Performance standards consolidating all amendments (MSC 84/6/1, paragraphs 26 to 30 and 32 to 34; MSC 84/6/1/Add.1, paragraphs 42 to 50; MSC 84/6/1/Add.2, paragraphs 2.39 to 2.49, 3.14, 3.38 to 3.42 and 3.81 to 3.83; and MSC 84/6/1/Add.4, annex 4);
- .6 consider the issues relating to the developmental and integration testing of the components of the LRIT system and the organization, coordination and management of the testing programme of the prototype and production LRIT system and recommend the approach to be taken (MSC 84/6/1, paragraph 54.1; MSC 84/6/1/Add.1, paragraphs 76 to 94 and 102.1; and MSC 84/6/1/Add.2, paragraphs 3.15 to 3.32);
- .7 consider the development of a plan for the continuity of service of the LRIT system and recommend the approach to be taken (MSC 84/6/1, paragraphs 16 and 54.2; MSC 84/6/1/Add.1, paragraph 102.2; and MSC 84/6/1/Add.2, paragraphs 3.33 to 3.37);
- .8 consider the issue of Public Key Infrastructure (PKI) certificates and recommend the approach to be taken (MSC 84/6/1, paragraph 61; MSC 84/6/1/Add.1, paragraphs 36 to 40; and MSC 84/6/1/Add.2, paragraphs 3.76 and 3.77);

- .9 consider the issues which have arisen as a result of the provisions of regulation V/19-1.6 which specifies that the shipborne equipment used to transmit LRIT information shall be of a type approved by the Administration and recommend the approach to be taken (MSC 84/6/1, paragraphs 44 to 53; MSC 84/6/1/Add.1, paragraphs 68 to 75; MSC 84/6/1/Add.2, paragraphs 3.78 and 3.79; and MSC 84/6/1/Add.4, annex 5);
- .10 consider the matters affecting implementation of the LRIT system identified by the Bahamas (MSC/*ad hoc* LRIT 3/3/1) and recommend the approach to be taken (MSC 84/6/1/Add.2, paragraphs 3.43 to 3.69);
- .11 consider the development of guidelines in relation to the provisions of LRIT information to SAR services and recommend the approach to be taken (MSC/*ad hoc* LRIT 3/3/6 (Secretariat) and MSC 84/6/1/Add.2, paragraphs 3.70 to 3.75);
- .12 consider the development of guidance on the implementation of the LRIT system and recommend the approach to be taken (MSC 84/6/1/Add.2, paragraph 3.80 and MSC 84/6/1/Add.4, annex 6);
- .13 consider the need for the development of guidelines to aid Contracting Governments when considering and screening applications for recognition as Application Service Provider (ASP) and recommend the approach to be taken (MSC 84/6/1/Add.1, paragraphs 96 and 102.4 and MSC 84/6/1/Add.2, paragraphs 3.84 and 3.85);
- .14 consider and recommend the approach to be taken for ensuring the timely establishment of the LRIT system on a sustained and viable financial basis, taking into account documents MSC 84/6/2 (Marshall Islands), MSC 84/6/3 (Bahamas, Liberia and Marshall Islands), MSC 84/6/8 (Secretariat) and MSC 84/WP.9 (Secretariat) and prepare and submit for consideration with a view to adoption any needed consequential amendments to the Performance standards;
- .15 consider all issues relating to the performance by IMSO of the functions of the LRIT Coordinator and, taking into account documents MSC 84/6/4 (IMSO) and MSC 84/6/7 (United States), prepare and submit for consideration with a view to adoption any needed consequential amendments to the Performance standards and advise the Committee on any issues which the Organization should bring to the attention of IMSO as matters on which Contracting Government have concerns; and
- .16 after finalizing the work on items .1 to .15 and the report to the Committee to discuss the matters raised in document MSC 84/6/5 (Austria *et al*) and prepare a list of issues on which further information should be provided.

## **Report of the Working Group**

6.114 Upon receipt of the report of the working group (MSC 84/WP.5 and Add.1 and Add.2), the Committee approved it in general and took action as outlined in the following paragraphs.

# Financial viability of the LRIT system

6.115 The Committee noted the discussions of the working group relating to the financial viability of the LRIT system and endorsed the financial model proposed.

## Models of the various agreements needed for the establishment of the LRIT system

6.116 The Committee agreed that development of models of the various agreements which might be required for the establishment of the LRIT system should no longer be pursued and, in lieu, as an interim arrangement, determined that all DCs which were seeking integration into, and after becoming part of, the LRIT system:

- .1 were obliged to implement and comply with the provisions of SOLAS regulation V/19-1;
- .2 were obliged to comply with the relevant provisions of the Revised performance standards and of the associated Technical specifications for the LRIT system;
- .3 should satisfactorily complete developmental and integration testing before they were allowed to form part of the LRIT system, and modification testing thereafter as and when the need arises, on the basis of the arrangements, procedures and testing schedules to be developed by the Organization; and
- .4 should implement and comply with any guidance in relation to financial and operational matters adopted by the Committee.

# Adoption, recording and documenting amendments to technical specifications for the LRIT system during the period between MSC 84 and MSC 85

6.117 The Committee approved the terms of reference for the *ad hoc* LRIT Group, set out in annex 1 to document MSC 84/WP.5/Add.1 and authorized the *ad hoc* LRIT Group to consider and adopt amendments to technical specifications for the LRIT system on behalf of the Committee during the period between MSC 84 and MSC 85.

## Simplification of definition of the geographical areas - Caveats to be posted on the DDP

6.118 The Committee authorized, on a provisional basis, posting of the caveats, set out in the appendix to the guidance on the implementation of the LRIT system (see paragraph 6.129), and invited Contracting Governments to submit comments and proposals, if they deem appropriate thereto for consideration and final decisions on the issue during MSC 85.

## **Revised performance standards**

6.119 The Committee adopted resolution MSC.263(84) on Revised performance standards and functional requirements for the long-range identification and tracking of ships, set out in annex 9.

## Developmental and integration testing of the components of the LRIT system

6.120 The Committee authorized the *ad hoc* LRIT Group to develop, agree and adopt, on behalf of the Committee, the documentation for the testing and integration of the LRIT system during the period between MSC 84 and MSC 85.

6.121 The Committee concurred with and endorsed the staged approach in the developmental and integration testing of the various components of the LRIT system on the understanding that the *ad hoc* LRIT Group would have the required latitude to refine the approach as the circumstances warrant.

6.122 The Committee authorized, pursuant to the provisions of paragraph 14.3.2 of the Revised performance standards, IMSO acting as LRIT Coordinator to authorize, on behalf of and subject to consideration and approval, acceptance or endorsement of the action by the Committee, the integration, on an interim basis, of the DCs which have undergone and satisfactorily completed developmental testing into the production LRIT system.

6.123 The Committee noted that the arrangements relating to the testing of the LRIT system only cover the intersessional period between MSC 84 and MSC 85 and thus the developmental and integration testing of the components of the LRIT system for the period after MSC 85 would need to be discussed and agreed at the next session.

### Plan for the continuity of service of the LRIT system

6.124 The Committee instructed the *ad hoc* LRIT Group to consider and report to MSC 85 on all matters relating to the development of a plan for the continuity of service of the LRIT system and, if possible, to develop such a plan.

### Public key infrastructure (PKI) certificates

6.125 The Committee noted that the Secretariat was investigating, pursuant to the request of the *ad hoc* LRIT Group, the issuing by the Organization of the Public key infrastructure (PKI) certificates to the components of the LRIT system.

# Shipborne equipment – Guidance on the survey and certification of compliance of ships with the requirement to transmit LRIT information

6.126 The Committee approved MSC.1/Circ.1257 on Guidance on the survey and certification of compliance of ships with the requirement to transmit LRIT information.

### Matters affecting implementation of the LRIT system

6.127 The Committee instructed the *ad hoc* LRIT Group to consider matters affecting implementation of the LRIT system and recommend to MSC 85 the approach to be taken.

### Guidelines in relation to the provisions of LRIT information to SAR services

6.128 The Committee approved MSC.1/Circ.1258 on Guidance to search and rescue services in relation to requesting and receiving LRIT information.

### Guidance on the implementation of the LRIT system

6.129 The Committee approved MSC.1/Circ.1256 on Guidance on the implementation of the LRIT system.

## ASPs-related matters

6.130 The Committee instructed the *ad hoc* LRIT Group to consider the need for the development of guidelines to aid Contracting Governments when considering and screening applications for recognition as ASP and consider and recommend to MSC 85 the approach to be taken, on the understanding that Contracting Governments should not delay the recognition of ASPs or the authorization of ASPs to conduct conformance testing on the grounds that the Committee had not yet either decided whether such guidance was necessary or agreed any guidance to this end.

## Performance review and audit of the LRIT system

6.131 The Committee noted the discussions in relation to the review and audit of the performance of the LRIT system.

6.132 The Committee invited proposals and suggestions on the issue of the performance review and audit of the LRIT system for consideration.

6.133 The Committee advised IMSO that Contracting Governments had serious reservations in relation to the methodologies which were being considered for the determining the charges to be levied by IMSO when conducting performance review and audit of DCs and the IDE and with respect to the total cost of the performance review and audit.

6.134 The Committee, without interfering in the internal affairs of IMSO, urged those Contracting Governments which were also IMSO Parties to explore, during the deliberations of the IMSO Advisory Committee and the forthcoming session of the IMSO Assembly, how the charges to be levied by the LRIT Coordinator for conducting performance review and audit of the LRIT system could be brought down to affordable levels and apportioned in a fair and reasonable manner amongst those who have to bear the burden.

6.135 The Committee urged Contracting Governments to provide information in relation to the number of ships flying their flags which are required to transmit LRIT information and on whether they were contemplating to establish DCs and, if so, the expected date(s) of the commencement of their operations.

## Establishment of the international LRIT data exchange on an interim basis

6.136 The Committee adopted resolution MSC.264(84) on the Establishment of the international LRIT data exchange on an interim basis, set out in annex 10.

## Interim revised technical specifications for the LRIT system

6.137 The Committee approved MSC.1/Circ.1259 on Interim revised technical specifications for the LRIT system.

### Statement by the delegation of Panama

6.138 The delegation of Panama, in thanking the working group for its efforts, pointed out that the meeting had been of great importance in allaying their concerns about obtaining the tools needed to bring the LRIT system into operation. The delegation stated that they fully

expect the Panama national centre to be ready for the entry-into-force date. By 1 January 2009, at least 20% of the world fleet, namely their fleet, will be in compliance.

The delegation wished to remind other States that, for the system to function, all Contracting States must be ready for the entry into force and indicated that Panama had shown its commitment to the system from an early stage, attending all the relevant meetings and complying with all its responsibilities, such as completion of the questionnaire, and is now LRIT-compliant.

They encouraged the Contracting States to retain the existing entry-into-force date, and then through effort and cooperation, to be ready for the end of the year. The delegation stated that it was regrettable for the system and the Organization that a region representing approximately one fifth of the Contracting States informed Panama, at the beginning of the meeting, that it would not be ready to meet its responsibilities. However, that must not detract from the momentum achieved by the remaining States.

## 7 SAFETY OF NAVIGATION

### **Report of the fifty-third session of the NAV Sub-Committee**

7.1 The Committee, having recalled that MSC 83 had considered urgent matters emanating from the fifty-third session of the Sub-Committee on Safety of Navigation (NAV), approved, in general, the report of the Sub-Committee on that session (NAV 53/22 and MSC 84/7) and took action on the remaining matters as indicated hereunder.

#### Development of carriage requirements for a bridge navigational watch alarm system

7.2 The Committee noted the progress on the development of carriage requirements for a bridge navigational watch alarm system (BNWAS). The Committee also noted that at NAV 53, during the discussions that had taken place, there had been substantial support for amending SOLAS regulation V/19 for a carriage requirement of a bridge navigational watch alarm system. It had also been evident that Members were clear in their mind that carriage of BNWAS should not lead to a reduction in manning levels on the bridge. It was expected that the issue would be finalized at NAV 54.

### Guidelines for the installation of shipborne radar equipment

7.3 The Committee approved SN.1/Circ.271 on Guidelines for the installation of shipborne radar equipment. These Guidelines provide guidance for owners, ship designers, manufacturers, installers, yards, suppliers and ship surveyors.

### **Development of an e-navigation strategy**

7.4 The Committee noted and endorsed the progress made in the development of an e-navigation strategy. The Committee also noted that NAV 53 had re-established the correspondence group, which had submitted a document to COMSAR 12, raising specific questions which should be addressed by the COMSAR Sub-Committee and also prepared a final comprehensive report, including an information document for consideration by NAV 54, which was expected to complete the strategy for consideration and appropriate action by MSC 85.

# Development of mandatory carriage requirement for ECDIS

7.5 The Committee noted the progress made in the development of carriage requirement for ECDIS and that, at NAV 53, there had been a lot of arguments, both in favour and against the proposals for a mandatory carriage requirement. On the one hand, there had been support, at least "in principle" for the introduction of a carriage requirement, whilst on the other hand, concerns and questions had been raised on the necessity, feasibility and cost-effectiveness of such carriage requirements, the uncertainties of global ENC-coverage and related shortcomings in the content of ENCs, the position of developing countries, small island developing States and least developed countries and the human element and training aspects and related issues. The positive aspect of this discussion had been that it had provided the Sub-Committee with a clearer picture of the pros and cons of a carriage requirement, and this clearer picture might offer a good basis for the submission of proposals on the issue for NAV 54. It is expected that good progress will be made at NAV 54.

## **Unified interpretations of COLREGs**

7.6 The Committee approved MSC.1/Circ.1260 on the Unified interpretations of COLREGs, as guidance when applying relevant provisions of COLREGs to vessels constructed on or after 1 January 2009.

## Prevention of maritime accidents due to driftwood

7.7 The Committee, recognizing the importance of the prevention of accidents due to driftwood and other floating obstacles, approved MSC.1/Circ.1261 on Prevention of maritime accidents due to driftwood. Member States are invited to ask ships that detect driftwood and other floating obstacles (including containers, other large cargo items, etc.), which could cause a maritime accident, especially for a high-speed craft, to communicate the information to ships in the vicinity and competent authorities, in accordance with SOLAS regulation V/31.

## 8 DANGEROUS GOODS, SOLID CARGOES AND CONTAINERS

## **REPORT OF THE TWELFTH SESSION OF THE DSC SUB-COMMITTEE**

## General

8.1 The Committee approved, in general, the report of the twelfth session of the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC 12/19, DSC 12/19/Add.1, DSC 12/19/Add.2 and MSC 84/8) and took action as indicated in the ensuing paragraphs.

## **Revised EmS Guide**

8.2 The Committee approved MSC.1/Circ.1262 on Amendments to the Revised emergency response procedures for ships carrying dangerous goods (EmS Guide).

## Text of the IMDG Code downloadable from the Internet

8.3 The Committee noted that when considering issues surrounding the mandatory application of training requirements for shore-side personnel at DSC 12, some delegations were of the view that placing the complete text of the IMDG Code, in portable document format

(PDF) only, would assist in better accessibility and promotion of the provisions of the Code noting that a similar provision existed whereby the complete text of the UN Recommendations on the transport of dangerous goods was freely accessible and downloadable from the Internet.

8.4 The Director, Maritime Safety Division, invited the Committee to note that the issue of placing the complete text of the IMDG Code, as amended, had been discussed within the Secretariat and that allowing the text to be freely accessible and downloadable from the Internet was likely to have an impact on the revenue generated from the sales of the IMDG Code. Furthermore, he invited the Committee to note that such a reduction in the sales revenue was likely to affect the surplus of the Printing Fund which contributed significantly to those activities of the Organization which have a technical cooperation dimension. He emphasized that the aforementioned issue was raised at the Sub-Committee when a proposal to make the provisions of shore-side personnel training mandatory was considered, but the potential merit of the free access to the IMDG Code in the context of ensuring proper awareness of the Code requirements by shore-side personnel was not properly debated nor justified. He concluded that unless there was a compelling need for free access to the IMDG Code through the Internet from the point of view of promoting safety, it was advisable that the current policy of the Code being a sales item be maintained.

8.5 The Committee had an extensive debate on the issue which was along the lines of that which took place at DSC 12.

8.6 Having listened to the discussion on the issue, the Secretary-General expressed the view that in order to progress the matter it would be appropriate for the Committee to consider matters relating to safety aspects only and to invite the Technical Co-operation Committee (TCC) to provide its views on the impact on its activities, if any, as a result of placing the complete text of the Code on the Internet freely downloadable. He advised that the final decision should then be taken by the Council and the Assembly on the basis of the advice of the two Committees.

8.7 Subsequently, the Committee, having taken into account the outcome of the Sub-Committee, the information provided by the Director and the views of the Secretary-General, agreed to instruct the Sub-Committee to consider the merits of placing the complete text of the IMDG Code on the Internet and allowing it to be freely downloadable in the context of improving safety and prevention of pollution and to advise the Committee accordingly. Furthermore, the Committee invited the TCC to consider the connotations of the aforementioned on its activities and to advise the Council and the Assembly accordingly.

### Amendments to the marine pollutant provisions

8.8 Having noted the concurrent decision of MEPC 57, the Committee endorsed the action taken by the Sub-Committee in issuing DSC.1/Circ.54 on Information on the amendments to the marine pollutant provisions, which would take effect through the 2008 amendments to the IMDG Code (amendment 34-08) and provide a method on how to address marine pollutant-related issues from 1 January 2009 to 31 December 2009 which is the voluntary application period of the aforementioned amendment.

### Guidance on chapter 2.10 of the IMDG Code

8.9 Having noted the concurrent decision of MEPC 57, the Committee endorsed the action taken by the Sub-Committee in issuing DSC.1/Circ.55 on Guidance on the application of

chapter 2.10 (Marine Pollutants) of the IMDG Code as amended by resolution MSC.205(81) (amendment 33-06).

## Exposing containerized cargoes to elevated heat sources

8.10 The Committee noted that the Sub-Committee, having agreed to draw the attention of the Committee to the potentially serious consequences of exposing some containerized cargoes to elevated heat sources, had noted that similar discussions were currently ongoing at the UN Sub-Committee of experts on the transport of dangerous goods (UNSCOE) and agreed that it might be premature to issue a DSC circular before the outcome of the considerations at that UN Sub-Committee was completed.

## Adoption of the 2008 amendments to the IMDG Code

8.11 The Committee recalled that it had taken decisions on the adoption of the 2008 amendments to the IMDG Code (amendment 34-08) under agenda item 3 (Consideration and adoption of the amendments to mandatory instruments) (see paragraphs 3.75 to 3.77).

## International Maritime Solid Bulk Cargoes (IMSBC) Code

## Amendments to the 1974 SOLAS Convention

8.12 The Committee, having agreed to modifications, including replacing "BC Code" with "IMSBC Code", approved the draft amendments to the 1974 SOLAS Convention, set out in annex 11, and requested the Secretary-General to circulate the draft amendments in accordance with SOLAS article VIII, for consideration at MSC 85 with a view to adoption.

## Approval of, and amendments to, the draft IMSBC Code

8.13 The Committee approved the draft International Maritime Solid Bulk Cargoes (IMSBC) Code and the associated draft MSC resolution, set out in annex 12, for adoption at MSC 85 in conjunction with the adoption of the aforementioned draft SOLAS amendments and authorized the Secretariat to effect editorial corrections to the text of the draft Code, as necessary.

8.14 In this context, having considered the proposal by Japan (MSC 84/8/1) on amendments to the Foreword and section 1 of the draft IMSBC Code, the Committee forwarded them to DSC 13 for detailed consideration and, if required, submission of corresponding modifications to the text of the draft IMSBC Code to MSC 85.

8.15 Having noted the relevant decisions of DSC 12, as detailed in document DSC 12/19 (paragraphs 5.15 to 5.19), the Committee confirmed that the Code is a living document and agreed that DSC 13 should make progress on the schedules for DRI (A), DRI (B), Coal and Brown coal briquettes, development of new schedules for DRI Fines and Formed solid sulphur and modify certain parts of the draft IMSBC Code before its adoption at MSC 85.

# Application of the IMSBC Code

8.16 The Committee endorsed the recommendation of the Sub-Committee that Contracting Governments to the 1974 SOLAS Convention may apply the IMSBC Code, in whole or in part,

on a voluntary basis as from 1 January 2009 as, amongst others, the proposed voluntary application date will be the same as that of the 2008 amendments to the IMDG Code.

### Amendments to the INF Code

8.17 The Committee approved the draft amendments to the International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on Board Ships (INF Code), as amended, set out in annex 13, which are consequential in view of the envisaged mandatory IMSBC Code, and requested the Secretary-General to circulate the draft amendments, in accordance with SOLAS article VIII, for consideration at MSC 85 with a view to adoption.

### Code of Safety for Special Purpose Ships (SPS Code)

8.18 The Committee noted that the Sub-Committee had agreed to a text for inclusion in chapter 7 of the draft revised SPS Code and that it had been forwarded to the DE Sub-Committee for coordination purposes.

### Guidance on providing safe working conditions for securing of containers

### Revised Recommendation on safety of personnel during container securing operations

8.19 The Committee, having agreed to modifications to paragraph 2 and to add a new paragraph 4, as reflected in document MSC 84/WP.12, approved MSC.1/Circ.1263 on Revised Recommendation on safety of personnel during container securing operations.

### Revised Guidelines for the preparation of the cargo securing manual

8.20 The Committee noted that the Sub-Committee agreed to delay the submission to the Committee of the agreed draft Revised Guidelines for the preparation of the cargo securing manual and the associated draft MSC circular until work on the draft amendments to the CSS Code had been finalized, in order to ensure that they are approved at the same session of the Committee; to additional draft amendments to the draft Revised Guidelines for the preparation of cargo securing manual in order to make it clear that Cargo Safe Access Plan (CSAP) is only required for containerships; and that a consolidated text of the draft Revised Guidelines, containing the aforementioned draft amendments, be prepared by the Secretariat for submission to MSC 85. In that context, the Committee agreed to forward the amendments relevant to CSAP and CSM to the SLF Sub-Committee for comments and requested the Secretariat to forward them to DSC 13.

# Recommendations on the safe use of pesticides in ships applicable to fumigation of cargo holds

8.21 The Committee approved MSC.1/Circ.1264 on Recommendations on the safe use of pesticides in ships applicable to fumigation of cargo holds and endorsed the proposal of the Sub-Committee that the Recommendations should supplement the provisions of the IMSBC Code and the Grain Code.

# Recommendations on the safe use of pesticides in ships applicable to fumigation of cargo transport units

8.22 The Committee approved MSC.1/Circ.1265 on Recommendations on the safe use of pesticides in ships applicable to fumigation of cargo transport units and endorsed the recommendation of the Sub-Committee that the aforementioned Recommendations should supplement the provisions of the IMDG Code.

# Application of requirements for dangerous goods in packaged form in SOLAS and the 2000 HSC Code

8.23 The Committee noted that the Sub-Committee had finalized amendments to the SOLAS regulations II-2/1 and II-2/19, including draft revised tables 19.1 and 19.3, along with the associated draft MSC resolution; and to the 2000 HSC Code, including draft revised tables 7.17-1 and 7.17-3, along with the associated draft MSC resolution, with respect to matters falling under its purview, for referral to the FP Sub-Committee for coordination purposes.

## Document of compliance with the special requirements for ships carrying dangerous goods

8.24 The Committee approved MSC.1/Circ.1266 on Document of compliance with the special requirements for ships carrying dangerous goods under the provisions of regulation II-2/19 of the 1974 SOLAS Convention and of paragraph 7.17 of the 2000 HSC Code.

### **Documents for the E and T Group meetings**

8.25 Following the proposal by the Chairman of the Sub-Committee, the Committee, in order to facilitate the work of the Sub-Committee's E and T Group, requested the Secretariat to prepare formal documents for the consideration by the group which should be along the lines of those prepared for similar groups, such as the ESPH Working Group.

### AD HOC MECHANISM WITHIN THE IMO SECRETARIAT FOR THE RESOLUTION OF DIFFICULTIES IN THE CARRIAGE OF IMDG CODE DANGEROUS GOODS INCLUDING CLASS 7 RADIOACTIVE MATERIALS

8.26 While considering document MSC 84/8/2 (Secretariat), the Committee recalled that in pursuance of the operative paragraph 7 of resolution A.984(24), which requested the Secretary-General to explore the possibility of establishing an *ad hoc* mechanism within the Organization to coordinate efforts to speedily resolve difficulties in the carriage of IMDG Code class 7 radioactive materials, in close cooperation with the IAEA, the Secretary-General had established a focal point on the resolution of such difficulties, and that MSC 83 had requested the Secretariat to keep it informed of the progress made on that mechanism.

8.27 The Committee noted that, in order to facilitate the monitoring and coordination of the resolution of such difficulties, IMO had established a Dangerous Goods Carriage Database (DGCD) where all reports on delays and denials are logged in. Access to this database is open to all UN bodies concerned, on a request basis, and so far the IAEA has been granted access to it with the view to logging data relevant to matters under its purview. The Committee also noted that at the time of preparing document MSC 84/8/2, 18 reports on delays and denials of class 7 radioactive materials in sea mode had been received and these had been entered in the database. A preliminary analysis of the reports, undertaken by the Secretariat, which did not provide all the requested information in a number of cases, revealed that the majority of the reports concern

refusals by carriers or port authorities to accept class 7 radioactive materials, as it becomes apparent that they have a policy in place of non-acceptance of class 7 radioactive materials; however, a small number of radioactive materials are accepted only for certain destinations. The Committee noted that the above analysis was subject to confirmation by a further detailed analysis of the reports that will be conducted jointly by the Secretariats of the three Agencies (IMO, IAEA and ICAO), taking into account the relevant decisions of the IMO bodies and other bodies concerned, as appropriate.

8.28 The Director, Maritime Safety Division, informed the Committee that since the receipt of the above-mentioned 18 reports, the Secretariat had received another 17 reports which are being analysed by the Secretariat.

8.29 The Committee noted the information provided and agreed that the Secretariat should continue to take part in the meetings of the International Steering Committee and other relevant meetings of the IAEA and keep the Committee informed of the outcome of the *ad hoc* mechanism and urged Member States to continue to take steps to facilitate the shipments of all dangerous goods, particularly those class 7 radioactive materials, the use of which has a humanitarian dimension.

8.30 The Committee noted the information provided by the delegation of Argentina regarding an invitation to attend the 12th International Congress of the International Radiation Protection Association (IRPA 12), which will take place in Buenos Aires, Argentina, in October 2008 and agreed that the Secretariat should participate in the congress.

### **BULK CARRIER LOADING RATES**

8.31 INTERCARGO provided information (MSC 84/INF.8) on a recent survey of ships' masters conducted as part of an ongoing investigation into high loading rates of bulk carriers, highlighting that many of the issues raised by the survey were subject to further investigation and that it was evident that the BLU Code was not being universally applied.

8.32 The Committee, having thanked INTERCARGO for the information provided, referred document MSC 84/INF.8 to DSC 13 for information purposes and invited INTERCARGO to consider submitting that information, along with other relevant findings with the view to developing risk reduction measures, to the Sub-Committee for detailed consideration.

## 9 FIRE PROTECTION

## **REPORT OF THE FIFTY-SECOND SESSION OF THE SUB-COMMITTEE**

## General

9.1 The Committee approved, in general, the report of the fifty-second session of the Sub-Committee on Fire Protection (FP) (FP 52/21 and MSC 84/9) and took action as indicated hereunder.

# Equivalent fixed gas fire-extinguishing systems for machinery spaces and cargo pump-rooms

9.2 The Committee approved MSC.1/Circ.1267 on Amendments to the Revised Guidelines for the approval of equivalent fixed gas fire-extinguishing systems, as referred to in SOLAS 74,

for machinery spaces and cargo pump-rooms (MSC/Circ.848). In this context, the Committee noted the view expressed by the delegation of Sweden that guidance should be developed on the method to determine the No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL) values and, in this regard, they informed the Committee of their intention to submit a document to MSC 85, proposing to expand the Sub-Committee's work programme item on "Performance testing and approval standards for fire safety systems" to include development of the above guidance.

## Fixed fire-extinguishing systems for cabin balconies

9.3 The Committee approved MSC.1/Circ.1268 on Guidelines for the approval of fixed pressure water-spraying and water based fire-extinguishing systems for cabin balconies.

## Sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12

9.4 The Committee adopted resolution MSC.265(84) on Amendments to the Revised Guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12 (resolution A.800(19)), set out in annex 14, having endorsed the decision of the Sub-Committee that the amendments should apply only to new approvals for equivalent sprinkler systems and that existing type approvals already issued to confirm compliance with the present Revised Guidelines (resolution A.800(19)) should remain valid for six years after 1 July 2009.

# Equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms

9.5 The Committee approved MSC.1/Circ.1269 on Amendments to the Revised Guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms (MSC/Circ.1165).

# Fixed aerosol fire-extinguishing systems equivalent to fixed gas fire-extinguishing systems for machinery spaces

9.6 The Committee approved MSC.1/Circ.1270 on Revised Guidelines for the approval of fixed aerosol fire-extinguishing systems equivalent to fixed gas fire-extinguishing systems, as referred to in SOLAS 74, for machinery spaces.

# High-expansion foam using inside air for the protection of machinery spaces and cargo pump-rooms

9.7 The Committee approved MSC.1/Circ.1271 on Guidelines for high-expansion foam using inside air for the protection of machinery spaces and cargo pump-rooms, and endorsed the Sub-Committee's decision that the Guidelines should be effective on 1 July 2009.

## Fixed water-based fire-fighting systems for ro-ro spaces and special category spaces

9.8 The Committee approved MSC.1/Circ.1272 on Guidelines for the approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces equivalent to that referred to in resolution A.123(V), and, having noted the Sub-Committee's agreement that the Guidelines should be implemented as soon as possible to allow the industry to begin installing

such systems, decided that the Guidelines should apply when approving fixed-based fire-fighting systems for ro-ro spaces and special category spaces on or after 1 June 2008.

## Amendments to SOLAS regulation II-2/10

9.9 The Committee approved the draft amendments to SOLAS regulation II-2/10, set out in annex 15, regarding recharging requirements and the appropriate number of spare charges for the required breathing apparatus, and requested the Secretary-General to circulate the proposed amendments, in accordance with SOLAS article VIII, for consideration, with a view to adoption, at MSC 85.

## Performance testing and approval standards for fire-safety systems

9.10 The Committee noted that the Sub-Committee had approved the revised work plan for the development of performance testing and approval standards for fire-safety systems, and had invited Member Governments and international organizations to submit, to FP 53, their views on how to deal with this long-term work item.

### Amendments to SOLAS regulation II-2/9

9.11 The Committee approved the draft amendments to SOLAS regulation II-2/9, set out in annex 15, concerning the control of the installation of fire doors with three-sided frames, noting that these amendments should apply to new ships only, and requested the Secretary-General to circulate the proposed amendments, in accordance with SOLAS article VIII, for consideration, with a view to adoption, at MSC 85.

## Unified interpretations of the FTP Code

9.12 The Committee approved MSC.1/Circ.1273 on Unified interpretations of the International Code for Application of Fire Test Procedures (FTP Code).

## Evaluation of fire risk of external areas on passenger ships

9.13 The Committee approved MSC.1/Circ.1274 on Guidelines for evaluation of fire risk of external areas on passenger ships, developed in response to the cabin balcony fire on board the **Star Princess** to ensure the fire safety of external areas.

### Amendments to SOLAS regulation II-2/9.7

9.14 The Committee approved the draft amendments to SOLAS regulation II-2/9.7, set out in annex 15, on matters related to fire resistance of ventilation ducts, and requested the Secretary-General to circulate the proposed amendments, in accordance with SOLAS article VIII, for consideration, with a view to adoption, at MSC 85.

### **Review of the SPS Code**

9.15 The Committee noted that the Sub-Committee had agreed to chapter 6 of the draft SPS Code relating to fire protection, for referral to the DE Sub-Committee for coordination purposes.

# Amendments to SOLAS chapter II-2

9.16 The Committee approved the draft amendments to SOLAS chapter II-2, set out in annex 15, concerning the application of requirements for the carriage of dangerous goods, and requested the Secretary-General to circulate the proposed amendments, in accordance with SOLAS article VIII, for consideration, with a view to adoption, at MSC 85. In this respect, the Committee, following the recommendation of the Sub-Committee, instructed DSC 13 to consider the draft amendments and submit its comments to MSC 85.

## Amendments to the 2000 HSC Code

9.17 The Committee approved, in principle, the draft amendments to the 2000 HSC Code, set out in annex 16, concerning the application of requirements for the carriage of dangerous goods, and requested the Secretary-General to circulate the proposed amendments, in accordance with SOLAS article VIII, for consideration, with a view to adoption, at MSC 85. As advised by the Sub-Committee, the Committee instructed DSC 13 to consider the draft amendments and submit its comments to MSC 85.

## Underdeck stowage of dangerous goods

9.18 The Committee considered the Sub-Committee's recommendation that generic requirements on prohibition of underdeck stowage of "class 2.3 having subsidiary risk class 2.1" and "class 4.3 liquids having a flashpoint less than 23°C" be incorporated in the IMDG Code and, having noted that the IMDG Code restricts underdeck stowage on a product-by-product basis and not by a generic prohibition, decided not to instruct the DSC Sub-Committee to consider incorporating such requirements in the IMDG Code.

## Unified interpretations on the number and arrangement of portable fire extinguishers

9.19 The Committee, after having made a minor modification, approved MSC.1/Circ.1275 on Unified interpretations of SOLAS chapter II-2 on the number and arrangement of portable fire extinguishers on board ships.

## **Development of provisions for gas-fuelled ships**

9.20 The Committee noted that the Sub-Committee had reviewed the fire protection-related aspects of the draft Interim Guidelines on safety for gas-fuelled engine installations in ships, prepared by BLG 11 and, subsequently, had decided to refer the matter to a correspondence group for detailed consideration.

## **Unified interpretations of SOLAS chapter II-2**

9.21 The Committee approved MSC.1/Circ.1276 on Unified interpretations of SOLAS chapter II-2.

### **Revision of the Code on Alarms and Indicators**

9.22 The Committee noted that the Sub-Committee had agreed to the proposed amendments to the parts of the draft Revised Code on Alarms and Indicators, related to fire safety, for referral to DE 51 for coordination purposes.

## Long-term availability of halons

9.23 The Committee noted the information on the outcome of the nineteenth meeting of the Parties to the Montreal Protocol and the request of the UNEP representative for IMO to assist UNEP in its efforts to collect data on halons from the maritime sector, in particular, to encourage Member States to collect data on the number of halon systems still in use on board their ships and the total amount of halons in their respective merchant fleets, and to convey this information to the UNEP Ozone Secretariat. The Committee agreed to deal with this matter in detail under agenda item 20 (Relations with other organizations).

# Measures to prevent explosions on oil and chemical tankers transporting low-flashpoint cargoes

9.24 The Committee noted that the Sub-Committee, having noted views expressed during discussion on the subject, had decided to establish a working group at FP 53 to progress the matter and had urged Member Governments and international organizations to submit the essential data on the subject to FP 53 for consideration and action, as appropriate. In this regard, the delegation of France, which drew the Committee's attention to the Sub-Committee's request for additional information on costs, the human element and other factors that justify the concern to propose new measures intended to prevent explosions, expressed the view that the Sub-Committee's mandate was for completion in 2009 with a view to proposing measures (and not discussing their advisability) for new ships in the first instance, and thereafter, of considering the measures that could be applied to existing ships.

### **OTHER MATTERS**

# Revised standards for the design, testing and locating of devices to prevent the passage of flame into cargo tanks in tankers

9.25 The Committee noted information on the status of ongoing standardization work within ISO with regard to pressure/vacuum valves for cargo tanks (MSC 84/INF.11), which is referenced in circular MSC/Circ.1009 (Amendments to the Revised standards for design, testing and locating of devices to prevent the passage of flame into cargo tanks in tankers (MSC/Circ.677)), and decided to forward the document to FP 53 for information purposes.

## 10 BULK LIQUIDS AND GASES

### **REPORT OF THE TWELFTH SESSION OF THE BLG SUB-COMMITTEE**

### General

10.1 The Committee approved, in general, the report of the twelfth session of the Sub-Committee on Bulk Liquids and Gases (BLG) (BLG 12/17, BLG 12/17/Add.1 and MSC 84/10) and took action as indicated in the ensuing paragraphs.

### Development of provisions for gas-fuelled ships

10.2 The Committee noted the progress made by the Sub-Committee on the development of the provisions and, in particular, that the Sub-Committee had confirmed that, in furthering the development of these provisions, it would be appropriate to have a two-step approach with the first set of the provisions developed to be applicable to LNG-fuelled ships only.

10.3 The Committee agreed with the view of the delegation of France that in the context of reducing the generation of SOx gases when furthering the development of provisions for gas-fuelled ships, the relevant provisions of MARPOL Annex VI, as amended, should be taken into account.

### Review of the Recommendation for material safety data sheets (MSDSs) for MARPOL Annex I cargoes and marine fuel oils

10.4 The Committee noted the outcome of the consideration of issues relevant to MSDSs in the context of review of the Recommendation for material safety data sheets for MARPOL Annex I cargoes and marine fuel oils and the progress made in the context of amendments to Annex to resolution MSC.150(77), in particular that the Sub-Committee, having deliberated the matter in depth, established a correspondence group to, *inter alia*, review annex 2 of resolution MSC.150(77) with regard to the appropriate information to be provided in the Material Safety Data Sheets and parameter-related matters and to prepare a consolidated text of the revised annexes 1 and 2 of the resolution for consideration at BLG 13.

## Inconsistencies between SOLAS regulation VI/1 and new regulation VI/5-1

10.5 The Committee noted that it had taken decisions, regarding the inconsistencies between SOLAS regulation VI/1 and new regulation VI/5-1, under agenda item 3 (Consideration and adoption of amendments to mandatory instruments).

### Intersessional meeting of the ESPH Working Group

10.6 Having noted that MEPC 57 had agreed that the intersessional meeting of the ESPH Working Group should be held some time in 2009, the Committee approved the holding of the meeting of the group in 2009.

## Device to prevent passage of flame into cargo tanks

10.7 The delegation of Denmark expressed the view that it should be evident that all chemical tankers as well as other ships should only carry cargoes for which they are constructed, equipped and approved. In the view of that delegation, no product should, therefore, be included in the International Pollution Prevention Certificate for the carriage of noxious liquid substances in bulk, unless the ship was designed and capable of a safe carriage of such products. The delegation, referring to the report of BLG 12 (paragraphs 16.19 to 16.23), expressed its disappointment that despite clear instructions from MSC 83, including a clear conclusion on the matter by the FP Sub-Committee, BLG 12 had decided to postpone a clarification of this important issue till the next session of the Sub-Committee, mainly because of an intervention by an observer from a non-governmental organization expressing a need for further considerations. The Danish delegation expressed its concern that this further delay may have serious impacts on the safety of the chemical carriers involved.

## 11 SHIP DESIGN AND EQUIPMENT

### URGENT MATTERS EMANATING FROM THE FIFTY-FIRST SESSION OF THE SUB-COMMITTEE

### General

11.1 The Committee considered urgent matters referred to it (document MSC 84/11) emanating from the fifty-first session of the Sub-Committee (DE 51/28) and took action as indicated hereunder.

### Amendments to the ESP Guidelines (resolution A.744(18))

11.2 The Committee noted the progress made regarding the development of amendments to the ESP Guidelines (resolution A.744(18)), in particular that DE 51 had established a correspondence group and instructed it to harmonize the part on single-side skin bulk carriers with the newly developed part on double-side skin bulk carriers; review the Guidelines to harmonize them with the IACS Z10 series; and prepare amendments to permit the master or a representative nominated by the master or company to attend the survey planning meeting.

### Code of Safety for Special Purpose Ships, 2008

11.3 The Committee considered the draft Code of Safety for Special Purpose Ships (SPS Code), 2008 (DE 51/28, annex 1) and the related document MSC 84/11/7 (Netherlands), proposing amendments to the definition of "special personnel" in paragraph 1.3.3.2 of the draft revised SPS Code regarding the training programme to be approved by the Administration and the deletion of the footnote to paragraph 1.3.12 referring to sail training ships not propelled by mechanical means.

11.4 Following debate, the Committee, with regard to the proposals outlined in the above paragraph, did not support the proposals to amend the definition of "special personnel" and to delete the footnote to paragraph 1.3.12.

11.5 The delegation of Italy, supported by some other delegations, pointed out that paragraph 1.2.3 of chapter 1 of the draft 2008 SPS Code, concerning the transport of industrial personnel not working on board, excluded the application of the Code to ships that transport technicians working on board offshore platforms. They were of the opinion that the SPS Code should apply to ships that carry those working on offshore units since these workers may be compared with special personnel. Although these workers did not carry out any activities on board the ships that carried them, they were trained in fire-fighting and in the use of life-saving appliances on the basis of the safety rules applicable to the offshore units on which they worked and had a better training than, e.g., scientists and technicians engaged in research activities. The Italian delegation, therefore, was of the view that paragraph 1.2.3 should be deleted because it was not desirable to exclude these types of ships from the scope of application of the SPS Code.

11.6 The Committee, having noted that the matter had been extensively discussed by the Sub-Committee and was not supported, and comments made during the discussion in plenary, did not agree to the proposal to delete paragraph 1.2.3 of the draft 2008 SPS Code concerning the transport of industrial personnel not working on board, but recommended that interested delegations should consider submitting a proposal for a new work programme item with regard to the transport of industrial personnel on offshore support vessels to the Committee, in accordance with the Guidelines on the organization and method of work.

11.7 Consequently, the Committee adopted resolution MSC.266(84) on Code of Safety for Special Purpose Ships, 2008, set out in annex 17.

## **Revision of the Code on Alarms and Indicators**

11.8 The Committee noted the outcome of the Sub-Committee's work on the revision of the Code on Alarms and Indicators, in particular that further work on the revision of the Code was necessary and that IACS (who prepared the first version of the revision) had been requested to prepare the final draft revised Code on Alarms and Indicators for submission to DE 52, changing the references to the 1989 MODU Code in the draft revised Code to refer to the relevant paragraphs of the draft revised MODU Code (see paragraph 11.9) and incorporating the outcome of DSC 12 and FP 52.

## Amendments to the MODU Code

11.9 The Committee noted the progress made on the development of amendments to the MODU Code, in particular the Sub-Committee's decision to prepare a complete revised Code for finalization at DE 52, when the outstanding contributions from the COMSAR and FP Sub-Committees would be available.

## Life-saving appliances and related matters

# Interim Recommendation on conditions for authorization of service providers for lifeboats, launching appliances and on-load release gear

11.10 The Committee considered the draft Interim Recommendation on conditions for authorization of service providers for lifeboats, launching appliances and on-load release gear, in connection with document MSC 84/11/1 (Secretariat), containing, as requested by DE 51, the view of IMO's Legal Division with regard to the inclusion of provisions for manufacturers in paragraph 4 of the draft Interim Recommendation and a proposal for a rewording of those provisions, requesting Administrations to take measures to ensure compliance by manufacturers.

11.11 The observer from IACS, supported by a number of delegations, stated that, in their opinion, while this matter is only addressed in non-mandatory guidance, there will be problems in terms of uniformity in global implementation. The long-term objective should, therefore, be to amend the relevant provisions of SOLAS chapter III to address this issue.

11.12 Following debate, the Committee supported the proposal to replace paragraph 4 of the draft Interim Recommendation, in principle, and, having agreed to the modified text of the paragraph, approved MSC.1/Circ.1277 on Interim Recommendation on conditions for authorization of service providers for lifeboats, launching appliances and on-load release gear.

## Global coverage of lifeboat service providers

11.13 The Committee noted that the Sub-Committee had requested ILAMA to report to DE 52 on the establishment of adequate global coverage of suitable lifeboat service providers, including coordination with non-ILAMA members, and on the availability of training for certification of service personnel.

## Amendments to the LSA Code

11.14 The Committee approved draft amendments to the LSA Code, set out in annex 18, relating to the change of the average weight of seafarers, specified in the Code, from 75 kg to 82.5 kg, and requested the Secretary-General to circulate the draft amendments, in accordance with SOLAS article VIII, for consideration, with a view to adoption, at MSC 85.

## Amendments to the Revised recommendation on testing of life-saving appliances

11.15 The Committee approved, in principle, a draft MSC resolution on Adoption of amendments to the Revised recommendation on testing of life-saving appliances (resolution MSC.81(70)), set out in annex 19, for formal adoption in conjunction with the adoption of the draft amendments to the LSA Code referred to in paragraph 11.14 above.

## Lifeboat on-load release gear

11.16 The Committee noted the outcome of the Sub-Committee's work regarding lifeboat on-load release gear, in particular that, due to time constraints, this matter could not be considered in sufficient detail and that, therefore, DE 51 had instructed the LSA Correspondence Group to further consider, as a matter of priority, the "fail safe" concept and the use of fall preventer devices and to finalize relevant amendments to the LSA Code and the Revised recommendation on testing of life-saving appliances (resolution MSC.81(70)); and also to develop a definition for "on-load release hooks of poor and unstable design", explore criteria to determine poor and unstable design of such hooks and consider a timeframe for the replacement of such hooks.

## Guidance on wearing immersion suits in totally enclosed lifeboats

11.17 The Committee approved MSC.1/Circ.1278 on Guidance on wearing immersion suits in totally enclosed lifeboats.

## Guidelines for the approval of novel life-saving appliances

11.18 The Committee noted the outcome of the Sub-Committee's work on guidelines for the approval of novel life-saving appliances, in particular the decision to develop relevant provisions when revising SOLAS chapter III under the work programme item on "Development of a new framework of requirements for life-saving appliances".

## **Corrosion protection**

## Guidelines on maintenance and repair of protective coatings

11.19 The Committee noted the progress made on the development of guidelines on maintenance and repair of protective coatings and also that, in this context, the Sub-Committee had noted the Industry Guidelines for the implementation of the Performance standards for protective coatings (PSPC), adopted by resolution MSC.215(82), and had found their application to be beneficial for Administrations, industry and other parties concerned.

11.20 In this connection, the Committee considered document MSC 84/11/6 (IACS), providing, in the annex to the document, IACS Unified Interpretation SC 222 which clarifies how

IACS Members intend to uniformly interpret the provisions of the above Performance standard for protective coatings in relation to salt measurement and stripe coatings.

11.21 The Committee supported the proposed Unified Interpretation (UI) in general and, following a proposal by the delegation of Greece, invited IACS to amend the first part of the UI concerning stripe coats by adding the following sentence at the end of the interpretation:

"A roller may be used for scallops, ratholes, etc., but not for edges and welds."

11.22 The IACS observer advised the Committee that the UI would be amended in line with the above proposal and would be submitted to DE 52 under the agenda item "Consideration of IACS unified interpretations" for consideration and action as appropriate.

# Guidelines for corrosion protection of permanent means of access arrangements

11.23 The Committee approved MSC.1/Circ.1279 on Guidelines for corrosion protection of permanent means of access arrangements.

## Definition of the term "bulk carrier"

11.24 The Committee noted the outcome of the Sub-Committee's work regarding the definition of the term "bulk carrier" and, in particular, that DE 51, having agreed that further work should be undertaken to finalize the matter, had invited the Committee to include a relevant item in the Sub-Committee's work programme and the provisional agenda for DE 52.

11.25 In this regard, the Committee had for its consideration the following documents:

- .1 MSC 84/11/2 (Norway), submitting in the annex to their document a draft MSC resolution on Revised interpretation of the term "bulk carrier" as defined in SOLAS regulation IX/1.6, based on the one prepared by the group of experts at DE 51 (DE 51/WP.8), and requesting the Committee to thoroughly debate the matter as a priority, with a view to resolving it at this session;
- .2 MSC 84/11/3 (Secretariat), presenting pertinent background information and proposals for a way forward, in particular advising that a drafting group could be established to prepare the final text of the draft resolution for adoption at this session, so that the Committee may resolve the matter in principle, while any remaining work could be deferred to DE 52;
- .3 MSC 84/11/4 (Chairman of the DE Sub-Committee), providing background information on the discussions in the DE Sub-Committee on the issue and supporting the establishment of a drafting group at this session;
- .4 MSC 84/11/5 (CESA), commenting on the draft MSC resolution as attached to document MSC 84/11/2, in particular the proposed operative paragraph 1.3.2, and recommending that the alternative approach to define design specifics indicating that a ship is primarily used for non-bulk cargoes should be further explored; and
- .5 MSC 84/11/8 (INTERCARGO), commenting on the draft MSC resolution as attached to document MSC 84/11/2 and, in particular, expressing the view that this approach provides a sound basis for further consideration and that the

# clarification of the definition is an urgent matter in order to provide clarity for the industry.

11.26 The observer from ICS stressed the need for a rapid solution to the issue, i.e., the development of an appropriate definition of the term "bulk carrier", in order to provide for the correct application of SOLAS chapter XII. In his opinion, the draft MSC resolution proposed by Norway (MSC 84/11/2) could form the basis for such solution but needed further detailed consideration with special attention paid to smaller ships on marginal routes which only occasionally carried bulk cargoes. However, the observer emphasized that, for such discussion, a proper working group needed to be established.

11.27 While several other delegations supported the ICS statement, having also stressed the need for urgent action on the issue, advocating that the matter should preferably be resolved at this session, however, some other delegations were of the view that the debate should be postponed until a proper working group could be formed to consider the matter.

11.28 The delegation of the Cook Islands pointed out that the definition proposed by Norway seemed to favour special types of double-hull ships and could have a detrimental effect on developing countries and, in particular, small island States. In this context, several other delegations indicated their concern that a definition of the term "bulk carrier" might have a negative impact on developing countries and that it would be premature to resolve the matter at this session. They suggested, instead, that an intersessional working group could consider the issue with a view to finalization.

11.29 Referring to the item on "General cargo ship safety" on the Committee's agenda, the delegation of the Bahamas suggested that this item was closely related to the issue and that a definition for the term "bulk carrier" could be developed in conjunction with the work on the definition of the term "general cargo ship".

11.30 Consequently, the Committee agreed that it would not attempt to resolve the matter at this session but would instead consider, under agenda item 22 (Work programme), the establishment of the working group to deal with the matter.

## **12 TRAINING AND WATCHKEEPING**

### URGENT MATTERS EMANATING FROM THE THIRTY-NINTH SESSION OF THE SUB-COMMITTEE

### General

12.1 The Committee considered urgent matters referred to it (MSC 84/12) emanating from the thirty-ninth session of the Sub-Committee (STW 39/12) and took action as indicated hereunder.

## Comprehensive review of the STCW Convention and the STCW Code

12.2 The Committee:

- .1 noted the progress of work relating to the comprehensive review of the STCW Convention and the STCW Code;
- .2 noted and agreed, in principle, to the proposal to hold a conference to adopt amendments to the STCW Convention and the STCW Code emanating from the comprehensive review and to advise C 100 accordingly;

- .3 agreed to the schedule of meetings relating to the comprehensive review of the STCW Convention and the STCW Code, as set out in annex 1 to document STW 39/12; and
- .4 approved the convening of an *ad hoc* intersessional working group in September 2008 to progress work on the comprehensive review.

12.3 In light of the foregoing, the Committee invited the Council to endorse, in principle, holding a diplomatic conference in 2010 to adopt amendments emanating from the comprehensive review and to make, in due course, appropriate appropriations in the budget for the next biennium.

12.4 The Committee recalled that, under agenda item 15 (Role of the human element), it had referred document STW 39/6/1 to the Joint MSC/MEPC Working Group on Human Element for detailed consideration and advice on the way forward as reflected in paragraph 15.25.

## Areas in chapter VI of the STCW Code where training cannot be conducted on board

12.5 The Committee, in considering the list of areas in chapter VI of the STCW Code where training cannot be conducted on board, as developed by STW 39, also considered the proposal by Norway (MSC 84/12/2) that the STW Sub-Committee should be instructed to consider measures to ensure compliance with the requirements in the STCW Convention with a view to maintaining professional competence in accordance with section A-I/11 of the STCW Code, in areas where training cannot be conducted on board.

12.6 A number of delegations supported the proposal by Norway that STW 40 should be instructed to consider measures to ensure compliance with the requirements in the STCW Convention, to maintain professional competence in accordance with section A-I/11 of the STCW Code, in areas where training cannot be conducted on board.

12.7 Some delegations expressed the view that training in these areas to maintain continued proficiency in basic training, should be the responsibility of the companies under section 6 of the ISM Code through the Company's safety management system (SMS), and could also be included in STCW regulation I/14 (Responsibilities of companies). One delegation expressed the opinion that demonstration of professional competence should be on a continuous basis and that STW 40 should be instructed to clearly identify these areas, which could then form a part of the Company's SMS.

12.8 Accordingly, the Committee approved the list of areas where training cannot be conducted onboard and instructed the Sub-Committee to consider measures to ensure compliance with the requirements in the STCW Convention, to maintain professional competence in these areas.

## Review of the principles for establishing the safe manning level of ships

12.9 The Committee noted the progress of work relating to the review of the principles for establishing the safe manning level of ships.

## PREPARATION OF REPORTS PURSUANT TO STCW REGULATION I/7, PARAGRAPH 2

## Secretary-General's report to the Committee

12.10 In introducing his report (MSC 84/WP.2), the Secretary-General advised the Committee that in preparing the reports required by STCW regulation I/7, paragraph 2, he had solicited and I:\MSC\84\24.doc
taken into account the views of the competent persons selected from the list established pursuant to paragraph 5 of the regulation and circulated as MSC.1/Circ.797. The report, as required by MSC.1/Circ.796/Rev.1, was comprised of:

- .1 the Secretary-General's report to the Committee;
- .2 a description of the procedures followed;
- .3 a summary of the conclusions reached in the form of a comparison table; and
- .4 an indication of the areas which were not applicable to the Government concerned.

12.11 The Committee was subsequently invited to consider the reports attached to document MSC 84/WP.2 for the purpose of confirming that the information provided by those Governments concerned demonstrated that full and complete effect was given to the provisions of the STCW Convention.

12.12 As was the case with the Secretary-General's reports to its previous sessions, the Committee agreed to consider the reports in order to:

- .1 identify, from the Secretary-General's report, the scope of information evaluated by the panels;
- .2 review the procedures report to identify any entries requiring clarification;
- .3 review the information presented in comparison table format to ensure that it was consistent with the Secretary-General's report; and
- .4 confirm that each report reflected that the procedures for the assessment of the information provided by the Governments concerned had been correctly followed.

12.13 The Committee confirmed that the procedures for the assessment of the information provided had been correctly followed in respect of the two STCW Parties whose information had not been evaluated previously and another STCW Party, which had communicated additional information, included in the Secretary-General's report and requested the Secretariat to update MSC.1/Circ.1163/Rev.2 accordingly and issue it as MSC.1/Circ.1163/Rev.3.

### SECRETARY-GENERAL'S REPORT PURSUANT TO STCW REGULATION I/8

12.14 In introducing his report (MSC 84/WP.2/Add.1), the Secretary-General advised the Committee that, in preparing the reports required by STCW regulation I/8, paragraph 2, he had solicited and taken into account the views of the competent persons selected from the list established pursuant to paragraph 5 of the regulation and circulated as MSC.1/Circ.797. Each report, as required by MSC.1/Circ.997, was comprised of:

- .1 the Secretary-General's report to the Committee;
- .2 a description of the procedures followed; and
- .3 a summary of the conclusions reached in the form of a comparison table.

12.15 The Committee was subsequently invited to consider the reports attached to document MSC 84/WP.2/Add.1 for the purpose of confirming that the information provided by the STCW Parties pursuant to STCW regulation I/8 demonstrated that full and complete effect was given to the provisions of the STCW Convention.

12.16 As was the case with the Secretary-General's reports to its previous sessions, the Committee agreed to consider each Party report individually in order to:

- .1 identify, from the Secretary-General's report, the scope of information evaluated by the panels;
- .2 review the procedures report to identify any entries requiring clarification;
- .3 review the information presented in comparison table format; and
- .4 confirm that each report reflected that the procedures for the assessment of the information provided by the Parties concerned had been correctly followed.

12.17 The Committee confirmed that the procedures for the assessment of information provided had been correctly followed in respect of three STCW Parties and requested the Secretariat to update MSC.1/Circ.1164/Rev.3 accordingly and issue it as MSC.1/Circ.1164/Rev.4.

## **APPROVAL OF COMPETENT PERSONS**

12.18 The Committee approved additional competent persons nominated by Governments (MSC 84/12/1) and requested the Secretariat to update MSC.1/Circ.797/Rev.15 accordingly and issue the updated circular as MSC.1/Circ.797/Rev.16.

## **13 GENERAL CARGO SHIP SAFETY**

13.1 The Committee recalled that MSC 83 (MSC 84/13), following consideration of the documents submitted to the session, had agreed that more detailed analysis of the cause of accidents involving general cargo ships (in particular, the outcomes of the SURSHIP project and the study being undertaken by the Republic of Korea) is needed to facilitate the identification of the problem areas for such ships, bearing in mind the variety of ship types covered by the category of general cargo ships. Consequently, MSC 83 agreed that a working group should be established at a future session with the preliminary terms of reference set out in paragraph 1.3 of document MSC 84/13 and invited Member Governments and international organizations to submit, to MSC 84, further information and relevant proposals on the matter, taking into account that several studies on this subject were ongoing.

13.2 Following discussion on best way to proceed on the matter in light of the information received to date, the Committee agreed, in principle, that:

- .1 there was an urgent need to consider the safety of general cargo ships, taking into account the current safety level of these types of ships and the documents submitted to date on the matter;
- .2 more detailed casualty information on the cause of accidents involving general cargo ships was needed to progress the matter, including the outcome of any related studies;

- .3 that the definition of the terms "bulk carrier" and "general cargo ship" are interrelated and therefore any outcome of discussion on the definition of "bulk carrier" under the provisions of the SOLAS Convention should be taken into account in the discussion of the definition of "general cargo ship"; and
- .4 any FSA studies submitted on the matter should first be reviewed by the FSA Group of Experts before establishing a working group on general cargo ship safety (see also paragraph 16.2),

and invited Member Governments and international organizations to submit further information and the relevant proposals on the issue to MSC 85.

## 14 CAPACITY-BUILDING FOR THE IMPLEMENTATION OF NEW MEASURES

## General

14.1 The Committee recalled that, at MSC 82, it had considered a proposal (MSC 82/20/1) that the Committee and all its sub-committees should ensure that, when developing new instruments or amending existing ones, where necessary, guidance for implementation is prepared and that issues requiring the provision of technical assistance prior to implementation are identified. Whilst supporting the proposal, the Committee recognized that the issue was not only relevant to the Committee and its sub-committees but also to other Committees (MEPC, FAL Committee and LEG Committee) as well as the Assembly and diplomatic conferences.

14.2 The Committee recalled also that at MSC 83, having considered document MSC 83/18/1 (South Africa) it had agreed that, as a matter of policy, the Committee must insert a criteria in its method of work requiring that Member States and organizations with observer status, when proposing development of new instruments or proposing amendment to existing instruments, identify capacity implications. MSC 83 had requested the Secretariat to prepare draft amendments to the Committees' Guidelines to that effect and submit these to MEPC 57 and MSC 84 for consideration. MSC 83 had also agreed, in principle, to establish, at MSC 84, an *ad hoc* working group on capacity-building and technical cooperation for the implementation of new instruments and had submitted a draft Assembly resolution on Need for capacity-building for the development and implementation of new, and amendments to existing, instruments for submission to A 25 for adoption.

14.3 The Committee noted that the Assembly, at its twenty-fifth session, had noted the outcome of MSC 83 on the issue of capacity-building for the implementation of new measures, and adopted resolution A.998(25) on Need for capacity-building for the development and implementation of new, and amendments to existing, instruments. The Committee noted, in particular, that by resolution A.998(25), the Assembly recommended, *inter alia*, that the committees should establish a mechanism to identify new instruments requiring the provision of technical assistance prior to implementation (operative paragraph 3 of the resolution) and instructed all IMO organs, under the coordination of the Council, to make arrangements, within their work, so as to enable as many Member States as possible to participate actively in the work of such organs (operative paragraph 4 of the resolution).

14.4 The Committee noted that MEPC 57 had also noted the adoption of resolution A.998(25), and, in particular, operative paragraphs 3 and 4 of the resolution.

## Draft amendments to the Committees' Guidelines

14.5 The Committee noted that the Secretariat (MSC 84/14) had reviewed the current Committees' Guidelines (MSC-MEPC.1/Circ.1) with a view to include necessary provisions to reflect the decisions of MSC 83 and had proposed that the following elements should be reflected in modifications to the current Committees' Guidelines:

- .1 a general statement that the Committees should assess the implications for capacity-building and technical cooperation, before establishing a new work programme concerning proposals for new, or amendments to existing, instruments;
- .2 modifications to the format for submission of proposals for new items, requesting the proposer of a new item to provide necessary information regarding the need for capacity-building; and
- .3 a set of criteria against which the Committees may wish to identify new instruments requiring the provision of technical assistance prior to implementation; issues requiring special focus when developing technical cooperation and assistance activities relating to the implementation of new measures; and new instruments requiring a simplified guide for implementation, as recommended by the Assembly (operative paragraph 3 of resolution A.998(25)).

14.6 During the discussion, while the majority of delegations supported the draft amendments to the Committees' guidelines (MSC 84/14, annex 2), some delegations expressed concern and practical difficulty that it would be difficult to provide an assessment of capacity-building required for the Administration when proposing a work programme for new instruments and this should be done by the Committee when considering a new work programme item. Some delegations also expressed the view that such an assessment should be carried out during the course of the development of new instruments and not before establishing a new work programme item.

14.7 Having exchanged views on the draft amendments, the majority of the Committee agreed, in principle, to the draft amendments to the Guidelines, subject to further consideration at MSC 85. The Committee recognized the need to establish a set of criteria and established a correspondence group, under the coordination of South Africa<sup>\*</sup>, with the following terms of reference:

.1 review the draft amendments on capacity-building to the Committees' Guidelines in document MSC 84/14, annex;

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- .2 develop criteria for the identification of capacity-building implications, and proposing new, or amendments to existing, instruments, taking into account the following matters:
  - .1 the scope that the proposed instrument intends to cover;
  - .2 whether the instrument has or will identify role players within clearly identified functions in the implementation;
  - .3 steps that are required to be taken into account to bring the instrument into force;
  - .4 the nature of the proposed instrument, whether it is mandatory or recommendatory;
  - .5 what minimum resources are and/or would be required during the implementation phase;
  - .6 whether the instrument is an enhancement or a deviation from an existing instrument/standard; and
  - .7 whether there is, or will be, a need to develop a guidance to implementation document;
- .3 consider the minimum information that proposers of new work programme items should submit as part of the original submission to the Committee or subsidiary body for consideration when the matter is evaluated;
- .4 develop a mechanism to identify new instruments requiring the provision of technical assistance prior to implementation and issues requiring special focus when developing technical cooperation and assistance activities relating to the implementation of new measures, and new instruments requiring a simplified guide to implementation; and
- .5 submit a report to MSC 85.

14.8 Delegations of Belgium, Cyprus, Denmark, Germany, the Netherlands, Norway, Sweden, the United Kingdom and the United States expressed their reservations on the Committee's decision to agree, in principle, to the draft amendments to the Committees' Guidelines (MSC 84/14, annex 2). In particular, the delegation of Cyprus stated that the draft amendments were not in line with the recommendations of the Assembly outlined in resolution A.998(25).

## **15 ROLE OF THE HUMAN ELEMENT**

### OUTCOME OF MSC 83

15.1 The Committee recalled that MSC 83 had agreed:

.1 that the FSI Sub-Committee should no longer be tasked with the revision of the Revised Guidelines on the implementation of the International Safety Management (ISM) Code by Administrations (resolution A.913(22)) and that this

work should be carried out by the Joint MSC/MEPC Working Group on Human Element and invited Member States and international organizations to submit proposals for consideration by the Joint MSC/MEPC Working Group on Human Element at MSC 84;

- .2 that documents submitted to the FSI Sub-Committee on this issue should be made available to the Joint MSC/MEPC Working Group on Human Element; and
- .3 to instruct the Joint MSC/MEPC Working Group on Human Element to develop draft amendments to the ISM Code with the understanding that the intended scope of the amendments should be limited to those relating to requirements for seafarer safety representation,

and, accordingly, MSC 83 had invited MEPC 57 to reconsider its decision on this issue.

15.2 In this context, the observer from IACS informed the Committee that the proposals in documents FSI 11/7/2 and FSI 12/7/1 submitted to the FSI Sub-Committee were no longer relevant and, hence, should be considered as withdrawn.

15.3 Furthermore, the Committee noted that MEPC 57 had agreed with the decision of MSC 83 and referred documents FSI 13/10/1 (IACS), FSI 12/4/3 (United Kingdom) and FSI 12/7/4 (Republic of Korea) to the Joint MSC/MEPC Working Group on Human Element for detailed consideration.

## MATTERS RELATED TO THE ISM CODE

## Amendments to the ISM Code

15.4 New Zealand and ITF (MSC 84/15/1) proposed to amend the ISM Code to enable full involvement of seafarers in health and safety initiatives.

15.5 A number of delegations supported the proposal to amend the ISM Code to enable full involvement of seafarers in health and safety initiatives. Some delegations, supporting in principle the proposed amendments to the ISM Code, expressed concern regarding the selection or appointment of the seafarer safety representative and their specific roles on board. However, a number of delegations sought clarification relating to:

- .1 selection/appointment process for the seafarer safety representative;
- .2 training for the seafarer safety representative;
- .3 dismissal protection for the seafarer safety representative, as this was a potential source of conflict; and
- .4 the authority of the master in relation to role and responsibility of the seafarer safety representative.

15.6 Some delegations expressed the opinion that procedures for seafarer safety representative should be in accordance with the ISM Code and the appointment of the seafarer safety representative should be left to the Company.

15.7 The observer from ITF clarified that it was not the intention to bypass the authority of the master or to provide a blanket protection to the seafarer safety representative other than for carrying out the functions entrusted by the role.

15.8 A number of delegations reiterated that the authority of the master was enshrined in the SOLAS Convention and the ISM Code, which in itself was a holistic way of looking at safety on board.

15.9 A number of delegations informed the Committee that ships flying their flag had seafarer safety representatives on board for many years without any problems related thereto.

15.10 Taking into account the above views and comments, the Committee referred the proposal to the Joint MSC/MEPC Working Group on Human Element for detailed consideration.

15.11 China and the Republic of Korea (MSC 84/15/3) proposed amendments to the ISM Code to harmonize the requirement for the extension of the validity of the Safety Management Certificate (SMC) with those of SOLAS certificates and the International Ship Security Certificate (ISSC). There was general support for this proposal.

15.12 The delegation of Panama, supported by others, expressed the view that it was not possible to verify all certificates at different ports as some flag States might not have sufficient inspectors and, therefore, supported the proposal to harmonize the requirement for the extension of the validity of Safety Management Certificate (SMC) with those of SOLAS certificates and International Ship Security Certificate (ISSC) which would allow a flag State to have better control over ships flying their flag.

15.13 In light of the foregoing, the Committee agreed to expand the scope of amendments to the ISM Code to include this proposal and referred it to the Joint MSC/MEPC Working Group on Human Element for detailed consideration.

# Amendments to the Revised Guidelines on Implementation of the ISM Code by Administrations (resolution A.913(22))

15.14 Austria *et al* (MSC 84/15/5) proposed amendments to the Revised Guidelines on Implementation of the ISM Code by Administrations (resolution A.913(22)) to improve the effectiveness of implementation of the International Safety Management (ISM) Code.

15.15 A number of delegations expressed the view that:

- .1 as the interim Document of Compliance (DOC) facilitated initial implementation of the ISM Code by a company, this should not delay the plans for setting up of a safety management system meeting the full requirements of the ISM Code;
- .2 the proposed additional requirements could cause difficulties not only for a new company to obtain an interim DOC but also for a company with an existing DOC, if it were to purchase/operate a new ship type;
- .3 the proposal could lead to the reduction in flexibility and also to the suppression of deficiencies; and
- .4 decision on an additional audit following a PSC detention should be left to the discretion of the Administration.

15.16 The Committee, after a general discussion, referred the proposal to the Joint MSC/MEPC Working Group on Human Element for detailed consideration.

## SAFETY RECOMMENDATIONS FOR DECKED FISHING VESSELS OF LESS THAN 12 METRES IN LENGTH AND UNDECKED FISHING VESSELS

15.17 The Committee recalled that MSC 83 had:

- .1 noted that SLF 50 had referred relevant chapters of the draft Safety recommendations for decked fishing vessels of less than 12 metres in length and undecked fishing vessels to the respective sub-committees and to the Joint MSC/MEPC Working Group on Human Element for consideration; and
- .2 also requested the Secretariat to prepare a relevant document for MSC 84, so that the Joint MSC/MEPC Working Group on Human Element, when established, could consider the relevant chapters of the draft Safety recommendations and comment as appropriate.

Accordingly, the Secretariat had prepared document MSC 84/15/2 containing the text of the preamble, chapters 1 and 11 of, and Annex I to, the draft Safety recommendations (SLF 51/5).

15.18 A number of delegations welcomed the draft Safety recommendations for small fishing vessels less than 12 metres in length, for their usefulness and supported to further develop the Safety recommendations. However, concerns were raised on requirements for crew accommodation of the draft Safety recommendations (MSC 84/15/2), as to whether it was necessary for such detailed requirements for small fishing vessels less than 12 metres in length, and, therefore, careful consideration was requested. Recognizing the need to carefully examine the draft Safety recommendations from the point of view of human element, the Committee referred it to the Joint MSC/MEPC Working Group on Human Element for further consideration, in order to provide comments and views from the human element perspective to SLF 51 for further consideration.

### THE ORGANIZATION'S STRATEGY TO ADDRESS THE HUMAN ELEMENT

### Near-miss data in accident and incident investigations

15.19 Liberia (MSC 84/15/4), taking into account comments made at MEPC 56, proposed guidance to address near-miss reporting and information based on the lack thereof in the industry.

15.20 The delegation of Greece drew the attention of the Committee to the fact that the Organization had already issued MSC.1/Circ.1015 on Reporting near-misses and that as most of the near-misses were hidden, other ways of reporting on near-misses had to be explored without the fear of any punitive action.

15.21 The delegation of the United States expressed the view that after the Joint MSC/MEPC Working Group had prepared the guidance it should be forwarded to the FSI Sub-Committee Casualty Investigation Working Group for their views.

15.22 The delegation of Turkey expressed the view that as there was no global database on near-miss data, a global database with anonymity was necessary.

15.23 Having briefly considered the proposal, the Committee referred it to the Joint MSC/MEPC Working Group on Human Element for consideration.

### **OTHER ISSUES**

### Ongoing work of the Human Factors Task Group (HFTG) established by the industry

15.24 The Committee was informed that STW 39 had considered the proposal by ICS *et al* (STW 39/6/1) on a model for the delivery of a training and competency verification programme, incorporating the five key elements within an effective safety culture being developed for all personnel who work on, or have direct involvement with, the cargo operations of oil tankers, chemical tankers and liquefied gas tankers and noted that the Human Factors Task Group had concluded that one of the most significant contributory factors to the incident causes was a failure to follow or understand cargo operation guidelines and procedures at both shipboard and ship management level. Accordingly, STW 39 had invited the Committee to refer document STW 39/6/1 to the Joint MSC/MEPC Working Group on Human Element for detailed consideration and advice on the way forward.

15.25 As requested by STW 39, the Committee referred document STW 39/6/1 (ICS *et al*) to the Joint MSC/MEPC working group on Human Element for detailed consideration and advice on the way forward.

### Paris MoU Concentrated Inspection Campaign on the ISM Code

15.26 The Committee noted the information provided by the Paris MoU (MSC 84/INF.10) on the preliminary findings on their Concentrated Inspection Campaign on the International Safety Management (ISM) Code carried out between 1 September and 30 November 2007.

### ESTABLISHMENT OF THE JOINT MSC/MEPC WORKING GROUP

15.27 The Committee established the Joint MSC/MEPC Working Group on Human Element and instructed it, taking into account the comments and decisions made in plenary, to:

- .1 consider document:
  - .1 MSC 84/15 together with documents FSI 12/4/3 and FSI 13/10/1, MSC 84/15/1 and MSC 84/15/3 and prepare draft amendments to the ISM Code;
  - .2 MSC 84/15/5 together with document FSI 12/7/4 and prepare draft amendments to Revised Guidelines on implementation of the ISM Code (resolution A.913(22));
  - .3 MSC 84/15/2 and advise the Committee on the relevant safety recommendations for decked fishing vessels of less than 12 metres in length, accordingly;
  - .4 MSC 84/15/4 and prepare a draft MSC/MEPC.7 circular on Guidance to address near-miss reporting and information based on the lack of near-miss reporting in the industry; and
  - .5 STW 39/6/1 and advise the Committee on the way forward; and

.2 review and update the action plan in the Organization's Strategy to address the human element.

### **REPORT OF THE WORKING GROUP**

15.28 Upon receipt of the report of the working group (MSC 84/WP.6), the Committee approved it in general and took action as outlined in the following paragraphs.

#### MATTERS RELATED TO THE ISM CODE

### Amendments to the ISM Code

15.29 The Committee, considering the proposal by New Zealand and ITF (MSC 84/15/1), agreed that promoting safe behaviour for a safety culture on board ships required the involvement of all personnel ashore and on board, in a cooperative environment without fear of any repercussions or intimidation. Several delegations expressed the view that, although there might be a need for seafarer safety representative, they had concerns with the proposal in its present format relating to:

- .1 small ships with small crews;
- .2 ships with multi-ethnic crews;
- .3 training;
- .4 relationship with the role of shipboard safety officer; and
- .5 relationship with the master.

The Committee, noting these concerns agreed that the proposal should be reconsidered at the next session of the Joint MSC/MEPC Working Group on Human Element.

15.30 The Committee agreed to the proposed amendments to the ISM Code by China and the Republic of Korea (MSC 84/15/3) to harmonize the requirement for the extension of the validity of Safety Management Certificate (SMC) with those of SOLAS certificates and International Ship Security Certificate (ISSC).

15.31 Having also agreed to the draft amendments to the ISM Code proposed by IACS (FSI 13/10/1), the Committee, accordingly, approved draft amendments to the ISM Code, set out in annex 20, and requested the Secretary-General to circulate the proposed amendments, in accordance with SOLAS article VIII, for consideration, at MSC 85, with a view to adoption.

## Amendments to the Revised Guidelines on implementation of the ISM Code by Administrations (resolution A.913(22))

15.32 The Committee considered the proposals in document MSC 84/15/5 (Austria *et al*) and expressed the view that the proposed amendments did not provide specific criteria to determine compliance with the requirements, but only provided a list of factors to be taken into account for consideration when seeking additional objective evidence to acquire an Interim Document of Compliance certificate and that criteria to assess the above-mentioned factors should be included in proposed paragraph 2.1.5 in order to provide better guidance. The Committee, however, did not agree to the proposed new paragraph 3.16.1.

15.33 The Committee noted the information in document FSI 12/4/3 (United Kingdom) related to the application of the ISM Code.

15.34 The Committee considered the proposal in document FSI 12/7/4 (Republic of Korea) and was of the view that:

- .1 specific intervals for the verification process was already reflected in the existing guidance and there was no need for duplication; and
- .2 with respect to the proposed amendments relating to standards on the transfer of ISM Code certification, the guidelines for Administrations and for recognized organizations (ROs) should be clearly delineated since requirements for transfer of flag and transfer of RO do not follow the same set of standards as proposed.

15.35 The Committee, noting that the amendments to these guidelines would only be adopted at the twenty-sixth session of the Assembly in November/December 2009, agreed that it would be more appropriate to prepare preliminary text at this session with a view to finalizing it at the next session of the Joint MSC/MEPC Human Element Working Group to be convened at MEPC 59.

15.36 Accordingly, the Committee noted a preliminary draft text of amendments to the Revised Guidelines on implementation of the International Safety Management (ISM) Code by Administrations and invited Member Governments and international organizations to submit comments and proposals for consideration at the next session of the Joint MSC/MEPC Working Group on Human Element for finalization with a view to adoption at A 26.

## SAFETY RECOMMENDATIONS FOR DECKED FISHING VESSELS OF LESS THAN 12 METRES IN LENGTH AND UNDECKED FISHING VESSELS

15.37 The Committee considered document MSC 84/15/2 (Secretariat), containing the text of the preamble, chapters 1 and 11 of, and annex 1 to, the draft Safety recommendations (SLF 51/5), and agreed that chapter 11 of the proposed Safety recommendations provided information on the design, construction, equipment, training and protection of the crew of small fishing vessels that were at sea for more than 36 hours, took into account the human element and were therefore useful in promoting the safety of the vessel and safety and health of the crew.

15.38 In this context, the Committee endorsed the proposed amendments to chapter 1 (General provisions) of the draft Safety recommendations for decked fishing vessels of less than 12 metres in length and undecked fishing vessels, as provided below:

- .1 in subparagraph 1.1.3, the word "similar" should be inserted between the words "any" and "body" and at the end of the sentence, the words "that is accessible from the sea" should be inserted after the word "water"; and
- .2 in subparagraph 1.1.4, the words "non-commercial" should be inserted between the words "to" and "vessels" and the words "used for sport or recreation" should be deleted,

and requested the Secretariat to forward the above comments to SLF 51.

## THE ORGANIZATION'S STRATEGY TO ADDRESS THE HUMAN ELEMENT

## Near-miss data in accident and incident investigations

15.39 The Committee, following consideration of document MSC 84/15/4 (Liberia) and relevant recommendations of the group (MSC 84/WP.6), agreed that there was a need to provide guidance to encourage companies and seafarers to document and record information on near-misses and hazardous situations in order to understand the precursors to events that were detrimental to safety and the marine environment, and approved draft MSC-MEPC.7 circular on Guidance on near-miss reporting, set out in annex 3 to document MSC 84/WP.6, subject to concurrent decision by MEPC 58.

## **OTHER ISSUES**

## Ongoing work of the Human Factors Task Group (HFTG) established by the industry

15.40 The Committee considered document STW 39/6/1 (ICS *et al*) and noted that the STCW Convention related to training and certification of seafarers on board ships whereas the proposal by ICS *et al* also encompassed personnel working ashore in companies, port facilities and terminals. The Committee discussed concerns regarding the proposed tanker endorsement on matters relating to requirements for sea service, additional training and unnecessarily specific endorsements, revalidation and familiarization training that overburdened seafarers.

15.41 The Chairman of the STW Sub-Committee expressed concerns relating to the establishment, timing and the terms of reference of the correspondence group proposed by the working group and indicated that, as the proposed terms of reference for the correspondence group covered issues relating to seafarers serving on board tankers, this would have a bearing on the ongoing comprehensive review of the STCW Convention and the STCW Code.

15.42 Several delegations, supporting the concerns expressed by the Chairman of the STW Sub-Committee, expressed the opinion that any matters relating to training and certification of seafarers should only be discussed by the STW Sub-Committee. Furthermore, they also expressed the opinion that the criteria for revalidation and competency verification in the proposal were neither feasible nor sustainable. Accordingly, they did not support the establishment of the correspondence group with the proposed terms of reference.

15.43 One delegation made also reservations regarding the proposed correspondence group and its terms of reference on additional training for shore-based personnel. In their opinion, provisions in sections 5.2 and 6.5 of the ISM Code were sufficient to address training of shore-based personnel.

15.44 Several delegations, supporting the establishment of the correspondence group with the proposed terms of reference, recalled that the Inter-industry Human Factors Task Group had been established at the request of the Committee to study the reported incidents of explosions on chemical and product tankers under 20,000 dwt. In their opinion, the report had, perhaps, not been adequately presented.

15.45 However, the majority could not accept that consideration of seafarers training and certification issues by the proposed correspondence group, as this could potentially impede progress of the ongoing comprehensive review of the STCW Convention and the STCW Code. They further stated that the work of the correspondence group should only supplement and provide feed back to the ongoing work of the STW Sub-Committee. I:\MSC\84\24.doc

15.46 Following the debate, the Committee concluded that:

- .1 the issues were very important and required careful consideration;
- .2 the issues involved both shipboard and shore personnel;
- .3 the ongoing comprehensive review of the STCW Convention and the STCW Code was under time constraints and any delay should be avoided;
- .4 input from the industry was appreciated; and
- .5 the outcome of discussions in the correspondence group should be reported to the *ad hoc* STW intersessional working group.
- 15.47 The Committee agreed that:
  - .1 the *ad hoc* STW intersessional working group should allocate sufficient time to address familiarization training for shipboard personnel and review tanker specific training requirements for personnel with operational and management level responsibilities;
  - .2 the correspondence group should take into account the outcome of the *ad hoc* STW intersessional working group;
  - .3 the correspondence group should initially focus its work on shipboard personnel and provide the relevant input to the *ad hoc* STW intersessional working group and thereafter on shore-based personnel; and
  - .4 the correspondence group should submit its report for consideration by the Joint MSC/MEPC Working Group on Human Element scheduled to meet during MEPC 59.

15.48 Taking into account the views expressed above, the Committee established a correspondence group under the coordination of ICS<sup>\*</sup>, with the following terms of reference:

Recognizing that STW 39/6/1 reflects work of the industry Human Factors Task Group (HFTG) on revised requirements for tankers endorsements, the correspondence group, taking into account the human element, as relevant, and the information contained in document STW 39/6/1, to:

Coordinator:

Mr. John Murray, Marine Adviser International Chamber of Shipping 12 Carthusian Street London ECM 6EZ, Tel: +44 20 7417 8844, +44 20 7417 2898 (direct), Mobile: +44 78 5538 5041 Fax: +44 20 7417 8877 E-mail: john.murray@marisec.org www.marisec.org

- .1 develop proposals for familiarization training for shipboard personnel;
- .2 develop proposals for familiarization training for operational shore-based personnel;
- .3 review tanker specific training requirements for personnel with operational and management level responsibilities on board tankers and shore-based staff with ship management responsibilities; and
- .4 submit a report to MEPC 59 for consideration by the Joint MSC/MEPC Working Group on Human Element.

## Updated human element action plan

15.49 The Committee approved the updated Human element action plan provided in the annex to MSC-MEPC.7/Circ.4 on the Organization's strategy to address the human element, subject to concurrent decision by MEPC 58.

## 16 FORMAL SAFETY ASSESSMENT

## General

16.1 The Committee recalled that MSC 83, recognizing that there would be an outcome of MEPC 57 regarding environmental risk acceptance criteria and other submissions to this session, in particular related to the review of FSA studies, had agreed to retain the item in the provisional agenda for this session.

## **Review of FSA studies**

16.2 Recalling also that MSC 83 noted the possibility of holding an FSA Experts Group at MSC 86 as a working group to review of FSA studies submitted by Denmark (MSC 83/21/1, MSC 83/21/2, MSC 83/INF.3 and MSC 83/INF.8), the Committee considered document MSC 84/16, containing the outcome of MSC 83 on matters related to review of FSA studies and relevant parts of the Guidance on the use of HEAP and FSA (MSC-MEPC.2/Circ.6), and, having noted the procedures for the establishment of an FSA Experts Group prescribed in the aforementioned Guidance on the use of HEAP and FSA, agreed, in principle, to hold an FSA Experts Group for review of FSA studies at MSC 86. In this context, the Committee noted the information provided by the delegation of Denmark that they intend to submit, to MSC 85, the FSA studies on cruise ships and ro-pax ships, and an FSA study on oil tankers to MSC 86.

### Outcome of MEPC 57

16.3 The Committee noted that MEPC 57, having considered the report of the FSA Correspondence Group (MEPC 57/17), noted that, while progress had been made, divergent views had remained, and had re-established the correspondence group to further review the environmental risk acceptance criteria. The Committee also noted that MEPC 57, in the light of the work to be carried out, had agreed to request the Committee to retain the item in the provisional agenda for MSC 85.

## Retention of the item in the agenda

16.4 The Committee, recognizing that, at MSC 85, there would be an outcome of MEPC 58 regarding environmental risk acceptance criteria and submissions related to the review of FSA studies, agreed to retain the item in the provisional agenda for MSC 85, and encouraged Member Governments and international organizations to submit, to MSC 85, proposals and comments on matters related to the review of the FSA studies and arrangements for the FSA Experts Group.

## 17 PIRACY AND ARMED ROBBERY AGAINST SHIPS

## Comprehensive review of guidance for preventing and suppressing piracy and armed robbery against ships

17.1 The Committee noted (MSC 84/17/1, Secretariat) that the Assembly, at its twenty-fifth session, had requested the Committee to undertake a comprehensive review of the guidance provided by the Organization for preventing and suppressing piracy and armed robbery against ships. This review should, *inter alia*:

- .1 take into account the current trends and practices of the perpetrators;
- .2 provide advice in cases where seafarers, fishermen and other mariners are kidnapped or held hostages for ransom; and
- .3 provide advice in cases where naval vessels and military aircraft seek to provide assistance or protection.

17.2 In this context, the Committee gave initial consideration to the proposals of Denmark (MSC 84/17/4) which offered a number of suggested enhancements to the guidance given in MSC/Circ.622/Rev.1 and MSC/Circ.623/Rev.3, in the light of the increased number of hijackings over the last year; the nature of the attacks; and the entry into force of the ISPS and ISM Codes.

17.3 During the discussions of the proposals of Denmark, the delegation of Yemen drew attention to the draft memorandum of understanding developed by the meeting held in Dar es Salaam, United Republic of Tanzania, which proposed, *inter alia*, the establishment of regional information centres in Yemen and Kenya. The delegation of Yemen thanked the Organization for its efforts to establish a regional maritime information centre for the Red Sea and Gulf of Aden through the meetings held in Sana'a in 2005 and Muscat in 2006; advised the Committee that work had already commenced to build such a centre in Sana'a; and called upon States in the region to sign, without delay, the regional agreements developed by the Sana'a/Muscat process and the Dar es Salaam meeting. The Committee noted the offer of Yemen to host a meeting to sign a regional agreement.

17.4 The delegation of Nigeria gave a verbal report on the outcome of the International Conference on Piracy and Armed Robbery at Sea held in Abuja, Nigeria from 28 to 30 April 2008, reiterating the remarks of the Secretary-General that "maritime security and the suppression of piracy and armed robbery against ships must therefore be a coordinated effort, both nationally and regionally. The "three Cs" of security: communication, cooperation and coordination are vital and we encourage Nigeria to lead the way in developing seamless inter-agency cooperation between police, military, intelligence, judiciary, industry and community stakeholders. Only by an open, honest and integrated approach to the enforcement of I:\MSC\84\24.doc

the rule of law from inland waterways to the outer extremities of the exclusive economic zone, will we have a chance of delivering the security that we all need". The delegation of Nigeria reported that the Conference had reached consensus on a pragmatic course of action and that results would be forthcoming, even if they were not immediately apparent.

17.5 Following discussions in which the proposals of Denmark were widely supported, the Committee decided that the best way to take the issue forward would be to establish a correspondence group to progress the matter intersessionally for further consideration at MSC 85.

17.6 The Committee noted that ITF (MSC 84/17/2) had questioned the effectiveness of the guidance for preventing and suppressing piracy and armed robbery against ships where, in their view, the vessels are inadequately manned and crews have been given insufficient training, information or technology to deal with these situations; and had called on flag States to actively take up the issue with Companies and take punitive action against those paying only lip service to effective manning levels.

## Establishment of a drafting group

17.7 Following discussion in plenary, the Committee established an *ad hoc* drafting group to develop terms of reference for a correspondence group on the review and updating of MSC/Circ.622/Rev.1, MSC/Circ.623/Rev.3 and resolution A.922(22).

## Piracy and armed robbery against ships in waters off the coast of Somalia

17.8 The Committee noted that the Assembly, at its twenty-fifth session, had adopted resolution A.1002(25) on Piracy and armed robbery against ships in waters off the coast of Somalia, and noted that operative paragraph 7 of resolution A.1002(25) had called upon Governments in the region to conclude, in cooperation with the Organization, and implement, as soon as possible, a regional agreement to prevent, deter and suppress piracy and armed robbery against ships. Pursuant to operative paragraph 7, plans were being made to convene, subject to the decision of the Council of IMO, an IMO-sponsored meeting for the conclusion and signing of such a regional agreement during the fourth quarter of 2008. To this end, a two-stage, sub-regional meeting on piracy and armed robbery against ships in the Western Indian Ocean had been held in Dar es Salaam, United Republic of Tanzania from 14 to 18 April 2008.

17.9 Following an oral briefing given by the Director, Maritime Safety Division, the Committee noted that the purpose of the sub-regional meeting had been to enhance the level of awareness of Governments in the region on issues relating to piracy and armed robbery against ships; to start a process of building their capacity to deal with related matters; and to prepare a draft regional agreement to be submitted for consideration with a view of adoption at a meeting to be convened, subject to the endorsement of the Council, later on this year, should the progress made during the sub-regional meeting justify so doing.

Over sixty participants from the following 13 States from the region attended the sub-regional meeting: Comoros, Egypt, Ethiopia, France, Kenya, Madagascar, Maldives, Mauritius, Seychelles, South Africa, Sudan, the United Republic of Tanzania and Yemen. The sub-regional meeting was hosted by the Government of the United Republic of Tanzania, supported by IMO and funded by the Organization's Technical Co-operation Fund. The United Nations Division for Ocean Affairs and the Law of the Sea, the United Nations Office on Drugs and Crime, the United Nations Political Office for Somalia, the World Food Programme, INTERPOL,

ReCAAP-ISC, BIMCO, Denmark, Kenya, the Republic of Korea, the United Kingdom, the United Republic of Tanzania, the United States of America and Yemen had also supported the meeting through their active participation as speakers.

During the meeting, these subject-matter experts gave presentations on a range of piracy related topics including:

- the situation in Somalia;
- the international legal framework;
- requirements for national legislation;
- civil military cooperation; and
- models for regional cooperation and capacity-building.

The meeting had been judged by the participants to be very successful, having progressed the issues of cooperation at both national and regional levels. The participants developed and agreed a draft Memorandum of Understanding concerning the repression of piracy and armed robbery against ships in the Western Indian Ocean, the Gulf of Aden and the Red Sea, subject to further editorial and legal review and translation by IMO, for onward transmission to national authorities and the Council of IMO for its consideration.

The ultimate success or otherwise of this meeting would be evaluated in the context of the follow-up action taken by participating Governments to improve cooperation, coordination and communication nationally and throughout the Western Indian Ocean, Gulf of Aden and Red Sea, including the implementation of the Memorandum of Understanding concerning the repression of piracy and armed robbery against ships in the Western Indian Ocean, the Gulf of Aden and the Red Sea.

17.10 In acknowledging the words of appreciation of a number of delegations for the efforts of the Secretariat to address the problem of piracy and armed robbery in waters off the coast of Somalia, the Secretary-General noted with satisfaction that, in the 24 years since the Organization had become actively involved in countering piracy and armed robbery against ships, the number of such incidents had been reduced significantly in South America, the South China Sea and the Straits of Malacca and Singapore, largely through the cooperative efforts of the States concerned and through regional initiatives, such as the Regional Co-operation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP). The areas for concern were now in the Gulf of Guinea and in the waters off the coast of Somalia.

The Secretary-General paid tribute to the Council for its efforts to stir action by the United Nations Security Council (UNSC) by seeking consent, from the part of Somalia's Transitional Federal Government, for intervention, in the country's territorial sea, by naval vessels of third countries operating in Western Indian Ocean and Gulf of Aden waters. In 2005, the Council's action had resulted in a 'Presidential Statement' by the President of the United Nations Security Council, which had had a favourable impact on reducing piratical activities in the waters concerned. Currently, the adoption of a draft UNSC resolution was being considered, which would hopefully have good results in stemming the activities of pirates and armed robbers. The Secretary-General requested Members of the UNSC to support the adoption of the draft resolution; and all other members to promote, through the United Nations General Assembly, action to prevent piracy off the coast of Somalia.

# Regional Co-operation Agreement on Combating Piracy and Armed Robbery against Ships in Asia

17.11 Recalling that the ReCAAP Information Sharing Centre had been launched on 29 November 2006, the Committee noted that the Council at its twenty-fourth extraordinary session, had considered and the Assembly, at its twenty-fifth regular session, had approved the proposed Agreement of Co-operation between IMO and the Regional Co-operation Agreement on Combating Piracy and Armed Robbery against ships in Asia, the Committee noted ReCAAP's commitment to assisting in countering piracy and armed robbery against ships globally.

## Reporting and investigation of acts of piracy and armed robbery against ships

17.12 The Committee noted the proposals of ICC-IMB (MSC 84/17/3) to provide for an effective response against piracy and armed robbery against ships, through, *inter alia*, ICC-IMB being tasked with providing to the international maritime community, assistance with the implemention of the Code of Practice for the investigation of the crimes of piracy and armed robbery against ships; and with responsibility for receiving and promulgating reports of such acts.

17.13 The Committee also noted that both INTERTANKO (MSC 84/17/5) and BIMCO (MSC 84/17/6) supported the proposal by the ICC-IMB.

17.14 While thanking ICC-IMB and the IMB Piracy Reporting Centre in Kuala Lumpur for their valuable work, the majority of delegates who spoke expressed the view that jurisdiction over acts of piracy (on the high seas) and armed robbery against ships (within national jurisdiction) were State responsibilities and thus to encourage States to favour one commercial, albeit non-profit-making, entity would be inappropriate and inconsistent with international law.

17.15 Noting that there was support among many delegations and observers for many of the other proposals of ICC, the Committee instructed the drafting group to take document MSC 84/17/3 into account when developing terms of reference for the correspondence group, however, the correspondence group should not engage in discussion on elements which may undermine existing efforts including issues concerned with sovereign rights, jurisdiction and responsibilities of States under international law.

## Statistical information

17.16 The Committee recalled that, since MSC 77, the usual monthly and quarterly reports on piracy and armed robbery against ships have been circulated under the MSC.4/Circ. series. The annual report for the calendar year 2007 had been issued under the symbol MSC.4/Circ.115.

17.17 The Committee recalled that, since June 2001 and in accordance with the instruction of MSC 74, the MSC.4 circulars reporting on acts of piracy and armed robbery differentiated (in separate annexes) acts of piracy and armed robbery actually "committed" from "attempted" ones.

17.18 In considering document MSC 84/17 (Secretariat), the Committee noted that the number of acts of piracy and armed robbery against ships reported to the Organization and which had occurred in 2007 was 282 against 241 during the previous year, representing an increase of 17% from the figure for 2006.

17.19 The Committee observed that this 17 % increase in the reported acts of piracy and armed robbery against ships during the period under review was a cause for concern and was largely attributable to an increase in such criminal activities in the region of North East Africa, the Arabian Sea and off the coast of West Africa. The total number of incidents of piracy and armed robbery against ships, reported to have occurred or to have been attempted from 1984 to the end of March 2008, was 4,569. As emphasized in previous sessions of the Committee, much more still needed to be done to reduce this menace.

17.20 The Committee further observed that during the period under review (i.e., 1 January to 31 December 2007), it had emerged that the areas most affected (i.e. five incidents reported or more) were the Far East, in particular the South China Sea and the Malacca Strait, East Africa, West Africa, Indian Ocean, South America and the Arabian Sea and that most of the attacks worldwide have occurred or been attempted in territorial waters while the ships were at anchor or berthed.

17.21 The Committee expressed deep concern that in many of the reports received, the crews had been violently attacked by groups of five to ten people carrying knives or guns. From the same information, it emerged that, during the period under review, twenty crew members had been killed, one hundred and fifty-three crew members were reportedly injured/assaulted. About one hundred and ninety crew members were reportedly taken hostage/kidnapped and two crew members were reportedly still unaccounted for. Sixteen ships had been hijacked.

17.22 The Committee concluded by urging, once again, all Governments and the industry to intensify and coordinate their efforts to eradicate these unlawful acts.

17.23 The Committee noted that despite numerous requests, at previous sessions of the Committee, the Secretariat still received very few, if any, reports from Member Governments on action they had taken with regard to incidents reported to have occurred in their territorial waters. The Committee reiterated the urgent need for all Governments to provide the Organization with the information requested.

## **Report of the drafting group**

17.24 Having received the report of the drafting group (MSC 84/WP.11), the Committee agreed to establish a correspondence group on the review and updating of MSC/Circ.622/Rev.1, MSC/Circ.623/Rev.3 and resolution A.922(22), under the coordination of Denmark<sup>\*</sup>, with the following terms of reference:

.1 when proposing amendments to MSC/Circ.622/Rev.1, MSC/Circ.623/Rev.3 and resolution A.922(22), the correspondence group should:

\* Coordinator:

Ms Birgit Sølling Olsen Director for Shipping Policy Danish Maritime Authority Vermundsgade 38C DK-2100 København Ø Denmark Tel: +45 39 17 45 08 Fax: +4539 17 44 13 E-mail: bso@dma.dk

- .1 take into account the current trends and practices of the perpetrators, and regional responses thereto;
- .2 take into account the special measures to enhance maritime security contained in SOLAS chapter XI-2 and the ISPS Code, which have been adopted by the Organization since the adoption or revision of MSC/Circ.622/Rev.1, MSC/Circ.623/Rev.3 and resolution A.922(22);
- .3 consider the proposals of Denmark (MSC 84/17/4, annex), ITF (MSC 84/17/2), and ICC (MSC 84/17/3) specifically related to the revision of MSC/Circ.622/Rev.1, MSC/Circ.623/Rev.3 and resolution A.922(22); and
- .4 consider the need for guidance to seafarers, fishermen and other mariners in case they are attacked, fired upon, kidnapped or held hostage by pirates and armed robbers;
- .2 the correspondence group should give an interim report to MSC 85 and submit its final report for consideration by MSC 86; and
- .3 the correspondence group should engage in discussion on issues that complement existing efforts but not elements which may undermine such efforts including issues concerned with sovereign rights, jurisdiction and responsibilities of States under international law.

# 18 TECHNICAL ASSISTANCE SUB-PROGRAMME IN MARITIME SAFETY AND SECURITY

## **DEVELOPMENTS CONCERNING TECHNICAL COOPERATION ACTIVITIES**

## General

18.1 The Committee noted the information provided in document MSC 84/18 on the safety- security- and facilitation-related activities executed in 2007 and those planned for 2008 under the Integrated Technical Co-operation Programme (ITCP) for the biennium 2008-2009 and was advised by the Secretariat of additional information on technical cooperation activities.

## **Domestic ferry safety**

18.2 The Committee recalled that, at its eighty-second session, it was informed that the continual loss of life resulting from domestic ferry accidents had prompted IMO to develop an eight-phase plan concerning non-Convention ferry safety and invited the International Ferry Industry Association (INTERFERRY) to join in this effort. The two Organizations had signed a Memorandum of Understanding (MoU) in January 2006, formalizing their intent to work together towards enhancing the safety of domestic non-Convention ferries by collaborating, through IMO's Integrated Technical Co-operation Programme (ITCP).

18.3 The Committee recalled also that, at its eighty-third session, it had noted that after the Working Group meeting in Bangladesh in December 2006, the two Organizations were working on phase 5 of the plan on resource mobilization of funds for the project and that the first pilot project was under preparation and on completion of the project document, it would be launched once the funding from donors had been committed.

18.4 The Committee noted the information provided in document MSC 84/18 (Secretariat) that following the work by the two Organizations on resource mobilization, a needs assessment mission funded by the United Kingdom was conducted to evaluate the status of implementation of existing national regulations within the industry and the maritime Administration. Recommended modifications to the current regulations were agreed and will be effected by the Government of Bangladesh accordingly. It also noted that the establishment of an electronic national database to monitor the safety standards of domestic fleets was currently progressing through funding provided by the Government of the Republic of Korea.

18.5 The Committee further noted that a needs assessment mission, funded by Videotel, was carried out in March 2008 to gather salient information and materials for the preparation of the training modules dealing with site specific aspects of ferry safety. It also noted that, under a fund provided by the United States National Oceanographic and Atmospheric Administration, their experts would visit Bangladesh between June and July 2008 and work with the meteorological department to develop a user-friendly alert system on hazardous weather for masters and operators.

18.6 The Committee commended the Member States and organizations that had assisted in this project and urged Governments and industry to contribute to the IMO's technical cooperation programmes and requested the Secretariat to continue providing the Committee with updated information.

## IMO MODEL COURSE PROGRAMME

18.7 The Committee noted the information in document MSC 84/18/1 (Secretariat) that 34 model courses had been translated into French and 38 model courses into Spanish. Of these translated model courses, 28 had been published in French and 30 in Spanish. The Committee requested the Secretariat to continue its follow-up and provide an updated report to MSC 85.

## 13th General Assembly of Ministers of MOWCA

18.8 The observer from the Maritime Organisation of West and Central Africa (MOWCA) informed the Committee that the MOWCA Member States continued their efforts to participate fully in the IMO initiatives to combat piracy and armed robbery against ships in the sub-region. He further informed the Committee that the 13th General Assembly of Ministers of MOWCA would be held in Dakar, Senegal from 29 to 31 July 2008, which would, among other issues, consider for adoption and signature, a Memorandum of Understanding (MOU) for the implementation of the MOWCA sub-regional Coast Guard Network and invited all members to participate.

### Sub-regional meeting on piracy and armed robbery against ships

18.9 The delegation of the United Republic of Tanzania expressed its appreciation to the Organization for the support and assistance provided through national activities conducted under the IMO Integrated Technical Co-operation Programme (ITCP), in particular, the recently held Sub-regional meeting on Piracy and armed robbery against ships in the Western Indian Ocean in Dar es Salaam, Tanzania, from 14 to 18 April 2008.

## **19** IMPLEMENTATION OF INSTRUMENTS AND RELATED MATTERS

## **Status of Conventions**

19.1 The Committee noted the information on the conventions, protocols and amendments thereto in respect of which IMO performs depositary functions and which are related to the work of the Committee, as at 29 February 2008 (MSC 84/19 and MSC 84/INF.13) and was advised orally by the Secretariat of additional information on instruments of ratification, acceptance, approval of, or accession to, safety-related IMO conventions and protocols deposited with the Secretary-General received on or after the date the above documents were prepared, i.e. the accessions by the Comoros to the 1988 SUA Convention and the 1988 SUA Protocol, and by Sierra Leone to the 1978 SOLAS Protocol and the 1995 STCW-F Convention; and the ratification by the Marshall Islands and Spain of the 2005 SUA Convention and the 2005 SUA Protocol.

## Codes, recommendations, guidelines and other non-mandatory instruments

19.2 The Committee recalled that MSC 83 had considered the comprehensive list prepared by the Secretariat (MSC 82/18/1 and MSC 82/INF.12) of codes, recommendations, guidelines and other safety- and security-related non-mandatory instruments, which had been adopted by resolutions or approved in the form of circulars.

19.3 The Committee also recalled that MSC 83 had referred the detailed consideration of the list annexed to document MSC 82/INF.12 to the relevant sub-committees for the identification of those instruments which might be relevant in the context of the collection of information on the implementation of non-mandatory instruments.

19.4 Having noted that, to date, only DE 51, STW 39 and COMSAR 12 had reported the outcome of their consideration of the relevant extracts of the list annexed to document MSC 82/INF.12, as prepared and updated by the Secretariat, the Committee agreed to consider the matter further at MSC 86 when the outcome of the consideration of this issue by all sub-committees will be available.

## **Building contract dates**

19.5 The Committee considered the proposal by IACS (MSC 84/19/1), which had also been submitted to MEPC 57, to develop guidance, in the form of a joint MSC-MEPC circular, on the building contract dates to be used for determining the application of relevant statutory regulations to the optional vessels, in the context of the construction of a series of vessels including specified optional vessels.

19.6 Having noted that MEPC 57 had endorsed the proposal by IACS and had invited the Committee to issue an MSC-MEPC circular with the proviso that the optional vessels should be built in the same yard and from the same plans as those of the initial series (MSC 84/2/3, paragraph 5.3), the Committee requested the Secretariat to prepare a draft MSC-MEPC circular, taking into account the outcome of MEPC 57, the clarifications provided by IACS when introducing document MSC 84/19/1 on the process followed by its members in the context of the new building contract containing an option for the construction of additional ships, and the comments made in plenary.

19.7 Having considered the text of the draft circular prepared by the Secretariat (MSC 84/WP.13), the Committee agreed to instruct FSI 16 to further consider the draft MSC-MEPC circular, together with the following suggested changes:

- .1 the text of the reference to the various dates should be kept as it appears in the regulations;
- .2 the word "yard" should be put in square brackets and followed by "[shipbuilder]"; and
- .3 the following paragraph should be added:

"The sets of amendments containing specifications regarding the contract date, the keel laying date or the delivery date should be applied as follows:

- .1 if a ship's contract date occurs on or after the contract date specified for a particular set of amendments, the set of amendments should apply;
- .2 the keel laying date criteria should only be considered in the absence of a contract; and, if a ship's keel laying date occurs on or after the keel laying date specified for a particular set of amendments, the set of amendments should apply; and
- .3 regardless of the ship's contract date or keel laying date, if a ship's delivery date occurs on or after the delivery date specified for a particular set of amendments, then that set of amendments should apply.

19.8 The FSI Sub-Committee was instructed to finalize the preparation of the draft MSC-MEPC.5 circular with a view to its approval by MEPC 58 and MSC 85.

### 20 RELATIONS WITH OTHER ORGANIZATIONS

#### **R**ELATIONS WITH NON-GOVERNMENTAL ORGANIZATIONS

### **Applications for consultative status**

20.1 The Committee noted (MSC 84/20) that the Council had decided to:

- .1 grant consultative status to:
  - .1 the International Painting and Printing Ink Council (IPPIC);
  - .2 the International Fund for Animal Welfare (IFAW), on a provisional basis, for no more than two years, after which a review should be conducted; and
  - .3 the International Spill Control Organization (ISCO), on a provisional basis, for no more than two years, after which a review should be conducted;

- .2 defer its decision with regard to the application for consultative status of the Global Maritime Education and Training Association (GlobalMET) to C 100, pending its consideration by the Technical Co-operation Committee at its fifty-eighth session in June 2008;
- .3 convert the provisional consultative status granted to the International Maritime Health Association (IMHA) to full consultative status;
- .4 retain the consultative status of the Iberoamerican Institute of Maritime Law (IIDM);
- .5 retain the consultative status of the International Bar Association (IBA); and
- .6 accept the request of the Latin American Shipowners' Association (LASA) to withdraw its consultative status and maintain its privileged access to IMO documents.

## UNITED NATIONS HIGH COMMISSIONER FOR REFUGEES (UNHCR)

20.2 The Committee, recalling its debate and decision taken on the proposal by Italy and Spain (MSC 84/22/5) under agenda item 22 (Work programme), noted the information provided by the Secretariat in document MSC 84/20/1 and requested it to keep the Committee updated on further United Nations inter-agency meetings on the treatment of persons rescued at sea.

### OUTCOME OF THE NINETEENTH MEETING OF THE PARTIES TO THE MONTREAL PROTOCOL

- 20.3 The Committee noted information provided by the Secretariat (MSC 84/20/2) on:
  - .1 the decision taken by the nineteenth meeting of the Parties to the Montreal Protocol on the need to take all necessary actions to reduce reliance on halons in the maritime sector, taking into account the decreasing availability of halons for marine and aviation uses; and
  - .2 the request made at FP 52 for IMO to assist in this effort by encouraging its Member States to collect data on the number of halon systems; number of ships so equipped; and total amount of halons installed on their merchant fleets, and to convey this information to the Ozone Secretariat for its use in completing the assignment it has received from the Parties to the Montreal Protocol.

20.4 The Committee further noted that MEPC 57 had agreed to a joint MSC-MEPC circular, set out in the annex to document MSC 84/2/3, requesting Members Governments to collect data on halons for the maritime sector and report this information directly to the Ozone Secretariat (MSC 84/2/3).

20.5 In this context, the Committee considered the comment by the Secretariat that the aforementioned joint circular requesting, in paragraph 4 of the cover note, shipowners, ship operators, shipping companies and all other interested entities to take appropriate action to reduce their reliance on halons, might be misunderstood to mean that halons could not be used to extinguish a fire on board a ship. Consequently, the Committee, in agreeing with the Secretariat, approved MSC-MEPC.1/Circ.3 on Decreasing availability of halons for marine use, having added a new paragraph 5 as follows:

"5 Notwithstanding the above request, operators of ships constructed before 1 October 1994, which may still have halon systems installed, should use such systems to extinguish a fire, if necessary, to ensure the continued safety of the ship. In addition, when an existing halon system is removed from a ship, the stored halons should be transferred to an approved halon."

20.6 The delegation of Malta expressed the opinion that notwithstanding the above circular, more information was needed in the industry relating to the use of halons.

## UNITED NATIONS OPEN-ENDED INFORMAL CONSULTATIVE PROCESS ON OCEANS AND LAW OF THE SEA FOCUSING ISSUES ON MARITIME SECURITY AND SAFETY

20.7 The Committee recalled that MSC 83 had noted the information provided by the Secretariat (MSC 83/23/2) that:

- .1 as requested by the Committee, the Secretariat had followed closely further developments at the UN level on the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (the Consultative Process) and reported thereon, as appropriate, to previous sessions of the Committee;
- .2 the UN General Assembly, in its resolution 61/222 of 20 December 2006, had decided that the ninth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea in 2008 would focus its discussion on the topic "Maritime security and safety"; and
- .3 the Secretariat had already been contacted by the UN Division for Ocean Affairs and the Law of the Sea (DOALOS) of the Office of Legal Affairs requesting submission of information relevant to the topic of focus for the ninth meeting of the Consultative Process, "Maritime security and safety", for inclusion in next year's report and, in particular to provide information by November 2007 on:
  - .1 activities currently undertaken related to maritime safety and security; and
  - .2 matters which may require further action and any suggested recommendations, with an emphasis on areas where coordination and cooperation at the intergovernmental and inter-agency levels could be enhanced,

and had invited Member Governments to liaise with their relevant UN representatives at the national level, asking them to get involved in the preparation for the Consultative Process. MSC 83 had also requested the Secretariat to keep it informed of the further developments.

20.8 In this context, the Committee noted the information provided by the Secretariat (MSC 84/INF.2) as IMO's contribution to the DOALOS office, for consideration by the Consultative Process.

20.9 The Committee also noted the updated comprehensive information relating to the schedule of activities for the forthcoming ninth meeting of the UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea to be held from 23 to 27 June 2008 at the UN Headquarters in New York and requested the Secretariat to keep the Committee informed of the further developments.

20.11 The delegation of the Netherlands appreciated the proactive approach of the Secretariat and expressed the opinion that every effort should be made to highlight the achievements of the Organization.

## 21 APPLICATION OF THE COMMITTEE'S GUIDELINES

## Amendments to the Committee's Guidelines

21.1 The Committee recalled that MSC 83, having considered the recommendations of the 2007 Chairmen's meeting (MSC 83/WP.10), had agreed:

- .1 that intersessional working groups and technical groups should not be held at the same time as Committee or sub-committee meetings;
- .2 that splinter groups of a working group, if established, should meet outside normal working hours; and
- .3 to extend the deadline for submission of bulky information documents from 13 weeks to 9 weeks, if they were submitted in electronic format, and to amend the Committees' Guidelines accordingly.

21.2 The Committee noted that, as requested by MSC 83, the Secretariat had prepared proposed draft amendments to the Committees' Guidelines (MSC 84/21, annex), which reflected the relevant decisions taken by MSC 83 (see above paragraph 21.1) and also included the revised standard format for the IMO document (Circular letter No.2831), and that the same proposed draft amendments had been submitted to MEPC 57 (MEPC 57/WP.4) for consideration.

21.3 The Committee further noted (MSC 84/2/3, paragraph 17) that MEPC 57 had considered the report of the 2007 Chairmen's meeting and, having concurred with the decisions of MSC 83, approved the draft amendments to the Committees' Guidelines. The MEPC requested the Secretariat, once the draft amendments to the Guidelines had also been approved by MSC 84, to prepare a revised text of the Guidelines incorporating the amendments for dissemination by a new MSC-MEPC circular, which should supersede MSC-MEPC.1/Circ.1.

21.4 The Committee approved the draft amendments (MSC 84/21, annex) and requested the Secretariat to prepare and circulate the revised Committees' Guidelines by means of MSC-MEPC.1/Circ.2, which incorporate the approved amendments and supersede the existing Guidelines.

## Guidelines on the application of the Strategic Plan and the High-level Action Plan

21.5 The Committee noted (MSC 84/21, paragraphs 6 and 7) that C/ES.24 had established a correspondence group to develop guidelines on the application of the Strategic Plan and the High-level Action Plan, which would be reviewed by the *ad hoc* Council Working Group on the Organization's Strategic plan (CWGSP), so as to finalize and approve the guidelines at its one hundred and first session in November 2008. It also noted that, in operative paragraph 5 of resolution A.990(25) on High-level Action Plan of the Organization and priorities for the 2008-2009 biennium, the Committee had been requested to review and revise the

Committees' Guidelines on the organization and method of work in the light of the aforementioned guidelines to be developed by the Council.

## **Report of the 2008 Chairmen's meeting**

21.6 The Committee was advised that a meeting of the Chairmen of the Committees and sub-committees had been held on Saturday, 10 May 2008 and that the report thereof was contained in document MSC 84/WP.10. In this regard, the Committee noted that the issues related to the Strategic Plan for the Organization and High-level Action Plan (MSC84/22/20), on the reduction of meeting weeks (MSC 84/22/1, paragraph 3.1) and number of meeting groups (MSC 84/2/3, paragraph 18) had been addressed by the Chairmen's meeting. The Committee considered part of the report of the Chairmen's meeting on the issue of number of meeting groups (MSC 84/WP.10, paragraphs 27 to 30) and took action as indicated in the following paragraphs. The aforementioned other issues were considered under agenda item 22 (Work programme).

### Number of meeting groups

21.7 The Committee noted (MSC 84/2/3, paragraph 18) that, at MEPC 57, the delegation of the Bahamas, as supported by several delegations, had expressed the concern that the Committees' Guidelines were not being adhered to and that the increased number of working, drafting, technical and correspondence groups, including intersessional meetings, resulted in unrealistic timescales and priorities being allocated to work programme items as well as taxing the resources of Member Governments, in particular, the developing and least developed countries, as well as the Secretariat. Following the recommendation of the delegation that the next Chairmen's meeting should discuss ways to resolve these issues, the MEPC Chairman had assured MEPC 57 that these issues would be considered by the Chairmen's meeting to be held during MSC 84.

21.8 The Committee recalled that the same issue had been raised by the delegation of the Bahamas at MEPC 56 and by ICS in a letter to the Chairman of the Committee and the issue was considered at the 2007 Chairmen's meeting during MSC 83. In this regard, MSC 83 had recognized that the concerns raised by the delegation of the Bahamas and ICS were not new problems, in particular, in the case of the MEPC in the past few years and had agreed that the Committees' Guidelines should be strictly adhered to. At the same time it was recognized that in certain circumstances some flexibility was needed.

21.9 The Committee noted that the Chairmen's meeting had reiterated its recommendations of its last meeting, which MSC 83 and MEPC 57 had agreed to, that:

- .1 intersessional working groups and technical groups should not be held at the same time as Committee or sub-committee meetings; and
- .2 splinter groups of a working group, if established, should meet outside normal working hours.

21.10 The Committee further noted the recommendation of the meeting that the agenda management procedures specified in the Committees' Guidelines should be strictly adhered to and this will reduce the need for various groups at a meeting as well as intersessional meetings.

## **Review of the Committees' Guidelines**

21.11 The Committee noted that the Chairmen's meeting had agreed to review the Committees' Guidelines at the next meeting in the context of management of the work programme under the Strategic plan and planned outputs (see paragraph 22.82).

## 22 WORK PROGRAMME

## New work programme items proposed by Member Governments and international organizations

## General

22.1 Taking into account the recommendations made by the Sub-Committees which had met since MSC 83 (MSC 84/22, MSC 84/22/Add.1 and MSC 84/22/Add.2); various proposals for new work programme items submitted to the session by the Member Governments and international organizations; a preliminary assessment of such proposals, undertaken by the Chairman with the assistance of the Secretariat, in accordance with the relevant provisions of the Guidelines on the organization and method of work (MSC 84/WP.1) and decisions taken during the session, the Committee reviewed the work programmes of the Sub-Committees and the provisional agendas for their forthcoming sessions and took action as indicated hereunder.

22.2 The Committee recalled that, with regard to the Committee's method of work relating to the consideration of proposals for new work programme items, it had agreed at MSC 78 that the objective of the Committee when discussing these proposals was to decide, based upon justification provided by Member Governments in accordance with the Guidelines on the organization and method of work, whether the new item should or should not be included in the sub-committee's work programme. A decision to include a new item in a sub-committee's work programme does not mean that the Committee agreed with the technical aspects of the proposal. If it is decided to include the item in a sub-committee's work programme, detailed consideration of the technical aspects of the proposal and the development of appropriate requirements and recommendations should be left to the sub-committee concerned.

22.3 The Committee noted that MEPC 57 had approved the work programmes of the BLG and FSI Sub-Committees as well as the provisional agendas for BLG 13 and FSI 16, and the environment-related items on the work programmes of other sub-committees.

22.4 Prior to the Committee conducting its assessment of the proposed new work items submitted to the session, the delegation of the Netherlands supported by a number of other delegations, expressed its concern that some of the proposed new items did not have a clear reference to the planned outputs contained in resolution A.990(25), which is linked to the Organization's budget or new proposed planned outputs were developed, and, in their view, the question on related budget should be raised for items proposed to be dealt with during the biennium, also taking into account the impact such proposed work items may have on the existing workload for the particular sub-committees (see also paragraph 22.74).

## SUB-COMMITTEE ON BULK LIQUIDS AND GASES (BLG)

## Outcome of MEPC 57

22.5 The Committee noted that MEPC 57 had agreed to include, in the work programme of the BLG Sub-Committee and the provisional agenda for BLG 13, high-priority items on "Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NOx Technical Code" and on "Amendments to MARPOL Annex I on the use and carriage of heavy grade oil on ships in the Antarctic area", both with a target completion date of 2010.

## Fixed hydrocarbon gas detection systems

22.6 The Committee recalled that, following consideration of document MSC 84/22/7 (France, Finland and Germany) in the context of the FP Sub-Committee's programme, it had agreed that the Sub-Committee should cooperate on the above issue, as necessary and when requested by the FP Sub-Committee (see also paragraph 22.16).

## Work programme of the Sub-Committee and provisional agenda for BLG 13

22.7 The Sub-Committee's work programme, as revised and approved by the Committee, is set out in annex 21. The Secretariat was requested to inform the MEPC accordingly.

22.8 The Committee approved the provisional agenda for BLG 13, as set out in annex 22 and requested the Secretariat to inform the MEPC accordingly.

## SUB-COMMITTEE ON DANGEROUS GOODS, SOLID CARGOES AND CONTAINERS (DSC)

### **Documentation for dangerous goods in packaged form**

22.9 Following consideration of document MSC 84/22/11 (United States), proposing to review documentation requirements for dangerous goods in packaged form and, if necessary, to prepare amendments to SOLAS regulation VII/4 and to the provisions of the IMDG Code that pertain to documentation, in order to remove ambiguities and inconsistencies in documentation aiming at facilitation of the safe and efficient transportation of dangerous goods in packaged form by sea, the Committee agreed to include, in the work programme of the DSC Sub-Committee and provisional agenda for DSC 13, a low-priority item on "Review of documentation requirements for dangerous goods in packaged form", with a target completion date of 2009.

### **Effectiveness of the Container Inspection Programme**

22.10 The Committee considered document MSC 84/22/15 (Republic of Korea), proposing to consider the efficacy of the Container Inspection Programme (CIP) in order to encourage Member Governments to submit CIP reports and to develop strategies on how best to utilize the information submitted in accordance with MSC/Circ.1209 on Container Inspection Programmes (CIP) to reduce marine incidents with dangerous goods. The Committee agreed to include, in the work programme of the DSC Sub-Committee, a low-priority item on "Consideration for the efficacy of Container Inspection Programme", with two sessions needed to complete the item.

## Dangerous goods container beacon

22.11 Following consideration of document MSC 84/22/19 (Egypt), proposing that a beacon be installed on a container to facilitate search for, and recovery of, the lost container that carries dangerous goods in case of its falling in the sea, the Committee did not agree to the proposal.

## Work programme of the Sub-Committee and provisional agenda for DSC 13

22.12 The Sub-Committee's work programme, as revised and approved by the Committee, is set out in annex 21. In this context, the Committee noted document MSC84/22/3, supporting the inclusion of the item on "Amendments to the International Convention for Safe Containers, 1972" in the Sub-Committee's work programme.

22.13 The Committee approved the provisional agenda for DSC 13, as set out in annex 22.

## SUB-COMMITTEE ON FIRE PROTECTION (FP)

## Tenders operating from passenger ships

22.14 The Committee recalled that, following consideration of documents MSC 84/22/8 (United Kingdom) and MSC 84/22/24 (CLIA) in the context of the DE Sub-Committee's work programme, it had agreed to include in the work programme of the FP Sub-Committee, a high-priority item on "Safety provisions applicable to tenders operating from passenger ships", with three sessions needed to complete the item, assigning the DE Sub-Committee as a coordinator (see also paragraphs 22.51).

## Uniform implementation of SOLAS regulations II-1/8-1, II-2/21 and II-2/22

22.15 Following consideration of document MSC 84/22/2 (Italy), proposing to prepare explanatory notes for the recently adopted SOLAS amendments related to the safe return to port concept for passenger ships with a view to ensuring a uniform implementation of SOLAS regulations II-1/8-1, II-2/21 and II-2/22, and document MSC 84/INF.3, providing additional information on the work already carried out by the shipping industry towards consistent application of the aforementioned requirements, the Committee agreed to include, in the work programme of the FP Sub-Committee and the provisional agenda for FP 53, a high-priority item on "Explanatory notes for the application of the safe return to port requirements", with a target completion date of 2010, in cooperation with the DE and SLF Sub-Committees, as necessary and when requested by the FP Sub-Committee.

## Fixed hydrocarbon gas detection systems

22.16 The Committee considered document MSC 84/22/7 (France, Finland and Germany), proposing to expand the scope of the existing item on "Fixed hydrocarbon gas detection systems on double-hull oil tankers", in order to also consider means to avoid explosions in double spaces of double-hull oil tankers, after detection of hydrocarbon gas and, having noted the views of the observers from ICS, INTERTANKO AND OCIMF that the master should decide on the actions to be taken in such circumstances and that industry guidelines already adequately address this issue (i.e. ISGOTT), agreed to expand the existing high-priority item on "Fixed hydrocarbon gas detection systems on double-hull oil tankers" in the work programme of the FP Sub-Committee to consider also means to avoid explosions in double spaces of double-hull oil tankers after gas

detection, in cooperation with the BLG Sub-Committee as necessary and when requested by the FP Sub-Committee, and extended the target completion date of the expanded item to 2010.

## Work programme of the Sub-Committee and provisional agenda for FP 53

22.17 The Sub-Committee's work programme, as revised and approved by the Committee, is set out in annex 21.

22.18 The Committee approved the provisional agenda for FP 53, as set out in annex 22.

## SUB-COMMITTEE ON FLAG STATE IMPLEMENTATION (FSI)

## Safety of persons rescued at sea

22.19 The Committee considered document MSC 84/22/9 (Italy and Spain), proposing to examine the situation facing the crews of the ships that rescue persons at sea, with the aim of finding a satisfactory solution for the ships and providing adequate arrangements for those rescued at sea to ensure that they are disembarked at a safe place within a reasonable time, and noted that the FAL Committee has a correspondence group addressing issues related to the disembarkation of persons rescued at sea, which will be considered by FAL 35.

22.20 Having agreed from the outset that the proposed new work item met the criteria set out in the guidelines for approval of such work items, the Committee had divergent views on which body should be assigned the primary responsibility for the work to be undertaken.

22.21 The delegation of Malta, supported by several delegations, was of the strong opinion that the matter should be considered by the COMSAR Sub-Committee, or by the FAL Committee, and not by FSI Sub-Committee since it would have the technical expertise to deal with the complex issues involved, taking into account that issues involved were primarily focused on search and rescue.

22.22 The delegations of Spain and Italy, also supported by several delegations, were of the view that the matter should be addressed by the FSI Sub-Committee as this work was related to the implementation of the relevant SOLAS and SAR amendments and, in particular, the associated Guidelines as contained in resolution MSC.167(78).

22.23 Of the delegations who spoke on the issue, many delegations, while agreeing with the proposal for a new work programme item and agreeing that it was a major issue, did not specify the appropriate IMO body to deal with consideration of the matter, other than it should be addressed by the Organization.

22.24 Other delegations expressed caution in dealing with such a very sensitive matter, and referred to the fact that the Convention amendments only came into force in July 2006 as a result of an extremely delicate compromise which was achieved at MSC 78 after discussion over several years.

22.25 Following the discussion and having noted that the COMSAR Sub-Committee has the required expertise to consider measures on safety of persons at sea and the SOLAS and SAR amendments were developed by that Sub-Committee, the Committee agreed to include, in the work programmes of the COMSAR and FSI Sub-Committees, a high-priority item on "Measures to protect the safety of persons rescued at sea", with two sessions needed to complete the item,

and in the provisional agendas for COMSAR 13 and FSI 17; and, on practical grounds, decided to request the COMSAR Sub-Committee to consider the new item first and later on, in cooperation with the FSI Sub-Committee, to progress it in time for completion within the agreed time frame.

## Arrangements for bottom inspections for passenger ships

22.26 Following consideration of document MSC 84/22/10 (Bahamas), proposing to develop guidelines to ensure that sound technical judgement is exercised by Administrations which allow their passenger ships (other than ro-ro passenger ships) to have an inspection of the outside of the ship's bottom carried out in water, rather than in dry dock, the Committee, having included the relevant item in the DE Sub-Committee work programme, agreed to instruct the FSI Sub-Committee to develop appropriate amendments to the Survey Guidelines under the HSSC (resolution A.997(25)) to explain the possibility of alternative arrangement where one bottom inspection in dry dock may be substituted by a bottom inspection with the ship in water, (see also paragraph 22.52).

## **Development of a Code for Recognized Organizations**

22.27 The Committee considered document MSC 84/22/13 (Austria et al), proposing to develop a Code for Recognized Organizations to assist Administrations in meeting their responsibilities in recognizing, authorizing and monitoring their ROs; gather all the applicable RO requirements in a single IMO mandatory instrument; and amend the existing and applicable legal framework to ensure that the ROs are correctly audited by qualified and independent auditors with respect to the Code. The delegation of the Cook Islands reminded the Committee that the Organization had already established the Code for the Implementation of Mandatory IMO Instruments, which includes all the elements necessary to ensure that adequate procedures were followed in respect of the relationship between a flag State and its recognized organizations. Therefore, the delegation, with the support of a number of other delegations, questioned the need for the development of another code. However, the Committee agreed to include, in the work programme of the FSI Sub-Committee, a high-priority item on "Development of a Code for Recognized Organizations", with two sessions needed to complete the item, and instructed the FSI Sub-Committee to include the item in the provisional agenda for FSI 17.

22.28 In noting the above decision, the delegation of Panama, stated that the proposal for the above new work programme item did not demonstrate a compelling need since IMO already has adequate guidance on this matter. The full text of the statement is reproduced in annex 23.

22.29 The delegation of Saint Kitts and Nevis observed that many delegations stated that, in view of already existing mandatory and non-mandatory instruments, there was no compelling need for this work programme item, and that lack of clarity of the proposal was also raised by many delegations. The delegation pointed out that, as per various conventions, it is the Administration that is responsible for the accuracy of certificates issued. In view of this, it is the right and responsibility of the Administrations to monitor recognized organizations appointed by them.

## **Consideration of the Consolidated Audit Summary Report**

22.30 The Committee, having noted that A 25 requested (MSC 84/2/2, paragraph 6) the Committee and the MEPC to consider the consolidated audit summary report (A 25/8/2) and inform the Council, in due course, of the outcome of their consideration and that MEPC57, following the request of the Assembly, referred document A 25/8/2 to the FSI Sub-Committee for consideration and report to the MEPC, agreed to also instruct the FSI Sub-Committee to consider the audit summary report in part relating to the Committee's competence and report to MSC 86 for the Committee to inform the Council, as appropriate.

## Work programme of the Sub-Committee and provisional agenda for FSI 16

22.31 The Sub-Committee's work programme, as revised and approved by the Committee, is set out in annex 21. The Secretariat was requested to inform the MEPC accordingly.

22.32 The Committee approved the provisional agenda for FSI 16, as set out in annex 22 and requested the Secretariat to inform the MEPC accordingly.

22.33 Having noted, in the course of the discussion on new work programme items, some potential ambiguities regarding the expertise of the FSI Sub-Committee and confusion based on the name of this body, the Chairman of the FSI Sub-Committee recalled that, in accordance with its agreed terms of reference (MSC 80/20), the Sub-Committee is tasked with the consideration of matters related to the implementation of IMO instruments by States in their capacity as flag, port and coastal States, the development of instruments requiring technical expertise, as demonstrated by the outcome of its work.

22.34 In this context, the Chairman of the FSI Sub-Committee, supported by those chairmen of other sub-committees who intervened on this issue, invited Member States to continue providing a proper level of technical expertise in their delegations to the sub-committees in accordance with their work programmes.

### SUB-COMMITTEE ON RADIOCOMMUNICATIONS AND SEARCH AND RESCUE (COMSAR)

### Tenders operating from passenger ships

22.35 The Committee recalled that, following consideration of documents MSC 84/22/8 (United Kingdom) and MSC 84/22/24 (CLIA) in the context of the DE Sub-Committee's work programme, it had agreed to include in the work programme of the COMSAR Sub-Committee, a high-priority item on "Safety provisions applicable to tenders operating from passenger ships", with three sessions needed to complete the item, assigning the DE Sub-Committee as a coordinator (see also paragraphs 22.51).

### Rescue of persons at sea

22.36 The Committee recalled that, following consideration of documents MSC 84/22/9 (Italy and Spain) in the context of the FSI Sub-Committee's work programme, it had agreed to include in the work programme of the COMSAR Sub-Committee and the provisional agenda for COMSAR 13, a high-priority item on "Measures to protect the safety of persons rescued at sea", with a target completion date of 2010, and instructed the above Sub-Committees to take into account the work being carried out by the FAL Committee, as appropriate (see also paragraph 22.25).

## Work programme of the Sub-Committee and provisional agenda for COMSAR 13

22.37 The Sub-Committee's work programme, as revised and approved by the Committee, is set out in annex 21.

22.38 The Committee approved the provisional agenda for COMSAR 13, as set out in annex 22.

## SUB-COMMITTEE ON SAFETY OF NAVIGATION (NAV)

## Review of the Principles for establishing the safe manning levels of ships – Mandatory provisions in SOLAS

22.39 The Committee recalled that, following consideration of document MSC 84/22/22 (United Kingdom) in the context of the STW Sub-Committee's programme, it had agreed that the Sub-Committee should cooperate on the above issue, as necessary and when requested by the STW Sub-Committee (see also paragraph 22.68).

## Tenders operating from passenger ships

22.40 The Committee recalled that, following consideration of documents MSC 84/22/8 (United Kingdom) and MSC 84/22/24 (CLIA) in the context of the DE Sub-Committee's work programme, it had agreed to include in the work programme of the NAV Sub-Committee, a high-priority item on "Safety provisions applicable to tenders operating from passenger ships", with three sessions needed to complete the item, assigning the DE Sub-Committee as a coordinator (see also paragraph 22.51).

## Safety zones around artificial islands, installations and structures in the Exclusive Economic Zone (EEZ)

22.41 The Committee considered document MSC 84/22/4 (Brazil and United States), proposing to develop comprehensive guidelines for the consideration of requests for safety zones around artificial islands, installations and structures larger than 500 metres in Exclusive Economic Zones and providing an example of such guidelines, and agreed to include, in the work programme of the NAV Sub-Committee, a high-priority item on "Guidelines for consideration of requests for safety zones larger than 500 metres around artificial islands, installations and structures in the EEZ", with two sessions needed to complete the item.

22.42 In this regard, the Committee noted the views of several delegations that other issues (e.g., safety zones around offshore wind farms, notification areas, etc.) should be considered under this new work item and instructed the Sub-Committee to take these views into account.

### Voyage data recorders

22.43 The Committee considered documents MSC 84/22/17 and MSC 84/22/18 (Egypt), proposing to consider, under existing item on "Amendments to the Performance Standards for VDR and S-VDR":

.1 in the context of failure of VDR, definition of basic elements of VDR data connection, allowance for the possibility of a period of repair for the elements

connected to VDR and increase of the flexibility in order to decrease ship detention in case of VDR failure; and

.2 in the context of attachment of floating capsule, the need to attach a floating capsule to the fixed one minimizing the time and risks of search for capsule and reducing search and rescue cost.

22.44 Following the discussion, the Committee agreed to expand the existing item on "Amendments to the Performance standards for VDR and S-VDR" in the work programme of the NAV Sub-Committee to consider the proposal contained in document MSC 84/22/18, and increased the number of sessions needed to complete this work item to three sessions, having decided that the proposal for the new work item in document MSC 84/22/17 did not demonstrate the compelling need in accordance with guidelines.

## Work programme of the Sub-Committee and provisional agenda for NAV 54

22.45 The Sub-Committee's work programme, as revised and approved by the Committee, is set out in annex 21.

22.46 The Committee approved the provisional agenda for NAV 54, as set out in annex 22.

## SUB-COMMITTEE ON SHIP DESIGN AND EQUIPMENT (DE)

## Uniform implementation of SOLAS regulations II-1/8-1, II-2/21 and II-2/22

22.47 The Committee recalled that, following consideration of document MSC 84/22/2 (Italy) in the context of the FP Sub-Committee's programme, it had agreed that the Sub-Committee should cooperate on the above issue, as necessary and when requested by the FP Sub-Committee (see also paragraph 22.15).

### Thermal performance of immersion suits

22.48 The Committee considered document MSC 84/22/5 (Japan), proposing to amend the requirements of the LSA Code and the Revised recommendation on testing of life-saving appliances relevant to the evaluation of the thermal performance of immersion suits, with a view to introducing a new test procedure based on the "reference test device" concept, and agreed to include, in the work programme of the DE Sub-Committee, a high-priority item on "Thermal performance of immersion suits", with two sessions needed to complete the item.

### **Rectification of requirements for life-saving appliances**

22.49 The Committee considered document MSC 84/22/6 (Japan), proposing to rectify errors and inconsistencies in the Revised recommendation on testing of life-saving appliances, as amended by resolutions MSC.200(80) and MSC.226(82), and agreed to include, in the work programme of the DE Sub-Committee, a high-priority item on "Amendments to the Revised recommendation on testing of life-saving appliances", with two sessions needed to complete the item.

## Tenders operating from passenger ships

22.50 The Committee considered document MSC 84/22/8 (United Kingdom), proposing to develop provisions for the design, equipment and operation of tenders carrying passengers and crew from passenger ships to shore, to ensure that a consistent approach is adopted, together with document MSC 84/22/24 (CLIA), in which CLIA pointed out that its members have conducted, without serious incidents, numerous tender vessel operations each year involving tens of thousands of passengers and, therefore, CLIA could not support the proposal by the United Kingdom without details of tender vessel casualties and more specific guidance as to the scope of the work to be undertaken, bearing in mind that the above proposal might result in over-regulation of an already safe operation.

22.51 Following the discussion, the Committee agreed to include, in the work programmes of the DE, FP, COMSAR, NAV, SLF and STW Sub-Committees, a high-priority item on "Safety provisions applicable to tenders operating from passenger ships", with three sessions needed to complete the item, assigning the DE Sub-Committee as a coordinator.

## Arrangements for bottom inspections for passenger ships

22.52 The Committee considered document MSC 84/22/10 (Bahamas), proposing to develop guidelines to ensure that sound technical judgement is exercised by Administrations which allow their passenger ships (other than ro-ro passenger ships) to have an inspection of the outside of the ship's bottom carried out in water, rather than in dry dock, and to ultimately amend the Survey Guidelines under the HSSC (resolution A.997(25) to explain the possibility of alternative arrangement where one bottom inspection in dry dock may be substituted by a bottom inspection with the ship in water, and agreed to include, in the work programme of the DE Sub-Committee, a high-priority item on "Alternative arrangements for bottom inspection requirements for passenger ships other than ro-ro passenger ships", with one session needed to complete the item (see also paragraph 22.26).

## New work programme proposed by DE 51

22.53 In consideration of the proposal by DE51 to include a new item on "Definition of the term bulk carrier" in the Sub-Committees work programme, the Committee recalled that the matter had been dealt with under agenda item 11 (Ship design and equipment) (see paragraphs 11.24 to 11.30).

## Work programme of the Sub-Committee and the provisional agenda for DE 52

22.54 The Sub-Committee's work programme, as revised and approved by the Committee, is set out in annex 21.

22.55 The Committee, approved the provisional agenda for DE 52, as set out in annex 22.

## SUB-COMMITTEE ON STABILITY AND LOAD LINES AND FISHING VESSELS SAFETY (SLF)

## Uniform implementation of SOLAS regulations II-1/8-1, II-2/21 and II-2/22

22.56 The Committee recalled that, following consideration of document MSC 84/22/2 (Italy) in the context of the FP Sub-Committee's programme, it had agreed that the Sub-Committee
should cooperate on the above issue, as necessary and when requested by the FP Sub-Committee (see also paragraph 22.15).

## Tenders operating from passenger ships

22.57 The Committee recalled that, following consideration of documents MSC 84/22/8 (United Kingdom) and MSC 84/22/24 (CLIA) in the context of the DE Sub-Committee's work programme, it had agreed to include in the work programme of the SLF Sub-Committee, a high-priority item on "Safety provisions applicable to tenders operating from passenger ships", with three sessions needed to complete the item, assigning the DE Sub-Committee as a coordinator (see also paragraph 22.51).

## Specific ship stability requirements for ro-ro passenger ships

22.58 The Committee considered document MSC 84/22/12 (Austria *et al*), proposing to review the damage stability requirements of the revised SOLAS chapter II-1, which will enter into force on 1 January 2009, to ensure that the issue of water on deck, which is a specific safety concern for ro-ro passenger ships, is adequately addressed within those requirements; and document MSC 84/22/23 (CESA), wherein, supporting in general, the proposal to review ship stability requirements for ro-ro passenger ships, CESA, while pointing out that the combined use of the revised SOLAS chapter II-1 and the Stockholm Agreement would not be appropriate, as they are based on different concepts, expressed the opinion that the decision could be taken only after the technical background of the proposal is made available and that the scope of the review should also address the issue of compatibility of the revised SOLAS chapter II-1 damage stability requirements with other legislation still regulating the design of ro-ro passenger ships.

22.59 Following the discussion, the Committee agreed to include, in the work programme of the SLF Sub-Committee, a high-priority item on "Damage stability regulations for ro-ro passenger ships", with two sessions needed to complete the item, and instructed SLF 51 to give a preliminary consideration to the matter and to include the item in the provisional agenda for SLF 52. In this regard, Member Governments and international organizations were invited to submit any studies on the above matter to SLF 52.

## Preparation of a draft Agreement on the Implementation of the 1993 Torremolinos Protocol

22.60 The Committee considered document MSC 84/22/21 (Iceland), proposing to prepare a draft Agreement on the implementation of the 1993 Torremolinos Protocol to facilitate and expedite the earliest possible entry into force of the 1993 Torremolinos Protocol, as called for under resolution A.1003(25) with a view to identifying the revisions to the 1993 Protocol which may be needed to make the Protocol acceptable to the required number of Governments to ensure the early entry into force, together with document MSC 84/22/16 (Secretariat), summarizing the outcome of Joint FAO/ILO Working Group on Illegal, Unreported and Unregulated Fishing and Related Matters (JWG), MSC 83 and A 25, taking into account the conclusions of the Beijing Regional Seminar on Implementation of the 1993 Torremolinos Protocol; and inviting the Committee to consider including a new work programme in the Sub-Committee's work programme to explore options to facilitate and expedite the earliest entry into force of the Protocol.

22.61 In considering the matter, the Committee noted that the JWG considered a proposal by the consultant for adoption of a new Protocol and, with regard to revision of provisions of the Protocol, two options for achieving this, i.e. statement of understanding for suspending the application of provisions of the Protocol and agreement relating to the implementation of the Protocol and recommend that IMO, in cooperation with FAO explore options and in particular, the possibility of preparation of a draft Agreement relating to the implementation of the Protocol. In this regard, the Committee recalled that MSC 83 had concurred with the recommendations of JWG.

22.62 Following the discussion, the Committee agreed to include, in the work programme of the SLF Sub-Committee, a high-priority item on "Development of an agreement on the implementation of the 1993 Torremolinos Protocol", with two sessions needed to complete the item, in cooperation with other appropriate sub-committees as necessary and when requested by the SLF Sub-Committee, and instructed SLF 51 to give a preliminary consideration to the item and to include it in the provisional agenda for SLF 52.

## Outcome of MEPC 57

22.63 The Committee noted that MEPC 57, in considering documents MEPC 57/20 and MEPC 57/INF.18 regarding the impact small pleasure and fishing craft have on the marine environment and possible action by IMO, had invited the Committee to consider, in the context of the work on the safety of fishing vessels, adding the issue of reducing oil discharges to the work programme and, following the discussion, agreed to refer the documents to the Sub-Committee and instruct it to consider the issue and advise the Committee as appropriate.

## Work programme of the Sub-Committee and the provisional agenda for SLF 51

22.64 The Sub-Committee's work programme, as revised and approved by the Committee, is set out in annex 21.

22.65 The Committee approved the provisional agenda for SLF 51, as set out in annex 22.

## SUB-COMMITTEE ON STANDARDS OF TRAINING AND WATCHKEEPING (STW)

#### **Tenders operating from passenger ships**

22.66 The Committee recalled that, following consideration of documents MSC 84/22/8 (United Kingdom) and MSC 84/22/24 (CLIA) in the context of the DE Sub-Committee's work programme, it had agreed to include in the work programme of the STW Sub-Committee, a low-priority item on "Safety provisions applicable to tenders operating from passenger ships", with three sessions needed to complete the item, assigning the DE Sub-Committee as a coordinator (see also paragraph 22.51).

#### Model procedures for executing shipboard emergency measures

22.67 Following consideration of document MSC 84/22/14 (Republic of Korea), proposing that a model procedure for executing shipboard emergency measures be developed to standardize the emergency drills for crew in case marine emergency on board and port State control (PSC) inspections for PSC officers, the Committee agreed to include, in the work programme of the STW Sub-Committee, a low-priority item on "Development of model procedure for executing shipboard emergency measures", with two sessions needed to complete the item.

# Review of the Principles for establishing the safe manning levels of ships – Mandatory provisions in SOLAS

22.68 The Committee considered document MSC 84/22/22 (United Kingdom), proposing to review SOLAS regulation V/14 with a view to making the formal process for the determination of safe manning levels of vessels mandatory, in order to standardize the processes for the determination of safe manning levels, and agreed to include, in the work programme of the STW Sub-Committee and provisional agenda for STW 40, a high-priority item on "Mandatory requirements for determining safe manning", with a target completion date of 2010, in cooperation with the NAV Sub-Committee, as necessary and when requested by the STW Sub-Committee.

22.69 In noting the above decision, several delegations expressed the view that the proposal for the above new work programme item did not demonstrate a compelling need since matters related to safe manning were still under discussion within the STW Sub-Committee.

## Work programme of the Sub-Committee and the provisional agenda for STW 40

22.70 The Sub-Committee's work programme, as revised and approved by the Committee, is set out in annex 21.

22.71 The Committee approved the provisional agenda for STW 40, as set out in annex 22.

#### FOLLOW-UP TO THE TWENTY-FIFTH SESSION OF THE ASSEMBLY

#### General

22.72 Having considered the outcome of the twenty-fifth session of the Assembly (MSC 84/22/1 and MSC 84/22/20) and the action the Committee had been requested to take, the Committee made the following decisions as outlined in paragraphs 22.73 to 22.87 below.

#### Matters relating to specific requests for action in the context of resolutions adopted by A 25

22.73 In the context of resolution A.991(25) – *Programme budget for the twenty-fifth financial period 2008-2009*, the Committee noted that it had been requested, taking into account that the sub-total of the Sub-Committee meeting weeks for 2009 was calculated as seven meeting weeks (not nine meeting weeks), to decide on the two Sub-Committee meetings which will not be held in 2009. The Committee, having been informed that the FAL Committee would not be meeting in 2008, decided that only one Sub-Committee meeting should not be held in 2009. Consequently, the Committee, taking into account the analysis conducted by the Secretariat in consultation with the Committee and Sub-Committee Chairmen for the meeting schedule for 2009 and relevant recommendations of the 2008 Chairmen's Meeting, decided that SLF 52 should be held in 2010 in lieu of 2009.

22.74 In this context, the United Kingdom delegation commented that when the budget for the 2010-2011 biennium is considered by Council, attention will be given to the number of meeting weeks. Given that many members of Council have a national position of zero real growth, some may consider that seven meeting weeks is now the norm. In reply, the Director, Maritime Safety Division, confirmed that the Committee Chairmen will prepare proposals for the number of meeting weeks needed in the 2010-2011 biennium for consideration at MSC 85.

- 22.75 The Committee noted that it had been requested by A 25:
  - .1 in the context of resolution A.996(25) *Code for the Implementation of Mandatory IMO Instruments*, 2007, to keep, in cooperation with the MEPC, the Code under review and, in coordination with the Council, to propose amendments thereto to the Assembly;
  - .2 in the context of resolution A.997(25) *Survey Guidelines under the Harmonized System of Survey and Certification, 2007*, to keep, in cooperation with the MEPC, the Survey Guidelines under review and to amend them as necessary;
  - .3 in the context of resolution A.999(25) *Guidelines on voyage planning for passenger ships operating in remote areas,* to keep the Guidelines under review and to amend them as appropriate;
  - .4 in the context of resolution A.1001(25) Criteria for the provision of mobile satellite communication systems in the Global Maritime Distress and Safety System (GMDSS), to:
    - .1 apply the criteria set out in the annex to the resolution, through the procedure set out in section 2 of the annex to the resolution, to evaluate satellite systems notified by Governments for possible recognition for use in the GMDSS, within the context of the relevant regulations of SOLAS chapter IV;
    - .2 ensure that mobile satellite communication systems recognized by the Organization for use in the GMDSS are compatible with all appropriate SOLAS requirements, and also that such recognition takes into account existing operational procedures and equipment performance standards;
    - .3 keep the criteria under review and to take appropriate action as necessary to secure the long-term integrity of the GMDSS; and
    - .4 in the context of resolution A.1002(25) *Piracy and armed robbery against ships in waters off the coast of Somalia,* to review and update, as a matter of urgency, MSC/Circ.622/Rev.1, MSC/Circ.623/Rev.3 and resolution A.922(22), taking into account current trends and practices, and recalled that the matter had been dealt with under agenda item 17 (Piracy and armed robbery against ships) (see also paragraphs 17.7 and 17.24).

#### Strategic plan of the Organization and High-level action plan and priorities

## General

22.76 The Committee noted the information, in document MSC 84/22/20 (Secretariat), on the action requested by A 25 in the context of resolution A.989(20) on the Strategic plan for the Organization and resolution A.990(25) on the High-level action plan of the Organization and priorities for the 2008-2009 biennium; and on the relevant decisions of the Council, at its twenty-fourth extraordinary session, and the Assembly, at its twenty-fifth session, in particular on those referred to in paragraphs 2 and 3 of the document.

22.77 In particular, the Committee noted that, in the context of the aforementioned resolution A.989(25), it had been requested to bear in mind, when making recommendations for the work programme during the Strategic Plan period, the desirability of not scheduling more than one diplomatic conference in each year, save in exceptional cases, and, in the context of resolution A.990(25), to:

- .1 ensure, when reporting on the work to the Assembly at its twenty-sixth regular session and to the Council at its sessions during the 2008-2009 biennium, that the Committee reports progress towards fulfilling the Organization's aims and objectives using the framework of the strategic directions, high-level actions and planned biennial outputs;
- .2 ensure, when considering proposals for new work programme items, that, in accordance with the Guidelines on the organization and method of work, the issues to be addressed are those which fall within the scope of the Strategic Plan and the High-level Action Plan; and
- .3 review and revise the Guidelines on the organization and method of work in the light of the guidelines, developed by the Council, on the application of the Strategic Plan and the High-level Action Plan.

22.78 In the context of this item, the Committee noted that the Council, at its twenty-fourth extraordinary session, had agreed that greater emphasis needs to be given to ongoing efforts in the following areas:

- .1 addressing the safety of non-Convention ships;
- .2 monitoring and acting on, as may be necessary, the unexpected increase in accidents, particularly in the tanker sector, which arose in late 2006/early 2007;
- .3 in this regard, continually strengthening IMO's role with respect to the human element;
- .4 improving the PSC non-compliance rate by promoting greater efforts by all parties in the chain of responsibility;
- .5 addressing the safety of life and navigation in waters affected by acts of piracy and armed robbery; and
- .6 promoting and raising the profile, quality and environmental consciousness of shipping, and ensuring that these are permanent tasks of all concerned.

22.79 The Committee further noted that the Council, at its twenty-fourth extraordinary session, having approved the updated Strategic Plan for the Organization (for the six-year period 2008-2013) and updated High-level Action Plan of the Organization and priorities for the 2008-2009 biennium, for submission to A 25 for adoption, had endorsed related recommendations for necessary action, as applicable, by all IMO organs (which aimed at promoting increased coherence, through the Organization, in the tasks of strategic planning, work programme construction, budgeting, performance monitoring and assessment of results and instilling, in IMO's day-to-day work, a culture of systematic and permanent referral to the Strategic and High-level Action Plans), as follows:

- .1 all IMO organs should, sufficiently early in their agendas for each session, set aside adequate time for the systematic consideration of the high-level actions and their associated priorities, and their connection to the strategic directions;
- .2 all IMO organs should ensure that:
  - .1 their planned activities and, hence, the outputs thereof, are accurately and concisely described in the High-level Action Plan; and
  - .2 the production of such outputs is systematically and regularly monitored;
- .3 when considering their work programmes and provisional agendas for their next sessions, all IMO organs should, under each item, cross-reference the related strategic directions and high-level actions;
- .4 Sub-Committees should, in reporting to the Committees on their work programmes, report on the status of their planned outputs;
- .5 guidelines on the application of, and reporting on, the Strategic and High-level Action Plans should be developed, with input from all Chairmen, to facilitate the work of all IMO organs by promoting a greater understanding within the Organization, of the interconnection between the Strategic and High-level Action Plans and the planned biennial outcomes. They should include guidance for the assessment of work programme items and for the format and content of reports on work carried out by the respective IMO organs;
- .6 all IMO documents, especially proposals for new work programme items (as already required by the Committees' revised Guidelines on organization and methods of work), should demonstrate, where feasible, the linkages to the Strategic and High-level Action Plans by including, in the summary table at the beginning of each document, references to the related strategic direction(s), high-level action(s) and planned output(s);
- .7 the Council and the Committees should issue, possibly as an information paper that could be prepared by the respective Chairmen with the Secretariat, following the conclusion of their respective sessions, a table indicating the status of their outputs;
- .8 the Secretariat should prepare regularly a similar table on the status of its own outputs, for consideration by the Council;
- .9 the report on the delivery of planned biennial outputs should, as from the 2008-2009 biennium, be annexed to the report of the Council to the Assembly on the work of the Organization since the previous session of the Assembly,

and that, in addition, the Council, at its ninety-eighth session, when considering the recommendations of the aforementioned group at its sixth session, had agreed, *inter alia*, that:

.10 in identifying and articulating their planned outputs, the Committees should, firstly, give full consideration to ensuring that their outputs will contribute to the Organization meeting its aims and objectives as described in the high-level

actions and strategic directions of the Strategic Plan. In so doing, they should also consider how they can each address all of the agreed high-level actions;

- .11 to assist the work of the Committees in identifying their planned outputs, they should, where feasible, have before them the planned outputs of other Committees so as to ensure consistency and capture of relevant synergies; and
- .12 the Committees should be invited, when instructed or agreeing to develop new IMO instruments, to specifically indicate a planned time for completion of the work.

22.80 In the context of the discussion of the above recommendations, the Committee considered the proposals by the Chairmen's meeting (MSC 84/WP.10) and took action as outlined in the following paragraphs.

## Table of planned output

22.81 With regard to the recommendations of the Chairmen's meeting on the present table of planned output, the Committee generally agreed that:

- .1 the present table of planned output prepared for resolution A.990(25) contained some parts which do not precisely provide the actual work programmes of the sub-committees and needed to be reviewed by all sub-committee Chairmen together with respective Secretaries to recover any missing work programme items of the sub-committees and improve the accuracy of the table;
- .2 the table of planned output should also be reviewed by the Committees during the biennium in question and should be revised to include any urgent new work programme items and that such updating should be informed to the Council for endorsement; and
- .3 the table of planned output should also provide entries on the status of work of the sub-committees on the long-term work programme items which would not yield the final output in the biennium in question,

and, having noted the plan of the Council correspondence group to provide the outcome of the work and any recommendation for the Council in 2009, further agreed to start updating the table of the planned output at this session of the Committee (see document MSC 84/INF.15).

22.82 The Committee agreed that, if the Strategic Plan and the table of planned output are to be used to manage the work programme of the Committees, then proper guidelines should be developed and the Committees' Guidelines should be reviewed accordingly. The Committee noted that the Chairmen's meeting had agreed to discuss this issue at the next meeting in 2009 in depth and invited Chairmen to provide any proposals for consideration at the next session. In this context, the Committee agreed that the agenda management procedure specified in paragraphs 3.13 to 3.25 of the Committees' Guidelines should be applied so that the agendas of all the Sub-Committees are manageable.

## Recommendations of a general nature relating to preparation of the High-level Action Plan

22.83 The Committee considered the Chairmen's meeting recommendations regarding Council's recommendations referred to in paragraphs 22.79.1, .2, .10, .11 and .12 and agreed to their inclusion in the Guidelines on the organization and method of work, as appropriate, so that the Committee can make best use of them when preparing the Committee's proposals for the High-level Action Plan.

# Cross-referencing of work to the strategic directions, high-level actions and planned outputs

22.84 With regard to the Council's recommendations referred to in paragraph 22.79.3 regarding cross-referencing related to strategic directions and high-level actions; and paragraph 22.78.6 regarding the referencing in the summary table of all IMO documents to Strategic and High-level Action Plans, the Committee noted that the following actions had been taken to date:

- .1 all documents submitted to IMO meetings now contain, in the summary box, reference links to the strategic directions, high-level actions and planned outputs for the biennium;
- .2 that the work programmes of the sub-committees now link each work programme item to the strategic directions, high-level actions and planned outputs for the biennium; and
- .3 that the document on Preliminary assessment of proposals for new work programme items includes an assessment of whether new proposals are within the scope of the Organization's Strategic and High-level Action Plans, including related cross-references,

and agreed that no further administrative cross-referencing activities are needed.

## Format and procedure for reporting of planned outputs by the Sub-Committees

22.85 In respect to the Council's recommendation referred to in paragraph 22.79.4, stating that the sub-committees should, in reporting to the Committees on their work programmes, report on the status of their planned outputs, the Committee agreed to the following procedure:

- .1 the sub-committees, at each respective session, should prepare and annex to their respective reports, a report on the status of their planned outputs in the High-level Action Plan for the respective biennium in the format proposed in the annex to document STW 39/WP.1, for the Committee's consideration and endorsement; and
- .2 regarding the terminologies to be used to describe the status of the planned outputs, the term "ongoing" should not be used and actual progress of work must be reflected and, in addition, the status of work on the long-term work programmes should also be provided.

## Committee's reporting on the status of planned outputs to the Council

22.86 Following the recommendations of the Chairmen's meeting with regard to paragraphs 22.79.7 and 22.79.9, the Committee agreed that the Chairman of the Committee and the Secretariat should, following conclusion of the respective session, issue as an information paper, a table indicating the status of planned outputs, covering any missing work programme items or new work programme as well as the status of progress of long-term work programme items, at each session of the Committee.

# Proposals for the High-level action plan of the Organization and priorities for the 2010-2011 biennium

22.87 In the context of the item, the Committee requested the Secretariat to prepare, in line with the above recommendations, proposals for the High-level Action Plan of the Organization and priorities for the 2010-2011 biennium, for consideration at MSC 86 for submission to C 102 for appropriate action.

## Flexibility on the number of groups

22.88 The Committee, during the discussion on the DE Sub-Committee's work programme, considered the best to ways deal with high-priority items and endorsed the view of the Chairman of the DE Sub-Committee that more flexibility on the number of correspondence and working groups is needed to deal expeditiously with such items. In this regard, the Secretary-General indicated that the Council would consider the Secretary-General's document C 100/15(b) on the Joint Inspection Unit's recommendations, in particular in respect of reduction of the number of meetings, and invited delegations to keep their thoughts in mind when the above document is discussed by the Council.

22.89 The delegation of the Bahamas, supported by a number of delegations shared the concerns raised by the Chairman of the DE Sub-Committee, in particular those concerning the number of working, drafting and correspondence groups required within the constraints of the Guidelines on the organization and method of work. The delegation also drew attention to the burden on Members trying to cope with the demands of the groups, even when there was no implication on the budget of IMO. The number of intersessional and correspondence groups continued to grow and this was an increasing drain on the financial and human resources of Members. One result of this was that decisions were being taken after the work of only a few Member States and observers.

#### INTERSESSIONAL MEETINGS

22.90 Bearing in mind the view of the Council that the number of intersessional working groups should be restricted to the minimum necessary; paragraph 3.40 of the Guidelines on the organization and method of work, as well as the Committee's decision at MSC 66, that all sub-committees should scrutinize the need for intersessional meetings and, only when they consider it essential that such meetings should be held, to submit to the Committee, in good time, a fully justified request for consideration, the Committee, taking into account decisions made under various agenda items, approved the following intersessional meetings:

- .1 the Joint ICAO/IMO Working Group, from 22 to 26 September 2008;
- .2 the ESPH Working Group, in the latter part of 2008;

- .3 *ad hoc* Working Group on Interpretation of the Definition of Bulk Carrier to be held on 24 and 25 November 2008, prior to MSC 85;
- .4 the Working Group on Comprehensive Review of the STCW Convention and the STCW Code, to be held from 8 to 12 September 2008; and
- .5 *ad hoc* LRIT Group (first meeting to be held from 23 to 27 June 2008; second meeting, from 4 to 8 August 2008; third meeting, if necessary, from 15 to 19 September 2008; and final meeting, from 27 to 31 October 2008).

## SUBSTANTIVE ITEMS FOR INCLUSION IN THE COMMITTEE'S AGENDAS FOR THE NEXT TWO SESSIONS AND PROPOSED ARRANGEMENTS FOR MSC 85

## Substantive items for inclusion in the agendas for MSC 85 and MSC 86

22.91 The Committee agreed on the substantive items to be included in the agendas of its eighty-fifth and eighty-sixth sessions, as set out in document MSC 84/WP.7.

## Establishment of working groups during MSC 85

22.92 Recalling the provisions of the Guidelines on the organization and method of work concerning the number of groups which may be established at any given session, the Committee, taking into account decisions made under various agenda items, agreed that working groups on the following items should be established at the Committee's eighty-fifth session:

- .1 goal-based new ship construction standards;
- .2 maritime security; and
- .3 LRIT-related matters,

and agreed to establish a drafting group on consideration and adoption of amendments to mandatory instruments.

## Duration and dates of the next two sessions

22.93 The Committee noted that its eighty-fifth session had been scheduled to take place from 26 November to 5 December 2008; and its eighty-sixth session tentatively in May 2009.

## **23** ANY OTHER BUSINESS

#### **Global Integrated Shipping Information System (GISIS)**

23.1 The Committee recalled that the Global Integrated Shipping Information System (GISIS) was developed by the Secretariat in July 2005, which allows public access to sets of data collected by the Secretariat, and that the Manual for Member States' Administrations and associated disclaimer on the use of reporting facilities was disseminated by circular letter No.2639.

23.2 The Committee noted the updated information provided by the Secretariat on GISIS (MSC 84/23), indicating that there were eight modules available to IMO Members and seven to

the public, i.e., maritime security, maritime casualties and incidents, recognized organizations, port reception facilities, condition assessment scheme, pollution prevention equipment, contact points and ship identification (IMO Members only). Concerning the module on contact points, which was released on 29 February 2008, the Committee noted that Member States can directly update their respective contact details shown in annex 1 to the MSC-MEPC.6 circular series on national contact points responsible for safety and pollution prevention.

23.3 The delegations which intervened expressed appreciation to the Secretariat for the recent improvements in the speed to access various IMO internet-based servers and for the assistance provided by the Secretariat for the handling of their queries regarding GISIS facilities. For further improvement of the access to, and use of GISIS modules, the Secretariat was requested to develop a comprehensive users' manual, covering all facilities, to be updated when new modules are released, such as the PSC and requirements modules which were reported by the Secretariat as progressing towards finalization on the basis of technical development or review by relevant IMO bodies.

23.4 The Committee expressed its appreciation to those Members who use the direct reporting facilities and act as data providers on a regular basis.

## Updates of AIS after 2004 MARPOL amendment

23.5 The Committee noted with appreciation information provided by IALA (MSC 84/23/1) on the need for possible modification of firmware of all AIS units following the entry into force of the 2004 MARPOL amendments, adopted by MEPC 52 by resolution MEPC.118(52) introducing an amendment to Annex II to the MARPOL Convention, which entered into force on 1 January 2007. As a consequence, and with the entry into force of resolution MEPC.118(52), the reference to Pollutant Categories A, B, C, D and Appendix III have changed to the Pollutant Categories X, Y, Z and OS. The modification of categorization to X, Y, Z or OS means that all AIS units would have to be modified to broadcast the new Pollution Categories. Such a change would need to be carried out by a qualified manufacturer's representative to all of the approximately 80,000 AIS units presently in service aboard ships above 300 gross tonnage.

23.6 The Committee referred document MSC 84/23/1 to the NAV Sub-Committee for consideration under the item on "ITU matters, including Radiocommunication ITU-R Study Group 8 matters" at NAV 54, and instructed the Sub-Committee to report the outcome to MEPC 58 and MSC 85.

## Night-time lookout – photochromic lenses and dark adaptation

23.7 The Committee noted the information provided by the United Kingdom (MSC 84/23/2) on issues affecting night-time lookout, as highlighted during the investigation into the accident involving the sailing yacht **Ouzo** and **Pride of Bilbao** and, invited Member Governments and international organizations to bring the matter to the attention of seafarers. The Committee further authorized the Secretariat to prepare an MSC circular on Night-time lookout – photochromic lenses and dark adaptation and issue it as MSC.1/Circ.1280.

23.8 The observer from ICS informed the Committee that Guidance on blackout requirements on the navigating bridge and the wearing of photochromic lens was included in the fourth edition of the ICS Bridge Procedures Guide.

## Shipping noise and marine mammals

23.9 The Committee noted the information in document MSC 84/INF.4 (United States), advising on the issue of noise generated by international shipping and its potential adverse impact on marine life and referring, in particular, to the facts that the general (low) frequency band of large ships' noise overlaps the frequencies generally produced by some marine animals and that low-frequency sounds from ships travel great distances and are of ever-increasing prevalence, leading to increased concern with regard to potential problems for acoustically-oriented marine animals resulting from noise generated by shipping.

23.10 The Committee, following the request of the United States, invited Member Governments: to inform all interested parties, in particular those from the shipping industry, shipyards and ship builders of this issue; and to invite them to participate in the ongoing dialogue regarding identification of potential adverse impacts associated with vessel noise and the potential mitigation of those impacts and to submit any pertinent information on this issue to the U.S. Department of Commerce, National Oceanic & Atmospheric Administration, National Marine Fisheries Service, Ocean Acoustics Program<sup>\*</sup>.

## **Operational guidance for mooring**

23.11 The Committee noted with appreciation the information provided by ICS, BIMCO, IAPH, IHMA, IMPA and IFSMA (MSC 84/INF.6) on operational guidance for mooring. The need for industry guidance on mooring equipment has been a subject of debate in several IMO bodies, notably at MSC 79, NAV 49 and DE 48.

## **Outcome of the First Seoul International Maritime Forum**

23.12 Having recalled that, at MSC 83, the Republic of Korea had expressed its intention to hold the Seoul International Maritime Forum on a regular basis and had invited the IMO Secretariat and Member States to propose appropriate and relevant topics which may be adopted for the next Seoul Forum, the Committee noted the information provided in document MSC 84/INF.9 (Republic of Korea) on the outcome of the First Seoul International Maritime Forum, which was held in Seoul on 6 and 7 September 2007, under the theme of the Wreck Removal Convention.

## Watchkeeping for small ships and vessels

23.13 The Committee noted the information provided by Denmark (MSC 84/INF.10) on an amendment of the Danish regulation implementing the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended, relating to watchkeeping arrangements for small ships and vessels.

#### **Bulk carrier casualty report**

23.14 The Committee noted the information contained in document MSC 84/INF.12 (INTERCARGO) showing that during 2007, while the dry bulk fleet has been expanding, from 6,046 vessels on 31 December 2006, to 6,342 vessels on 31 December 2007, eight bulk carriers or similar dry bulk vessels were lost – an increase of one on the previous year. A total

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of 39 lives were lost on 2 vessels; compared to the same figure on a total of three vessels in the previous year. The average age of bulk carriers lost in 2007 was 25.5 years against a world wide trading average age of 14.85 years.

23.15 The bulk carrier casualty report indicated that the casualties involved trading routes or management centres outside the three primary trading centres focused on the Paris and Tokyo MoUs and United States Coast Guard spheres of influence. In the context of the loss of two smaller ships engaged on the intra-Asian iron ore trades, the report recommended the analysis of the chartering vetting techniques in this area of occurrence. The report also recommended that some analysis of the evacuation techniques used on the various ships be covered in all accident reports and stressed the need for maximum transparency in the release of accident investigation reports.

## Statement by the delegation of the Cook Islands

23.16 The delegation of the Cook Islands drew the attention of the Committee to the status of the Cook Islands' application for full IMO membership under Article 7 of the IMO Convention, and informed the Committee that the Cook Islands already enjoyed member status at ICAO, IMSO, FAO, UNFCC, WHO, WMO and UNESCO and that only 13 more indications of support from Member States were needed for the Cook Islands to attain the required two-thirds approval of the IMO membership. The delegation of the Cook Islands therefore respectfully requested the delegations of Member States, upon their return to the capitals, to give consideration to conveying their support of the Cook Islands' application to the Secretary-General.

## Incident of m.v. Rezzak

23.17 The delegation of India informed the Committee of the disappearance of m.v. **Rezzak**, which sailed on 17 February 2008 with a full load of steel billets about 5,000 tonnes from Novorossisk (Russia) to Bartin Liman (Turkey) with a crew of 25 (all Indians). Before sailing from Novorossisk, the vessel was reportedly detained for about two weeks due to a large number of deficiencies, and all but a few deficiencies were complied with prior to sailing. Family members of this ill-fated vessel refused to believe that they have lost their near and dear ones. They felt that either the vessel had been hijacked or it could even be a case of fraud. The delegation of India urged that the flag State should submit, at least their interim findings, at the earliest, so that they can inform the next of kin about the fate of the crew. The delegation also requested the flag State to submit the findings in this casualty to MSC 85 so the Committee can be apprised as to why all safety measures failed and what the Committee can do to prevent such terrible losses in future. The delegation of India thanked the coastal State for carrying out SAR operations and the flag State for allowing the participation of their inspector in the casualty investigation, and looked forward to the continued cooperation of the flag State, coastal State and all other parties to get to the bottom of this incident.

23.18 The delegation of Panama shared the concern with the delegation of India as regards the tragedy of the disappearance of m.v. **Rezzak** together with its crew and extended their sentiments to the families of the crew. The delegation said that the Panamanian authority as flag State, being aware of the responsibility of finding the causes of this incident, had undertaken all the work related to the investigation and had been working closely and maintaining constant communication with the Indian Authority, as well as the Turkish Authority as coastal State and with IMO since the incident occurred. The Panamanian delegation informed the Committee that immediately after heartfelt discussions with the delegation of India, they had committed themselves to deliver to the Indian Authority an advance of the initial report of the investigation

of the incident within 10 days. The delegation emphasized the limited information relating to the incident of the ship, and said that Panamanian Authority would continue being in contact with the Indian and Turkish Authorities in order to achieve the requested cooperation in a coordinated manner.

## **Expression of appreciation**

23.19 The Committee expressed appreciation to the following delegates and members of the Secretariat, who had recently retired or were about to, for their invaluable contribution to its work and wished them a long and happy retirement:

- Mr. Yoshio Sasamura (Japan) (on retirement);
- Ms Marja C. Tiemens-Idzinga (Netherlands) (on retirement);
- Mr. Knut Vågnes (Norway) (on retirement);
- Mr. Rune Teisrud (Norway (on retirement);
- Ms F. Dashti (Secretariat) (on retirement);
- Ms Michèle Foré (Secretariat) (on retirement); and
- Mr. Leroy Mayers (Secretariat) (on retirement).

## **Expression of condolences**

23.20 The Committee noted with sadness the sudden death of Mr. Gerard Yoest (United States), a former long-standing delegate to the Council and other IMO bodies, who made an invaluable contribution to the Organization. The Committee requested the delegation of the United States to convey the Committee's condolences and sympathy to the family, friends and colleagues of the deceased who would be thoroughly missed by this Organization.

(The annexes will be issued as addenda to this document)



MARITIME SAFETY COMMITTEE 84th session Agenda item 24 MSC 84/24/Add.1 5 June 2008 Original: ENGLISH

## REPORT OF THE MARITIME SAFETY COMMITTEE ON ITS EIGHTY-FOURTH SESSION

Attached are annexes 1 to 8 to the report of the Maritime Safety Committee on its eighty-fourth session (MSC 84/24).

For reasons of economy, this document is printed in a limited number. Delegates are kindly asked to bring their copies to meetings and not to request additional copies.



## LIST OF ANNEXES

- ANNEX 1 RESOLUTION MSC.255(84) ADOPTION OF THE CODE OF THE INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES FOR A SAFETY INVESTIGATION INTO A MARINE CASUALTY OR MARINE INCIDENT (CASUALTY INVESTIGATION CODE)
- ANNEX 2 RESOLUTION MSC.256(84) ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED
- ANNEX 3 RESOLUTION MSC.257(84) ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED
- ANNEX 4 RESOLUTION MSC.258(84) ADOPTION OF AMENDMENTS TO THE PROTOCOL OF 1988 RELATING TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974
- ANNEX 5 RESOLUTION MSC.259(84) ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 1994 (1994 HSC CODE)
- ANNEX 6 RESOLUTION MSC.260(84) ADOPTION OF AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 2000 (2000 HSC CODE)
- ANNEX 7 RESOLUTION MSC.261(84) ADOPTION OF AMENDMENTS TO THE GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS (RESOLUTION A.744(18), AS AMENDED)
- ANNEX 8 RESOLUTION MSC.262(84) ADOPTION OF AMENDMENTS TO THE INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE

## (See document MSC 84/24/Add.2 for annexes 9 to 11 and 13 to 23 and document MSC 84/24/Add.3 for annex 12)

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#### ANNEX 1

#### RESOLUTION MSC.255(84) (adopted on 16 May 2008)

## ADOPTION OF THE CODE OF THE INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES FOR A SAFETY INVESTIGATION INTO A MARINE CASUALTY OR MARINE INCIDENT (CASUALTY INVESTIGATION CODE)

#### THE MARITIME SAFETY COMMITTEE,

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

NOTING with concern that, despite the best endeavours of the Organization, casualties and incidents resulting in loss of life, loss of ships and pollution of the marine environment continue to occur,

NOTING ALSO that the safety of seafarers and passengers and the protection of the marine environment can be enhanced by timely and accurate reports identifying the circumstances and causes of marine casualties and incidents,

NOTING FURTHER the importance of the United Nations Convention on the Law of the Sea, done at Montego Bay on 10 December 1982, and of the customary international law of the sea,

NOTING IN ADDITION the responsibilities of flag States under the provisions of the International Convention for the Safety of Life at Sea, 1974 (regulation I/21) (hereinafter referred to as "the Convention"), the International Convention on Load Lines, 1966 (article 23) and the International Convention for the Prevention of Pollution from Ships, 1973 (article 12), to conduct casualty investigations and to supply the Organization with relevant findings,

CONSIDERING the need to ensure that all very serious marine casualties are investigated,

CONSIDERING ALSO the Guidelines on fair treatment of seafarers in the event of a maritime accident (resolution A.987(24)),

ACKNOWLEDGING that the investigation and proper analysis of marine casualties and incidents can lead to greater awareness of casualty causation and result in remedial measures, including better training, for the purpose of enhancing safety of life at sea and protection of the marine environment,

RECOGNIZING the need for a code to provide, as far as national laws allow, a standard approach to marine casualty and incident investigation with the objective of preventing marine casualties and incidents in the future,

RECOGNIZING ALSO the international nature of shipping and the need for co-operation between Governments having a substantial interest in a marine casualty or incident for the purpose of determining the circumstances and causes thereof,

NOTING resolution MSC.257(84) by which it adopted amendments to chapter XI-1 of the Convention to make parts I and II of the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident mandatory under the Convention,

HAVING CONSIDERED, at its eighty-fourth session, the text of the proposed Casualty Investigation Code,

1. ADOPTS the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), set out in the Annex to the present resolution;

2. INVITES Contracting Governments to the Convention to note that the Code will take effect on 1 January 2010 upon entry into force of the amendments to regulation XI-1/6 of the Convention;

3. REQUESTS the Secretary-General of the Organization to transmit certified copies of the present resolution and the text of the Code contained in the Annex to all Contracting Governments to the Convention;

4. FURTHER REQUESTS the Secretary-General of the Organization to transmit copies of the present resolution and the text of the Code contained in the Annex to all Members of the Organization which are not Contracting Governments to the Convention.

#### ANNEX

## CODE OF THE INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES FOR A SAFETY INVESTIGATION INTO A MARINE CASUALTY OR MARINE INCIDENT (CASUALTY INVESTIGATION CODE)

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#### Foreword

1 This Code incorporates and builds on the best practices in marine casualty and marine incident investigation that were established by the Code for the Investigation of Marine Casualties and Incidents, adopted in November 1997 by the International Maritime Organization (the Organization), by resolution A.849(20). The Code for the Investigation of Marine Casualties and Incidents sought to promote co-operation and a common approach to marine casualty and marine incident investigations between States.

## Background

2 The Organization has encouraged co-operation and recognition of mutual interest through a number of resolutions. The first was resolution A.173(ES.IV) (Participation in Official Inquiries into Maritime Casualties) adopted in November 1968. Other resolutions followed including: resolution A.322(IX) (The Conduct of Investigations into Casualties) adopted in November 1975; resolution A.440(XI) (Exchange of Information for Investigations into Marine Casualties) and resolution A.442(XI) (Personnel and Material Resource Needs of Administrations for the Investigation of Casualties and the Contravention of Conventions), both adopted in November 1979; resolution A.637(16) (Co-operation in Maritime Casualty Investigations) adopted in 1989.

3 These individual resolutions were amalgamated and expanded by the Organization with the adoption of the Code for the Investigation of Marine Casualties and Incidents. Resolution A.884(21) (Amendments to the Code for the Investigation of Marine Casualties and Incidents resolution A.849(20)), adopted in November 1999, enhanced the Code by providing guidelines for the investigation of human factors.

4 The International Convention for the Safety of Life at Sea (SOLAS), 1948, included a provision requiring flag State Administrations to conduct investigations into any casualty suffered by a ship of its flag if an investigation may assist in identifying regulatory issues as a contributing factor. This provision was retained in the 1960 and 1974 SOLAS Conventions. It was also included in the International Convention on Load Lines, 1966. Further, flag States are required to inquire into certain marine casualties and marine incidents occurring on the high seas<sup>\*</sup>.

5 The sovereignty of a coastal State extends beyond its land and inland waters to the extent of its territorial sea<sup>\*\*</sup>. This jurisdiction gives the coastal State an inherent right to investigate marine casualties and marine incidents connected with its territory. Most national Administrations have legal provisions to cover the investigation of a shipping incident within its inland waters and territorial sea, regardless of the flag.

<sup>\*</sup> Reference is made to the United Nations Convention on the Law of the Sea (UNCLOS), article 94(7) or requirements of international and customary laws.

<sup>\*\*</sup> Reference is made to the United Nations Convention on the Law of the Sea (UNCLOS), article 2 or requirements of international and customary laws.

## Treatment of Seafarers

6 Most recently, the International Labour Organization's Maritime Labour Convention, 2006 (which has not yet come into force), provides a provision for the investigation of some serious marine casualties as well as setting out working conditions for seafarers. Recognizing the need for special protection for seafarers during an investigation, the Organization adopted, in December 2005, the "Guidelines on Fair Treatment of Seafarers in the Event of a Maritime Accident" through resolution A.987(24). The Guidelines were promulgated by the IMO and the ILO on 1 July 2006.

## Adoption of the Code

7 Since the adoption of the first SOLAS Convention, there have been extensive changes in the structure of the international maritime industry and changes in international law. These changes have potentially increased the number of States with an interest in the process and outcomes of marine safety investigations, in the event of a marine casualty or marine incident, increasing the potential for jurisdictional and other procedural differences between affected States.

8 This Code, while it specifies some mandatory requirements, recognizes the variations in international and national laws in relation to the investigation of marine casualties and marine incidents. The Code is designed to facilitate objective marine safety investigations for the benefit of flag States, coastal States, the Organization and the shipping industry in general.

## PART I

## GENERAL PROVISIONS

#### Chapter 1

#### PURPOSE

1.1 The objective of this Code is to provide a common approach for States to adopt in the conduct of marine safety investigations into marine casualties and marine incidents. Marine safety investigations do not seek to apportion blame or determine liability. Instead a marine safety investigation, as defined in this Code, is an investigation conducted with the objective of preventing marine casualties and marine incidents in the future. The Code envisages that this aim will be achieved through States:

- .1 applying consistent methodology and approach, to enable and encourage a broad ranging investigation, where necessary, in the interests of uncovering the causal factors and other safety risks; and
- .2 providing reports to the Organization to enable a wide dissemination of information to assist the international marine industry to address safety issues.

1.2 A marine safety investigation should be separate from, and independent of, any other form of investigation. However, it is not the purpose of this Code to preclude any other form of investigation, including investigations for action in civil, criminal and administrative proceedings. Further, it is not the intent of the Code for a State or States conducting a marine safety investigation to refrain from fully reporting on the causal factors of a marine casualty or marine incident because blame or liability, may be inferred from the findings.

1.3 This Code recognizes that under the Organization's instruments, each flag State has a duty to conduct an investigation into any casualty occurring to any of its ships, when it judges that such an investigation may assist in determining what changes in the present regulations may be desirable, or if such a casualty has produced a major deleterious effect upon the environment. The Code also takes into account that a flag State shall<sup>\*</sup> cause an inquiry to be held, by or before a suitably qualified person or persons into certain marine casualties or marine incidents of navigation on the high seas. However, the Code also recognizes that where a marine casualty or marine incident occurs within the territory, including the territorial sea, of a State, that State has a right<sup>\*\*</sup> to investigate the cause of any such marine casualty or marine incident which might pose a risk to life or to the environment, involve the coastal State's search and rescue authorities, or otherwise affect the coastal State.

<sup>\*</sup> Reference is made to the United Nations Convention on the Law of the Sea (UNCLOS), article 94 or requirements of international and customary laws.

<sup>\*\*</sup> Reference is made to the United Nations Convention on the Law of the Sea (UNCLOS), article 2 or requirements of international and customary laws.

## DEFINITIONS

When the following terms are used in the mandatory standards and recommended practices for marine safety investigations they have the following meaning.

2.1 An *agent* means any person, natural or legal, engaged on behalf of the owner, charterer or operator of a ship, or the owner of the cargo, in providing shipping services, including managing arrangements for the ship being the subject of a marine safety investigation.

2.2 A *causal factor* means actions, omissions, events or conditions, without which:

- .1 the marine casualty or marine incident would not have occurred; or
- .2 adverse consequences associated with the marine casualty or marine incident would probably not have occurred or have been as serious;
- .3 another action, omission, event or condition, associated with an outcome in .1 or .2, would probably not have occurred.

2.3 A *coastal State* means a State in whose territory, including its territorial sea, a marine casualty or marine incident occurs.

2.4 *Exclusive economic zone* means the exclusive economic zone as defined by article 55 of the United Nations Convention on the Law of the Sea.

2.5 *Flag State* means a State whose flag a ship is entitled to fly.

2.6 *High seas* means the high seas as defined in article 86 of the United Nations Convention on the Law of the Sea.

2.7 *Interested party* means an organization, or individual, who, as determined by the marine safety investigating State(s), has significant interests, rights or legitimate expectations with respect to the outcome of a marine safety investigation.

2.8 *International Safety Management (ISM) Code* means the International Management Code for the Safe Operation of Ships and for Pollution Prevention as adopted by the Organization by resolution A.741(18), as amended.

2.9 A *marine casualty* means an event, or a sequence of events, that has resulted in any of the following which has occurred directly in connection with the operations of a ship:

- .1 the death of, or serious injury to, a person;
- .2 the loss of a person from a ship;
- .3 the loss, presumed loss or abandonment of a ship;

- .4 material damage to a ship;
- .5 the stranding or disabling of a ship, or the involvement of a ship in a collision;
- .6 material damage to marine infrastructure external to a ship, that could seriously endanger the safety of the ship, another ship or an individual; or
- .7 severe damage to the environment, or the potential for severe damage to the environment, brought about by the damage of a ship or ships.

However, a marine casualty does not include a deliberate act or omission, with the intention to cause harm to the safety of a ship, an individual or the environment.

2.10 A *marine incident* means an event, or sequence of events, other than a marine casualty, which has occurred directly in connection with the operations of a ship that endangered, or, if not corrected, would endanger the safety of the ship, its occupants or any other person or the environment.

However, a marine incident does not include a deliberate act or omission, with the intention to cause harm to the safety of a ship, an individual or the environment.

2.11 A *marine safety investigation* means an investigation or inquiry (however referred to by a State), into a marine casualty or marine incident, conducted with the objective of preventing marine casualties and marine incidents in the future. The investigation includes the collection of, and analysis of, evidence, the identification of causal factors and the making of safety recommendations as necessary.

- 2.12 A marine safety investigation report means a report that contains:
  - .1 a summary outlining the basic facts of the marine casualty or marine incident and stating whether any deaths, injuries or pollution occurred as a result;
  - .2 the identity of the flag State, owners, operators, the company as identified in the safety management certificate, and the classification society (subject to any national laws concerning privacy);
  - .3 where relevant the details of the dimensions and engines of any ship involved, together with a description of the crew, work routine and other matters, such as time served on the ship;
  - .4 a narrative detailing the circumstances of the marine casualty or marine incident;
  - .5 analysis and comment on the causal factors including any mechanical, human and organizational factors;
  - .6 a discussion of the marine safety investigation's findings, including the identification of safety issues, and the marine safety investigation's conclusions; and

.7 where appropriate, recommendations with a view to preventing future marine casualties and marine incidents.

2.13 *Marine safety investigation Authority* means an Authority in a State, responsible for conducting investigations in accordance with this Code.

2.14 *Marine safety investigating State(s)* means the flag State or, where relevant, the State or States that take the responsibility for the conduct of the marine safety investigation as mutually agreed in accordance with this Code.

2.15 A *marine safety record* means the following types of records collected for a marine safety investigation:

- .1 all statements taken for the purpose of a marine safety investigation;
- .2 all communications between persons pertaining to the operation of the ship;
- .3 all medical or private information regarding persons involved in the marine casualty or marine incident;
- .4 all records of the analysis of information or evidential material acquired in the course of a marine safety investigation;
- .5 information from the voyage data recorder.
- 2.16 A *material damage* in relation to a marine casualty means:
  - .1 damage that:
    - .1.1 significantly affects the structural integrity, performance or operational characteristics of marine infrastructure or a ship; and
    - .1.2 requires major repair or replacement of a major component or components; or
  - .2 destruction of the marine infrastructure or ship.

2.17 A *seafarer* means any person who is employed or engaged or works in any capacity on board a ship.

2.18 A *serious injury* means an injury which is sustained by a person, resulting in incapacitation where the person is unable to function normally for more than 72 hours, commencing within seven days from the date when the injury was suffered.

2.19 A *severe damage to the environment* means damage to the environment which, as evaluated by the State(s) affected, or the flag State, as appropriate, produces a major deleterious effect upon the environment.

#### 2.20 Substantially interested State means a State:

- .1 which is the flag State of a ship involved in a marine casualty or marine incident; or
- .2 which is the coastal State involved in a marine casualty or marine incident; or
- .3 whose environment was severely or significantly damaged by a marine casualty (including the environment of its waters and territories recognized under international law); or
- .4 where the consequences of a marine casualty or marine incident caused, or threatened, serious harm to that State or to artificial islands, installations, or structures over which it is entitled to exercise jurisdiction; or
- .5 where, as a result of a marine casualty, nationals of that State lost their lives or received serious injuries; or
- .6 that has important information at its disposal that the marine safety investigating State(s) consider useful to the investigation; or
- .7 that for some other reason establishes an interest that is considered significant by the marine safety investigating State(s).

2.21 *Territorial sea* means territorial sea as defined by Section 2 of Part II of the United Nations Convention on the Law of the Sea.

2.22 A *very serious marine casualty* means a marine casualty involving the total loss of the ship or a death or severe damage to the environment.

## Chapter 3

## APPLICATION OF CHAPTERS IN PARTS II AND III

3.1 Part II of this Code contains mandatory standards for marine safety investigations. Some clauses apply only in relation to certain categories of marine casualties and are mandatory only for marine safety investigations into those marine casualties.

3.2 Clauses in Part III of this Code may refer to clauses in this part that apply only to certain marine casualties. The clauses in Part III may recommend that such clauses be applied in marine safety investigations into other marine casualties or marine incidents.

#### PART II

#### MANDATORY STANDARDS

#### Chapter 4

#### MARINE SAFETY INVESTIGATION AUTHORITY

4.1 The Government of each State shall provide the Organization with detailed contact information of the marine safety investigation Authority(ies) carrying out marine safety investigations within their State.

#### Chapter 5

#### **NOTIFICATION**

5.1 When a marine casualty occurs on the high seas or in an exclusive economic zone, the flag State of a ship, or ships, involved, shall notify other substantially interested States as soon as is reasonably practicable.

5.2 When a marine casualty occurs within the territory, including the territorial sea, of a coastal State, the flag State, and the coastal State, shall notify each other and between them notify other substantially interested States as soon as is reasonably practicable.

5.3 Notification shall not be delayed due to the lack of complete information.

5.4 **Format and content**: The notification shall contain as much of the following information as is readily available:

- .1 the name of the ship and its flag State;
- .2 the IMO ship identification number;
- .3 the nature of the marine casualty;
- .4 the location of the marine casualty;
- .5 time and date of the marine casualty;
- .6 the number of any seriously injured or killed persons;
- .7 consequences of the marine casualty to individuals, property and the environment; and
- .8 the identification of any other ship involved.

## **REQUIREMENT TO INVESTIGATE VERY SERIOUS MARINE CASUALTIES**

6.1 A marine safety investigation shall be conducted into every very serious marine casualty.

6.2 Subject to any agreement in accordance with chapter 7, the flag State of a ship involved in a very serious marine casualty is responsible for ensuring that a marine safety investigation is conducted and completed in accordance with this Code.

## Chapter 7

## FLAG STATE'S AGREEMENT WITH ANOTHER SUBSTANTIALLY INTERESTED STATE TO CONDUCT A MARINE SAFETY INVESTIGATION

7.1 Without limiting the rights of States to conduct their own separate marine safety investigation, where a marine casualty occurs within the territory, including territorial sea, of a State, the flag State(s) involved in the marine casualty and the coastal State shall consult to seek agreement on which State or States will be the marine safety investigating State(s) in accordance with a requirement, or a recommendation acted upon, to investigate under this Code.

7.2 Without limiting the rights of States to conduct their own separate marine safety investigation, if a marine casualty occurs on the high seas or in the exclusive economic zone of a State, and involves more than one flag State, then the States shall consult to seek agreement on which State or States will be the marine safety investigating State(s) in accordance with a requirement, or a recommendation acted upon, to investigate under this Code.

7.3 For a marine casualty referred to in paragraph 7.1 or 7.2, agreement may be reached by the relevant States with another substantially interested State for that State or States to be the marine safety investigating State(s).

7.4 Prior to reaching an agreement, or if an agreement is not reached, in accordance with paragraph 7.1, 7.2 or 7.3, then the existing obligations and rights of States under this Code, and under other international laws, to conduct a marine safety investigation, remain with the respective parties to conduct their own investigation.

7.5 By fully participating in a marine safety investigation conducted by another substantially interested State, the flag State shall be considered to fulfil its obligations under this Code, SOLAS regulation I/21 and article 94, section 7 of the United Nations Convention on the Law of the Sea.

#### **POWERS OF AN INVESTIGATION**

8.1 All States shall ensure that their national laws provide investigator(s) carrying out a marine safety investigation with the ability to board a ship, interview the master and crew and any other person involved, and acquire evidential material for the purposes of a marine safety investigation.

#### Chapter 9

#### PARALLEL INVESTIGATIONS

9.1 Where the marine safety investigating State(s) is conducting a marine safety investigation under this Code, nothing prejudices the right of another substantially interested State to conduct its own separate marine safety investigation.

9.2 While recognizing that the marine safety investigating State(s) shall be able to fulfil obligations under this Code, the marine safety investigating State(s) and any other substantially interested State conducting a marine safety investigation shall seek to co-ordinate the timing of their investigations, to avoid conflicting demands upon witnesses and access to evidence, where possible.

#### Chapter 10

#### **CO-OPERATION**

10.1 All substantially interested States shall co-operate with the marine safety investigating State(s) to the extent practicable. The marine safety investigating State(s) shall provide for the participation of the substantially interested States to the extent practicable<sup>\*</sup>.

#### Chapter 11

#### INVESTIGATION NOT TO BE SUBJECT TO EXTERNAL DIRECTION

11.1 Marine safety investigating State(s) shall ensure that investigator(s) carrying out a marine safety investigation are impartial and objective. The marine safety investigation shall be able to report on the results of a marine safety investigation without direction or interference from any persons or organizations who may be affected by its outcome.

<sup>\*</sup> The reference to "extent practicable" may be taken to mean, as an example, that co-operation or participation is limited because national laws make it impracticable to fully co-operate or participate.

## **OBTAINING EVIDENCE FROM SEAFARERS**

12.1 Where a marine safety investigation requires a seafarer to provide evidence to it, the evidence shall be taken at the earliest practical opportunity. The seafarer shall be allowed to return to his/her ship, or be repatriated at the earliest possible opportunity. The seafarers human rights shall, at all times, be upheld.

12.2 All seafarers from whom evidence is sought shall be informed of the nature and basis of the marine safety investigation. Further, a seafarer from whom evidence is sought shall be informed, and allowed access to legal advice, regarding:

- .1 any potential risk that they may incriminate themselves in any proceedings subsequent to the marine safety investigation;
- .2 any right not to self-incriminate or to remain silent;
- .3 any protections afforded to the seafarer to prevent the evidence being used against them if they provide the evidence to the marine safety investigation.

## Chapter 13

#### **DRAFT MARINE SAFETY INVESTIGATION REPORTS**

13.1 Subject to paragraphs 13.2 and 13.3, where it is requested, the marine safety investigating State(s) shall send a copy of a draft report to a substantially interested State to allow the substantially interested State to make comment on the draft report.

13.2 Marine safety investigating State(s) are only bound to comply with paragraph 13.1 where the substantially interested State receiving the report guarantees not to circulate, nor cause to circulate, publish or give access to the draft report, or any part thereof, without the express consent of the marine safety investigating State(s) or unless such reports or documents have already been published by the marine safety investigating State(s).

13.3 The marine safety investigating State(s) are not bound to comply with paragraph 13.1 if:

- .1 the marine safety investigating State(s) request that the substantially interested State receiving the report to affirm that evidence included in the draft report will not be admitted in civil or criminal proceedings against a person who gave the evidence; and
- .2 the substantially interested State refuses to provide such an affirmation.

13.4 The marine safety investigating State(s) shall invite the substantially interested States to submit their comments on the draft report within 30 days or some other mutually agreed period. The marine safety investigating State(s) shall consider the comments before preparing the final report and where the acceptance or rejection of the comments will have direct

impact on the interests of the State that submitted them, the marine safety investigating State(s) shall notify the substantially interested State of the manner in which the comments were addressed. If the marine safety investigating State(s) receives no comments after the 30 days or the mutually agreed period has expired, then it may proceed to finalize the report.

13.5 The marine safety investigating State(s) shall seek to fully verify the accuracy and completeness of the draft report by the most practical means.

## Chapter 14

## MARINE SAFETY INVESTIGATION REPORTS

14.1 The marine safety investigating State(s) shall submit the final version of a marine safety investigation report to the Organization for every marine safety investigation conducted into a very serious marine casualty.

14.2 Where a marine safety investigation is conducted into a marine casualty or marine incident, other than a very serious marine casualty, and a marine safety investigation report is produced which contains information which may prevent or lessen the seriousness of marine casualties or marine incidents in the future, the final version shall be submitted to the Organization.

14.3 The marine safety investigation report referred in paragraphs 14.1 and 14.2 shall utilize all the information obtained during a marine safety investigation, taking into account its scope, required to ensure that all the relevant safety issues are included and understood so that safety action can be taken as necessary.

14.4 The final marine safety investigation report shall be made available to the public and the shipping industry by the marine safety investigating State(s), or the marine safety investigating State(s) shall undertake to assist the public and the shipping industry with details, necessary to access the report, where it is published by another State or the Organization.

## PART III

#### **RECOMMENDED PRACTICES**

## Chapter 15

#### ADMINISTRATIVE RESPONSIBILITIES

15.1 States should ensure that marine safety investigating Authorities have available to them sufficient material and financial resources and suitably qualified personnel to enable them to facilitate the State's obligations to undertake marine safety investigations into marine casualties and marine incidents under this Code.

15.2 Any investigator forming part of a marine safety investigation should be appointed on the basis of the skills outlined in resolution A.996(25) for investigators.

15.3 However, paragraph 15.2 does not preclude the appropriate appointment of investigators with necessary specialist skills to form part of a marine safety investigation on a temporary basis, neither does it preclude the use of consultants to provide expert advice on any aspect of a marine safety investigation.

15.4 Any person who is an investigator, in a marine safety investigation, or assisting a marine safety investigation, should be bound to operate in accordance with this Code.

## Chapter 16

## PRINCIPLES OF INVESTIGATION

16.1 **Independence**: A marine safety investigation should be unbiased to ensure the free flow of information to it.

16.1.1 In order to achieve the outcome in paragraph 16.1, the investigator(s) carrying out a marine safety investigation should have functional independence from:

- .1 the parties involved in the marine casualty or marine incident;
- .2 anyone who may make a decision to take administrative or disciplinary action against an individual or organization involved in a marine casualty or marine incident; and
- .3 judicial proceedings.

16.1.2 The investigator(s) carrying out a marine safety investigation should be free of interference from the parties in .1, .2 and .3 of paragraph 16.1.1 with respect to:

- .1 the gathering of all available information relevant to the marine casualty or marine incident, including voyage data recordings and vessel traffic services recordings;
- .2 analysis of evidence and the determination of causal factors;
- .3 drawing conclusions relevant to the causal factors;
- .4 distributing a draft report for comment and preparation of the final report; and
- .5 if appropriate, the making of safety recommendations.

16.2 **Safety focused**: It is not the objective of a marine safety investigation to determine liability, or apportion blame. However, the investigator(s) carrying out a marine safety investigation should not refrain from fully reporting on the causal factors because fault or liability may be inferred from the findings.

16.3 **Co-operation**: Where it is practicable and consistent with the requirements and recommendations of this Code, in particular chapter 10 on Co-operation, the marine safety investigating State(s) should seek to facilitate maximum co-operation between substantially interested States and other persons or organizations conducting an investigation into a marine casualty or marine incident.

16.4 **Priority**: A marine safety investigation should, as far as possible, be afforded the same priority as any other investigation, including investigations by a State for criminal purposes being conducted into the marine casualty or marine incident.

16.4.1 In accordance with paragraph 16.4 investigator(s) carrying out a marine safety investigation should not be prevented from having access to evidence in circumstances where another person or organization is carrying out a separate investigation into a marine casualty or marine incident.

16.4.2 The evidence for which ready access should be provided should include:

- .1 survey and other records held by the flag State, the owners, and classification societies;
- .2 all recorded data, including voyage data recorders; and
- .3 evidence that may be provided by government surveyors, coastguard officers, vessel traffic service operators, pilots or other marine personnel.

16.5 **Scope of a marine safety investigation**: Proper identification of causal factors requires timely and methodical investigation, going far beyond the immediate evidence and looking for underlying conditions, which may be remote from the site of the marine casualty or marine incident, and which may cause other future marine casualties and marine incidents. Marine safety investigations should therefore be seen as a means of identifying not only immediate causal factors but also failures that may be present in the whole chain of responsibility.

## Chapter 17

## INVESTIGATION OF MARINE CASUALTIES (OTHER THAN VERY SERIOUS CASUALTIES) AND MARINE INCIDENTS

17.1 A marine safety investigation should be conducted into marine casualties (other than very serious marine casualties – which are addressed in chapter 6 of this Code) and marine incidents, by the flag State of a ship involved, if it is considered likely that a marine safety investigation will provide information that can be used to prevent marine casualties and marine incidents in the future.

17.2 Chapter 7 contains the mandatory requirements for determining who the marine safety investigating State(s) are for a marine casualty. Where the occurrence being investigated in accordance with this chapter is a marine incident, chapter 7 should be followed as a recommended practice as if it referred to marine incidents.

## FACTORS THAT SHOULD BE TAKEN INTO ACCOUNT WHEN SEEKING AGREEMENT UNDER CHAPTER 7 OF PART II

18.1 When the flag State(s), a coastal State (if involved) or other substantially interested States are seeking to reach agreement, in accordance with chapter 7 of Part II on which State or State(s) will be the marine safety investigating State(s) under this Code, the following factors should be taken into account:

- .1 whether the marine casualty or marine incident occurred in the territory, including territorial sea, of a State;
- .2 whether the ship or ships involved in a marine casualty or marine incident occurring on the high seas, or in the exclusive economic zone, subsequently sail into the territorial sea of a State;
- .3 the resources and commitment required of the flag State and other substantially interested States;
- .4 the potential scope of the marine safety investigation and the ability of the flag State or another substantially interested State to accommodate that scope;
- .5 the need of the investigator(s) carrying out a marine safety investigation to access evidence and consideration of the State or States best placed to facilitate that access to evidence;
- .6 any perceived or actual adverse effects of the marine casualty or marine incident on other States;
- .7 the nationality of the crew, passengers and other persons affected by the marine casualty or marine incident.

## Chapter 19

#### ACTS OF UNLAWFUL INTERFERENCE

19.1 If in the course of a marine safety investigation it becomes known or is suspected that an offence is committed under article 3, *3bis*, *3ter* or *3quarter* of the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation, 1988, the marine safety investigation Authority should immediately seek to ensure that the maritime security Authorities of the State(s) concerned are informed.

## NOTIFICATION TO PARTIES INVOLVED AND COMMENCEMENT OF AN INVESTIGATION

20.1 When a marine safety investigation is commenced under this Code, the master, the owner and agent of a ship involved in the marine casualty or marine incident being investigated, should be informed as soon as practicable of:

- .1 the marine casualty or marine incident under investigation;
- .2 the time and place at which the marine safety investigation will commence;
- .3 the name and contact details of the marine safety investigation Authority(ies);
- .4 the relevant details of the legislation under which the marine safety investigation is being conducted;
- .5 the rights and obligations of the parties subject to the marine safety investigation; and
- .6 the rights and obligations of the State or States conducting the marine safety investigation.

20.2 Each State should develop a standard document detailing the information in paragraph 20.1 that can be transmitted electronically to the master, the agent and the owner of the ship.

20.3 Recognizing that any ship involved in a marine casualty or marine incident may continue in service, and that a ship should not be delayed more than is absolutely necessary, the marine safety investigating State(s) conducting the marine safety investigation should start the marine safety investigation as soon as is reasonably practicable, without delaying the ship unnecessarily.

## Chapter 21

#### **CO-ORDINATING AN INVESTIGATION**

21.1 The recommendations in this chapter should be applied in accordance with the principles in chapters 10 and 11 of this Code.

21.2 The marine safety investigating State(s) should ensure that there is an appropriate framework within the State for:

- .1 the designation of investigators to the marine safety investigation including an investigator to lead the marine safety investigation;
- .2 the provision of a reasonable level of support to members of the marine safety investigation;

- .3 the development of a strategy for the marine safety investigation in liaison with other substantially interested States;
- .4 ensuring the methodology followed during the marine safety investigation is consistent with that recommended in resolution A.884(21), as amended;
- .5 ensuring the marine safety investigation takes into account any recommendations or instruments published by the Organization or International Labour Organization, relevant to conducting a marine safety investigation; and
- .6 ensuring the marine safety investigation takes into account the safety management procedures and the safety policy of the operator of a ship in terms of the ISM Code.

21.3 The marine safety investigating State(s) should allow a substantially interested State to participate in aspects of the marine safety investigation relevant to it, to the extent practicable.

21.3.1 Participation should include allowing representatives of the substantially interested State to:

- .1 interview witnesses;
- .2 view and examine evidence and make copies of documents;
- .3 make submissions in respect of the evidence, comment on and have their views properly reflected in the final report; and
- .4 be provided with the draft and final reports relating to the marine safety investigation<sup>\*</sup>.

21.4 To the extent practical, substantially interested States should assist the marine safety investigating State(s) with access to relevant information for the marine safety investigation. To the extent practical, the investigator(s) carrying out a marine safety investigation should also be afforded access to Government surveyors, coastguard officers, ship traffic service operators, pilots and other marine personnel of a substantially interested State.

21.5 The flag State of a ship involved in a marine casualty or marine incident should help to facilitate the availability of the crew to the investigator(s) carrying out the marine safety investigation.

## Chapter 22

## **COLLECTION OF EVIDENCE**

22.1 A marine safety investigating State(s) should not unnecessarily detain a ship for the collection of evidence from it or have original documents or equipment removed unless this is

<sup>\*</sup> The reference to 'extent practical' may be taken to mean, as an example, that co-operation or participation is limited because national laws make it impractical to fully co-operate or participate.
essential for the purposes of the marine safety investigation. Investigators should make copies of documents where practicable.

22.2 Investigator(s) carrying out a marine safety investigation should secure records of interviews and other evidence collected during a marine safety investigation in a manner which prevents access by persons who do not require it for the purpose of the investigation.

22.3 Investigator(s) carrying out the marine safety investigation should make effective use of all recorded data including voyage data recorders if fitted. Voyage data recorders should be made available for downloading by the investigator(s) carrying out a marine safety investigation or an appointed representative.

22.3.1 In the event that the marine safety investigating State(s) do not have adequate facilities to read a voyage data recorder, States with such a capability should offer their services having due regard to the:

- .1 available resources;
- .2 capabilities of the readout facility;
- .3 timeliness of the readout; and
- .4 location of the facility.

# Chapter 23

## **CONFIDENTIALITY OF INFORMATION**

23.1 States should ensure that investigator(s) carrying out a marine safety investigation only disclose information from a marine safety record where:

- .1 it is necessary or desirable to do so for transport safety purposes and any impact on the future availability of safety information to a marine safety investigation is taken into account; or
- .2 as otherwise permitted in accordance with this Code<sup>\*</sup>.

23.2 States involved in marine safety investigation under this Code should ensure that any marine safety record in its possession is not disclosed in criminal, civil, disciplinary or administrative proceedings unless:

<sup>\*</sup> States recognize that there are merits in keeping information from a marine safety record confidential where it needs to be shared with people outside the marine safety investigation for the purpose of conducting the marine safety investigation. An example is where information from a marine safety record needs to be provided to an external expert for their analysis or second opinion. Confidentiality would seek to ensure that sensitive information is not inappropriately disclosed for purposes other than the marine safety investigation, at a time when it has not been determined how the information will assist in determining the contributing factors in a marine casualty or marine incident. Inappropriate disclosure may infer blame or liability on the parties involved in the marine casualty or marine incident.

- .1 the appropriate authority for the administration of justice in the State determines that any adverse domestic or international impact that the disclosure of the information might have on any current or future marine safety investigations is outweighed by the public interest in the administration of justice; and\*
- .2 where appropriate in the circumstances, the State which provided the marine safety record to the marine safety investigation authorizes its disclosure.

23.3 Marine safety records should be included in the final report, or its appendices, only when pertinent to the analysis of the marine casualty or marine incident. Parts of the record not pertinent, and not included in the final report, should not be disclosed.

23.4 States need only supply information from a marine safety record to a substantially interested State where doing so will not undermine the integrity and credibility of any marine safety investigation being conducted by the State or States providing the information.

23.4.1 The State supplying the information from a marine safety record may require that the State receiving the information undertake to keep it confidential.

# Chapter 24

# PROTECTION FOR WITNESSES AND INVOLVED PARTIES

24.1 If a person is required by law to provide evidence that may incriminate them, for the purposes of a marine safety investigation, the evidence should, so far as national laws allow, be prevented from admission into evidence in civil or criminal proceedings against the individual.

24.2 A person from whom evidence is sought should be informed about the nature and basis of the investigation. A person from whom evidence is sought should be informed, and allowed access to legal advice, regarding:

- .1 any potential risk that they may incriminate themselves in any proceedings subsequent to the marine safety investigation;
- .2 any right not to self-incriminate or to remain silent;
- .3 any protections afforded to the person to prevent the evidence being used against them if they provide the evidence to the marine safety investigation.

<sup>\*</sup> Examples of where it may be appropriate to disclose information from a marine safety record in criminal, civil, disciplinary or administrative proceedings may include:

<sup>1</sup> where a person the subject of the proceedings has engaged in conduct with the intention to cause a destructive result; or

<sup>2</sup> where a person the subject of the proceedings has been aware of a substantial risk that a destructive result will occur and having regard to the circumstances known to him or her it is unjustifiable to take the risk.

# Chapter 25

# DRAFT AND FINAL REPORT

25.1 Marine safety investigation reports from a marine safety investigation should be completed as quickly as practicable.

25.2 Where it is requested, and where practicable, the marine safety investigating State(s) should send a copy of a draft marine safety investigation report for comment to interested parties. However, this recommendation does not apply where there is no guarantee that the interested party will not circulate, nor cause to circulate, publish or give access to the draft marine safety investigation report, or any part thereof, without the express consent of the marine safety investigating State(s).

25.3 The marine safety investigating State(s) should allow the interested party 30 days or some other mutually agreed time to submit their comments on the marine safety investigation report. The marine safety investigating State(s) should consider the comments before preparing the final marine safety investigation report and where the acceptance or rejection of the comments will have direct impact on the interests of the interested party that submitted them, the marine safety investigating State(s) should notify the interested party of the manner in which the comments were addressed. If the marine safety investigating State(s) receives no comments after the 30 days or the mutually agreed period has expired, then it may proceed to finalize the marine safety investigation report.

25.4 Where it is permitted by the national laws of the State preparing the marine safety investigation report, the draft and final report should be prevented from being admissible in evidence in proceedings related to the marine casualty or marine incident that may lead to disciplinary measures, criminal conviction or the determination of civil liability.

25.5 At any stage during a marine safety investigation interim safety measures may be recommended.

25.6 Where a substantially interested State disagrees with the whole or a part of a final marine safety investigation report, it may submit its own report to the Organization.

# Chapter 26

# **RE-OPENING AN INVESTIGATION**

26.1 Marine safety investigating State(s) which have completed a marine safety investigation, should reconsider their findings and consider re-opening the investigation when new evidence is presented which may materially alter the analysis and conclusions reached.

See chapter 13 where provisions with respect to providing interested parties with reports on request may alternatively be included as a mandatory provision.

26.2 When significant new evidence relating to any marine casualty or marine incident is presented to the marine safety investigating State(s) that have completed a marine safety investigation, the evidence should be fully assessed and referred to other substantially interested States for appropriate input.

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## RESOLUTION MSC.256(84) (adopted on 16 May 2008)

# ADOPTION OF 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 FURTHER 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 eighty-fourth 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 2009, 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% 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 2010 upon their acceptance in accordance with paragraph 2 above;

4. RECOMMENDS the Contracting Governments concerned to issue certificates complying with the annexed amendments at the first renewal survey on or after 1 January 2010;

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. FURTHER 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.

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

## CHAPTER II-1 CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

#### **Regulation 3-4 – Emergency towing arrangements on tankers**

1 The existing regulation 3-4 is replaced by the following:

## "Regulation 3-4 Emergency towing arrangements and procedures

#### **1** Emergency towing arrangements on tankers

1.1 Emergency towing arrangements shall be fitted at both ends on board every tanker of not less than 20,000 tonnes deadweight.

- 1.2 For tankers constructed on or after 1 July 2002:
  - .1 the arrangements shall, at all times, be capable of rapid deployment in the absence of main power on the ship to be towed and easy connection to the towing ship. At least one of the emergency towing arrangements shall be pre-rigged ready for rapid deployment; and
  - .2 emergency towing arrangements at both ends shall be of adequate strength taking into account the size and deadweight of the ship, and the expected forces during bad weather conditions. The design and construction and prototype testing of emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization<sup>\*</sup>.

1.3 For tankers constructed before 1 July 2002, the design and construction of emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization<sup>\*</sup>.

## 2 Emergency towing procedures on ships

- 2.1 This paragraph applies to:
  - .1 all passenger ships, not later than 1 January 2010;
  - .2 cargo ships constructed on or after 1 January 2010; and
  - .3 cargo ships constructed before 1 January 2010, not later than 1 January 2012.

2.2 Ships shall be provided with a ship-specific emergency towing procedure. Such a procedure shall be carried aboard the ship for use in emergency situations and shall be based on existing arrangements and equipment available on board the ship.

- 2.3 The procedure<sup>\*\*</sup> shall include:
  - .1 drawings of fore and aft deck showing possible emergency towing arrangements;
  - .2 inventory of equipment on board that can be used for emergency towing;
  - .3 means and methods of communication; and
  - .4 sample procedures to facilitate the preparation for and conducting of emergency towing operations."

2 The following new regulation 3-9 is added after the existing regulation 3-8:

## "Regulation 3-9 Means of embarkation on and disembarkation from ships

1 Ships constructed on or after 1 January 2010 shall be provided with means of embarkation on and disembarkation from ships for use in port and in port related operations, such as gangways and accommodation ladders, in accordance with paragraph 2, unless the Administration deems that compliance with a particular provision is unreasonable or impractical<sup>\*</sup>.

2 The means of embarkation and disembarkation required in paragraph 1 shall be constructed and installed based on the guidelines developed by the Organization<sup>\*\*</sup>.

3 For all ships the means of embarkation and disembarkation shall be inspected and maintained<sup>\*\*</sup> in suitable condition for their intended purpose, taking into account any restrictions related to safe loading. All wires used to support the means of embarkation and disembarkation shall be maintained as specified in regulation III/20.4."

- .1 has small freeboards and is provided with boarding ramps; or
- .2 is engaged in voyages between designated ports where appropriate shore accommodation/embarkation ladders (platforms) are provided.

Refer to the Guidelines on emergency towing arrangements for tankers, adopted by the Maritime Safety Committee by resolution MSC.35(63), as amended.

<sup>&</sup>lt;sup>\*\*</sup> Refer to the Guidelines for owners/operators on preparing emergency towing procedures (MSC.1/Circ.1255).

Circumstances where compliance may be deemed unreasonable or impractical may include where the ship:

<sup>&</sup>lt;sup>\*\*</sup> Refer to the Guidelines for construction, installation, maintenance and inspection/survey of accommodation ladders and gangways, to be developed by the Organization.

## CHAPTER II-2 CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

## **Regulation 10 – Fire fighting**

3 The following new paragraph 4.1.5 is added after the existing paragraph 4.1.4:

"4.1.5 By the first scheduled dry-docking after 1 January 2010, fixed carbon dioxide fire-extinguishing systems for the protection of machinery spaces and cargo pump-rooms on ships constructed before 1 July 2002 shall comply with the provisions of paragraph 2.2.2 of chapter 5 of the Fire Safety Systems Code."

## **Regulation 19 – Carriage of dangerous goods**

4 In paragraph 4, the words ", as defined in regulation VII/2," are deleted.

## **Regulation 20 – Protection of vehicle, special category and ro-ro spaces**

5 The existing paragraph 6.1.4 is replaced by the following paragraph 6.1.4 and new paragraph 6.1.5 is added after paragraph 6.1.4 as follows:

"6.1.4 The requirement of this paragraph shall apply to ships constructed on or after 1 January 2010. Ships constructed on or after 1 July 2002 and before 1 January 2010 shall comply with the previously applicable requirements of paragraph 6.1.4, as amended by resolution MSC.99(73). When fixed pressure water-spraying systems are fitted, in view of the serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks during the operation of the fixed pressure water-spraying system, the following arrangements shall be provided:

- .1 in passenger ships:
- .1.1 in the spaces above the bulkhead deck, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard, taking into account the guidelines developed by the Organization<sup>\*</sup>;
- .1.2.1 in ro-ro passenger ships, discharge valves for scuppers, fitted with positive means of closing operable from a position above the bulkhead deck in accordance with the requirements of the International Convention on Load Lines in force, shall be kept open while the ships are at sea;
- .1.2.2 any operation of valves referred to in paragraph 6.1.4.1.2.1 shall be recorded in the log-book;
- .1.3 in the spaces below the bulkhead deck, the Administration may require pumping and drainage facilities to be provided additional to the requirements of regulation II-1/35-1. In such case, the drainage system shall be sized to remove no less than 125% of the combined capacity

of both the water-spraying system pumps and the required number of fire hose nozzles, taking into account the guidelines developed by the Organization<sup>\*</sup>. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment;

.2 in cargo ships, the drainage and pumping arrangements shall be such as to prevent the build-up of free surfaces. In such case, the drainage system shall be sized to remove no less than 125% of the combined capacity of both the water-spraying system pumps and the required number of fire hose nozzles, taking into account the guidelines developed by the Organization<sup>\*</sup>. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. Bilge wells shall be of sufficient holding capacity and shall be arranged at the side shell of the ship at a distance from each other of not more than 40 m in each watertight compartment. If this is not possible, the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the Administration in its approval of the stability information<sup>\*\*</sup>. Such information shall be included in the stability information supplied to the master as required by regulation II-1/5-1.

6.1.5 On all ships, for closed vehicles and ro-ro spaces and special category spaces, where fixed pressure water-spraying systems are fitted, means shall be provided to prevent the blockage of drainage arrangements, taking into account the guidelines developed by the Organization<sup>\*</sup>. Ships constructed before 1 January 2010 shall comply with the requirements of this paragraph by the first survey after 1 January 2010."

# CHAPTER III LIFE-SAVING APPLIANCES AND ARRANGEMENTS

# **Regulation 6 – Communications**

6 The existing paragraph 2.2 is replaced by the following:

# **"2.2 Search and rescue locating devices**

At least one search and rescue locating device shall be carried on each side of every passenger ship and of every cargo ship of 500 gross tonnage and upwards. At least one search and rescue locating device shall be carried on every cargo ship of 300 gross

Refer to the Guidelines for drainage systems in closed vehicle and ro-ro spaces and special category spaces, to be developed by the Organization.

<sup>\*</sup> Refer to the Recommendation on fixed fire-extinguishing systems for special category spaces, adopted by the Organization by resolution A.123(V).

tonnage and upwards but less than 500 gross tonnage. Such search and rescue locating devices shall conform to the applicable performance standards not inferior to those adopted by the Organization<sup>\*</sup>. The search and rescue locating devices<sup>\*\*</sup> shall be stowed in such location that they can be rapidly placed in any survival craft other than the liferaft or liferafts required by regulation 31.1.4. Alternatively one search and rescue locating devices and evice shall be stowed in each survival craft other than those required by regulation 31.1.4. On ships carrying at least two search and rescue locating devices and equipped with free-fall lifeboats one of the search and rescue locating devices shall be stowed in a free-fall lifeboat and the other located in the immediate vicinity of the navigation bridge so that it can be utilized on board and ready for transfer to any of the other survival craft."

## **Regulation 26 – Additional requirements for ro-ro passenger ships**

7 The existing paragraph 2.5 is replaced by the following:

"2.5 Liferafts carried on ro-ro passenger ships shall be fitted with a search and rescue locating device in the ratio of one search and rescue locating device for every four liferafts. The search and rescue locating device shall be mounted inside the liferaft so its antenna is more than one metre above the sea level when the liferaft is deployed, except that for canopied reversible liferafts the search and rescue locating device shall be so arranged as to be readily accessed and erected by survivors. Each search and rescue locating device shall be arranged to be manually erected when the liferaft is deployed. Containers of liferafts fitted with search and rescue locating devices shall be clearly marked."

# CHAPTER IV RADIOCOMMUNICATIONS

## **Regulation 7 – Radio equipment: General**

- 8 In paragraph 1, subparagraph .3 is replaced by the following:
  - ".3 a search and rescue locating device capable of operating either in the 9 GHz band or on frequencies dedicated for AIS, which:"

<sup>&</sup>lt;sup>\*</sup> Refer to the Recommendation on performance standards for survival craft radar transponders for use in search and rescue operations, adopted by the Organization by resolution MSC.247(83) (A.802(19)), as amended) and the Recommendation on performance standards for survival craft AIS Search and Rescue transmitter (AIS SART), adopted by the Organization by resolution MSC.246(83).

<sup>\*\*</sup> One of these search and rescue locating devices may be the search and rescue locating device required by regulation IV/7.1.3.

# APPENDIX CERTIFICATES

## **Record of Equipment for Passenger Ship Safety Certificate (Form P)**

9 In the Record of Equipment for Passenger Ship Safety Certificate (Form P), in section 2, the existing item 11.1 is replaced by the following:

- "11.1 Number of search and rescue locating devices
- 11.1.1 Radar search and rescue transponders (SART)
- 11.1.2 AIS search and rescue transmitters (AIS-SART)",

and in section 3, the existing item 6 is replaced by the following:

- "6 Ship's search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)".

## **Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E)**

10 In the Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E), in section 2, the existing item 9.1 is replaced by the following:

- "9.1 Number of search and rescue locating devices
- 9.1.1 Radar search and rescue transponders (SART)
- 9.1.2 AIS search and rescue transmitters (AIS-SART)".

## **Record of Equipment for Cargo Ship Radio Certificate (Form R)**

11 In the Record of Equipment for Cargo Ship Safety Radio Certificate (Form R), in section 2, the existing item 6 is replaced by the following:

- "6 Ship's search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)".

## **Record of Equipment for the Nuclear Passenger Ship Safety Certificate (Form PNUC)**

12 In the Record of Equipment for Nuclear Passenger Ship Safety Certificate (Form PNUC), in section 2, the existing item 11.1 is replaced by the following:

- "11.1 Number of search and rescue locating devices
- 11.1.1 Radar search and rescue transponders (SART)
- 11.1.2 AIS search and rescue transmitters (AIS-SART)",

and in section 3, the existing item 6 is replaced by the following:

- "6 Ship's search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)".

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## **Record of Equipment for the Nuclear Cargo Ship Safety Certificate (Form CNUC)**

13 In the Record of Equipment for Nuclear Cargo Ship Safety Certificate (Form CNUC), in section 2, item 9 is deleted and items 10, 10.1 and 10.2 are renumbered as items 9, 9.1 and 9.2 respectively; and the renumbered item 9.1 is replaced by the following:

- "9.1 Number of search and rescue locating devices
- 9.1.1 Radar search and rescue transponders (SART)
- 9.1.2 AIS search and rescue transmitters (AIS-SART)",

and in section 3, the existing item 6 is replaced by the following:

- "6 Ship's search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)".

\*\*\*

## RESOLUTION MSC.257(84) (adopted on 16 May 2008)

## ADOPTION OF 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 FURTHER 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 eighty-fourth 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 2009, 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% 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 2010 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. FURTHER 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.

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

## CHAPTER XI-1 SPECIAL MEASURES TO ENHANCE MARITIME SAFETY

1 The following new regulation 6 is added after the existing regulation 5:

## "Regulation 6 Additional requirements for the investigation of marine casualties and incidents

Taking into account regulation I/21, each Administration shall conduct investigations of marine casualties and incidents, in accordance with the provisions of the present Convention, as supplemented by the provisions of the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code) adopted by resolution MSC.255(84), and:

- .1 the provisions of parts I and II of the Casualty Investigation Code shall be fully complied with;
- .2 the related guidance and explanatory material contained in part III of the Casualty Investigation Code should be taken into account to the greatest possible extent in order to achieve a more uniform implementation of the Casualty Investigation Code;
- .3 amendments to parts I and II of the Casualty Investigation Code shall be adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I; and
- .4 part III of the Casualty Investigation Code shall be amended by the Maritime Safety Committee in accordance with its rules of procedure."

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## RESOLUTION MSC.258(84) (adopted on 16 May 2008)

## ADOPTION OF AMENDMENTS TO THE PROTOCOL OF 1988 RELATING TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

## THE MARITIME SAFETY COMMITTEE,

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

RECALLING FURTHER article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention") and article VI of the Protocol of 1988 relating to the Convention (hereinafter referred to as "the 1988 SOLAS Protocol") concerning the procedure for amending the 1988 SOLAS Protocol,

HAVING CONSIDERED, at its eighty-fourth session, amendments to the 1988 SOLAS Protocol proposed and circulated in accordance with article VIII(b)(i) of the Convention and article VI of the 1988 SOLAS Protocol,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention and article VI of the 1988 SOLAS Protocol, amendments to the appendix to the Annex to the 1988 SOLAS Protocol, 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 and article VI of the 1988 SOLAS Protocol, that the said amendments shall be deemed to have been accepted on 1 July 2009, unless, prior to that date, more than one third of the Parties to the 1988 SOLAS Protocol or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES the Parties concerned to note that, in accordance with article VIII(b)(vii)(2) of the Convention and article VI of the 1988 SOLAS Protocol, the amendments shall enter into force on 1 January 2010, upon their acceptance in accordance with paragraph 2 above;

4. RECOMMENDS the Parties concerned to issue certificates complying with the annexed amendments at the first renewal survey on or after 1 January 2010;

5. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention and article VI of the 1988 SOLAS 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 SOLAS Protocol;

6. FURTHER 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 SOLAS Protocol.

# AMENDMENTS TO THE PROTOCOL OF 1988 RELATING TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

## ANNEX

# MODIFICATIONS AND ADDITIONS TO THE ANNEX TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

#### APPENDIX

# MODIFICATIONS AND ADDITIONS TO THE APPENDIX TO THE ANNEX TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

#### **Record of Equipment for Passenger Ship Safety Certificate (Form P)**

1 In the Record of Equipment for Passenger Ship Safety Certificate (Form P), in section 2, the existing item 11.1 is replaced by the following:

- "11.1 Number of search and rescue locating devices
- 11.1.1 Radar search and rescue transponders (SART)
- 11.1.2 AIS search and rescue transmitters (AIS-SART)",

and in section 3, the existing item 6 is replaced by the following:

- "6 Ship's search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)".

## **Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E)**

2 In the Record of Equipment for Cargo Ship Safety Equipment Certificate (Form E), in section 2, the existing item 9.1 is replaced by the following:

- "9.1 Number of search and rescue locating devices
- 9.1.1 Radar search and rescue transponders (SART)
- 9.1.2 AIS search and rescue transmitters (AIS-SART)".

## **Record of Equipment for Cargo Ship Radio Certificate (Form R)**

3 In the Record of Equipment for Cargo Ship Safety Radio Certificate (Form R), in section 2, the existing item 6 is replaced by the following:

- "6 Ship's search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)".

## **Record of Equipment for the Cargo Ship Safety Certificate (Form C)**

4 In the Record of Equipment for Cargo Ship Safety Certificate (Form C), in section 2, the existing item 9.1 is replaced by the following:

- "9.1 Number of search and rescue locating devices
- 9.1.1 Radar search and rescue transponders (SART)
- 9.1.2 AIS search and rescue transmitters (AIS-SART)",

and in section 3, the existing item 6 is replaced by the following:

- "6 Ship's search and rescue locating device
- 6.1 Radar search and rescue transponder (SART)
- 6.2 AIS search and rescue transmitter (AIS-SART)".

\*\*\*

## RESOLUTION MSC.259(84) (adopted on 16 May 2008)

# ADOPTION OF 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, 1994 (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 eighty-fourth 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 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 2009 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% 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 2010 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. FURTHER 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.

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

#### CHAPTER 8 LIFE-SAVING APPLIANCES AND ARRANGEMENTS

## 8.2 Communications

- 1 In paragraph 8.2.1, subparagraph .2 is replaced by the following:
  - ".2 at least one search and rescue locating device shall be carried on each side of every passenger high-speed craft and every cargo high-speed craft of 500 gross tonnage and upwards. Such search and rescue locating device should conform to the applicable performance standards not inferior to those adopted by the Organization<sup>\*</sup>. The search and rescue locating device should be stowed in such locations that they can be rapidly placed in any one of the liferafts. Alternatively, one search and rescue locating device should be stowed in each survival craft."

#### CHAPTER 14 RADIOCOMMUNICATIONS

#### 14.6 Radio equipment: General

- 2 In paragraph 14.6.1, subparagraph .3 is replaced by the following:
  - ".3 a search and rescue locating device which:"

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Refer to the Recommendation on performance standards for survival craft radar transponders for use in search and rescue operations, adopted by the Organization by resolution MSC.247(83) (A.802(19)), as amended) and the Recommendation on performance standards for survival craft AIS search and rescue transmitter (AIS SART), adopted by the Organization by resolution MSC.246(83).

#### RESOLUTION MSC.260(84) (adopted on 16 May 2008)

# ADOPTION OF 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 eighty-fourth 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 2009 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% 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 2010 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. FURTHER 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.

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

#### CHAPTER 8 LIFE-SAVING APPLIANCES AND ARRANGEMENTS

#### 8.2 Communications

- 1 In paragraph 8.2.1, subparagraph .2 is replaced by the following:
  - ".2 at least one search and rescue locating device shall be carried on each side of every passenger high-speed craft and every cargo high-speed craft of 500 gross tonnage and upwards. Such search and rescue locating device shall conform to the applicable performance standards not inferior to those adopted by the Organization<sup>\*</sup>. The search and rescue locating device shall be stowed in such locations that they can be rapidly placed in any one of the liferafts. Alternatively, one search and rescue locating device shall be stowed in each survival craft."

## CHAPTER 14 RADIOCOMMUNICATIONS

#### 14.7 Radio equipment: General

- 2 In paragraph 14.7.1, subparagraph .3 is replaced by the following:
  - ".3 a search and rescue locating device which:"

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Refer to the Recommendation on performance standards for survival craft radar transponders for use in search and rescue operations, adopted by the Organization by resolution MSC.247(83) (A.802(19)), as amended) and the Recommendation on performance standards for survival craft AIS search and rescue transmitter (AIS SART), adopted by the Organization by resolution MSC.246(83).

## RESOLUTION MSC.261(84) (adopted on 16 May 2008)

## ADOPTION OF AMENDMENTS TO THE GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS (RESOLUTION A.744(18), 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 resolution A.744(18) by which the Assembly adopted the Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers (the Guidelines),

RECALLING FURTHER article VIII(b) and regulation XI-1/2 of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as "the Convention") concerning the procedure for amending the Guidelines,

NOTING that the Assembly, when adopting resolution A.744(18), requested the Maritime Safety Committee and the Marine Environment Protection Committee to keep the Guidelines under review and update them as necessary, in the light of experience gained in their application,

NOTING ALSO resolutions MSC.49(66), MSC.105(73), MSC.125(75), MSC.144(77), MSC.197(80) and resolution 2 of the 1997 Conference of Contracting Governments to the Convention, by which amendments to the Guidelines were adopted by the Maritime Safety Committee and the Conference of Contracting Governments to the Convention, in accordance with article VIII(b) and regulation XI/2 of the Convention,

HAVING CONSIDERED, at its eighty-fourth session, amendments to the Guidelines 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 Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers, 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 2009, 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% 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 2010 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. FURTHER 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.

## AMENDMENTS TO THE GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS (RESOLUTION A.744(18)), AS AMENDED

#### Contents

1 After the existing title of "ANNEX A" the following new title is inserted:

#### "Part A

## GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS HAVING SINGLE-SIDE SKIN CONSTRUCTION"

2 After the existing list of contents for "ANNEX A", the following is inserted:

#### "Part B

## GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS HAVING DOUBLE-SIDE SKIN CONSTRUCTION

## 1 General

- 1.1 Application
- 1.2 Definitions
- 1.3 Repairs
- 1.4 Surveyors

## 2 Renewal survey

- 2.1 General
- 2.2 Dry-dock survey
- 2.3 Space protection
- 2.4 Hatch covers and coamings
- 2.5 Extent of overall and close-up surveys
- 2.6 Extent of thickness measurements
- 2.7 Extent of tank pressure testing

# 3 Annual survey

- 3.1 General
- 3.2 Examination of the hull
- 3.3 Examination of hatch covers and coamings
- 3.4 Examination of cargo holds
- 3.5 Examination of ballast tanks

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## 4 Intermediate survey

- 4.1 General
- 4.2 Bulk carriers 5 to 10 years of age
- 4.3 Bulk carriers 10 to 15 years of age
- 4.4 Bulk carriers exceeding 15 years of age

## 5 **Preparations for survey**

- 5.1 Survey programme
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- 5.3 Access to structures
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## 6 **Documentation on board**

- 6.1 General
- 6.2 Survey report file
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- 7.2 Certification of thickness measurement company
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## 8 **Reporting and evaluation of survey**

- 8.1 Evaluation of survey report
- 8.2 Reporting
- Annex 1 Requirements for close-up survey at renewal surveys
- Annex 2 Requirements for thickness measurements at renewal surveys
- Annex 3 Owner's inspection report
- Annex 4A Survey programme
- Annex 4B Survey planning questionnaire
- Annex 5 Procedures for certification of a company engaged in thickness measurement of hull structures

## Annex 6 Survey reporting principles

- Annex 7 Condition evaluation report
- Annex 8 Recommended procedures for thickness measurements
- Annex 9 Guidelines for technical assessment in conjunction with planning for enhanced surveys of bulk carriers relevant survey
- Annex 10 Requirements for extent of thickness measurements at those areas of substantial corrosion of bulk carriers with double-side skin construction within the cargo length area
- Annex 11 Strength of cargo hatch cover securing arrangements for bulk carriers
- Annex 12 Procedural requirements for thickness measurements"

## ANNEX A

## GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS

3 After the above title, the following is inserted:

#### "Part A

## GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS HAVING SINGLE-SIDE SKIN CONSTRUCTION"

#### 1.1 Application

4 The existing text of paragraph 1.1.1 is replaced by the following:

"1.1.1 The Guidelines should apply to all self-propelled bulk carriers of 500 gross tonnage and above having single-side skin construction. Where a bulk carrier has a combination of single- and double-side skin construction, the relevant requirements of parts A and B should apply to that construction, as applicable."

5 The following new part B is inserted after part A:

## "Part B

# GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS HAVING DOUBLE-SIDE SKIN CONSTRUCTION

# 1 General

# 1.1 Application<sup>\*</sup>

**1.1.1** The Guidelines should apply to all self-propelled bulk carriers of 500 gross tonnage and above having double-side skin construction. Where a bulk carrier has a combination of single- and double-side skin construction, the relevant requirements of parts A and B should apply to that construction, as applicable.

**1.1.2** The Guidelines should apply to surveys of hull structure and piping systems in way of cargo holds, cofferdams, pipe tunnels, void spaces within the cargo length area and all ballast tanks. The surveys should be carried out during the surveys prescribed by regulation I/10 of the Convention.

**1.1.3** The Guidelines contain the extent of examination, thickness measurements and tank testing. The survey should be extended when substantial corrosion and/or structural defects are found and include additional close-up survey when necessary.

# 1.2 Definitions

**1.2.1** *Bulk carrier* is a ship which is constructed generally with single deck, topside tanks and hopper side tanks in cargo spaces, and is intended primarily to carry dry cargo in bulk and includes such types as ore carriers and combination carriers.

**1.2.2** *Ballast tank* is a tank which is used for water ballast and includes side ballast tanks, ballast double bottom spaces, topside tanks, hopper side tanks and peak tanks. A double-side tank should be considered, for survey purposes, as a separate tank even if it is in connection to either the topside tank or the hopper side tank.

**1.2.3** *Spaces* are separate compartments including holds and tanks.

**1.2.4** *Overall survey* is a survey intended to report on the overall condition of the hull structure and determine the extent of additional close-up surveys.

<sup>\*</sup> The intention of these Guidelines is to ensure that an appropriate level of review of plans and documents is conducted and consistency in application is attained. Such evaluation of survey reports, survey programmes, planning documents, etc., should be carried out at the managerial level of the Administration or organization recognized by the Administration.

<sup>&</sup>lt;sup>\*\*</sup> For combination carriers, additional requirements are specified in the Guidelines on the enhanced programme of inspections during surveys for oil tankers, set out in Annex B.

**1.2.5** *Close-up survey* is a survey where the details of structural components are within the close visual inspection range of the surveyor, i.e., preferably within reach of hand.

**1.2.6** *Transverse section* includes all longitudinal members such as plating, longitudinals and girders at the deck, sides, bottom, inner bottom, hopper sides, inner sides, top wing inner sides and longitudinal bulkheads.

**1.2.7** *Representative spaces* are those which are expected to reflect the condition of other spaces of similar type and service and with similar corrosion prevention systems. When selecting representative spaces, account should be taken of the service and repair history on board and identifiable critical and/or suspect areas.

**1.2.8** *Suspect areas* are locations showing substantial corrosion and/or are considered by the surveyor to be prone to rapid wastage.

**1.2.9** Substantial corrosion is an extent of corrosion such that assessment of corrosion pattern indicates a wastage in excess of 75% of allowable margins, but within acceptable limits.

**1.2.10** A *corrosion prevention system* is normally considered a full hard coating.

Protective coating should usually be epoxy coating or equivalent. Other coating systems may be considered acceptable as alternatives provided that they are applied and maintained in compliance with the manufacturer's specifications.

Where soft coatings have been applied, safe access should be provided for the surveyor to verify the effectiveness of the coating and to carry out an assessment of the conditions of internal structures which may include spot removal of the coating. When safe access cannot be provided, the soft coating should be removed.

**1.2.11** *Coating condition* is defined as follows:

GOOD condition with only minor spot rusting;

- FAIR condition with local breakdown of coating at edges of stiffeners and weld connections and/or light rusting over 20% or more of areas under consideration, but less than as defined for POOR condition;
- POOR condition with general breakdown of coating over 20% or more of areas or hard scale at 10% or more of areas under consideration.

**1.2.12** *Critical structural areas* are locations which have been identified from calculations to require monitoring or from the service history of the subject ship or from similar or sister ships to be sensitive to cracking, buckling or corrosion which would impair the structural integrity of the ship.

**1.2.13** *Cargo length area* is that part of the ship which includes all cargo holds and adjacent areas including fuel tanks, cofferdams, ballast tanks and void spaces.

**1.2.14** *Intermediate survey* is a survey carried out either at the second or third annual survey or between these surveys.

**1.2.15** A *prompt and thorough repair* is a permanent repair completed at the time of survey to the satisfaction of the surveyor, therein removing the need for the imposition of any associated condition of classification or recommendation.

**1.2.16** *Convention* means the International Convention for the Safety of Life at Sea, 1974, as amended.

**1.2.17** *Specially considered* means sufficient close-up inspection and thickness measurements are taken to confirm the actual average condition of the structure under coating.

# 1.3 Repairs

**1.3.1** Any damage in association with wastage over the allowable limits (including buckling, grooving, detachment or fracture), or extensive areas of wastage over the allowable limits, which affects or, in the opinion of the Administration, will affect the ship's structural, watertight or weathertight integrity, should be promptly and thoroughly repaired. Areas which should be considered include:

- .1 side shell frames, their end attachments or adjacent shell plating;
- .2 deck structure and deck plating;
- .3 bottom structure and bottom plating;
- .4 watertight or oiltight bulkheads; and
- .5 hatch covers or hatch coamings.

Where adequate repair facilities are not available, the Administration may allow the ship to proceed directly to a repair facility. This may require discharging the cargo and/or temporary repairs for the intended voyage.

**1.3.2** Additionally, when a survey results in the identification of corrosion or structural defects, either of which, in the opinion of the Administration, will impair the ship's fitness for continued service, remedial measures should be implemented before the ship continues in service.

# 1.4 Surveyors

For bulk carriers of 20,000 tons deadweight and above, two surveyors should jointly carry out the first scheduled renewal survey after the bulk carrier passes 10 years of age, and all subsequent renewal surveys and intermediate surveys. If the surveys are carried out by a recognized organization, the surveyors should be exclusively employed by such recognized organizations.

# 2 Renewal survey

# 2.1 General

**2.1.1** The renewal survey may be commenced at the fourth annual survey and be progressed during the succeeding year with a view to completion by the fifth anniversary date.

**2.1.2** As part of the preparation for the renewal survey, the survey programme should be dealt with in advance of the survey. The thickness measurement should not be held before the fourth annual survey.

**2.1.3** The survey should include, in addition to the requirements of the annual survey, examination, tests and checks of sufficient extent to ensure that the hull and related piping is in a satisfactory condition and is fit for its intended purpose for the new period of validity of the Cargo Ship Safety Construction Certificate, subject to proper maintenance and operation and to renewal surveys being carried out.

**2.1.4** All cargo holds, ballast tanks, including double bottom and double-side tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull should be examined, and this examination should be supplemented by thickness measurement and testing, as required by 2.6 and 2.7, to ensure that the structural integrity remains effective. The examination should be sufficient to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration.

**2.1.5** All piping systems within the above spaces should be examined and operationally tested under working conditions to ensure that the condition remains satisfactory.

**2.1.6** The survey extent of ballast tanks converted to void spaces should be specially considered in relation to the requirements for ballast tanks.

# 2.2 Dry-dock survey

**2.2.1** A survey in dry dock should be a part of the renewal survey. There should be a minimum of two inspections of the outside of the ship's bottom during the five-year period of the certificate. In all cases, the maximum interval between bottom inspections should not exceed 36 months.

**2.2.2** For ships of 15 years of age and over, inspection of the outside of the ship's bottom should be carried out with the ship in dry dock. For ships of less than 15 years of age, alternate inspections of the ship's bottom not conducted in conjunction with the renewal survey may be carried out with the ship afloat. Inspection of the ship afloat should only be carried out when the conditions are satisfactory and the proper equipment and suitably qualified staff are available.

**2.2.3** If a survey in dry-dock is not completed in conjunction with the enhanced survey during renewal survey or if the 36 month maximum interval referred to in 2.2.1 is not complied with, the Cargo Ship Safety Construction Certificate should cease to be valid until a survey in dry-dock is completed.

## 2.3 Space protection

Where provided, the condition of the corrosion prevention system of ballast tanks should be examined. For ballast tanks, excluding double bottom tanks, where a coating is found in POOR condition as defined in 1.2.11, and it is not renewed, or where a soft coating has been applied, or where a coating has not been applied, the tanks in question should be examined at annual intervals. When such breakdown of coating is found in ballast double bottom tanks, or where a soft coating has been applied or where a coating has not been applied, the tanks in question may be examined at annual intervals. When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurement should be carried out. Where a protective coating is provided in cargo holds and is found in good condition, the extent of close-up surveys and thickness measurements may be specially considered.

# 2.4 Hatch covers and coamings

**2.4.1** A thorough inspection of the items listed in 3.3 should be carried out.

**2.4.2** Checking of the satisfactory operation of all mechanically operated hatch covers should be made, including:

- .1 stowage and securing in open condition;
- .2 proper fit and efficiency of sealing in closed condition;
- .3 operational testing of hydraulic and power components, wires, chains and link drives.

**2.4.3** The effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent should be checked.

**2.4.4** Thickness measurement of the hatch cover and coaming plating and stiffeners should be carried out as given in annex 2.

## 2.5 Extent of overall and close-up surveys

**2.5.1** An overall survey of all spaces excluding fuel oil tanks should be carried out at the renewal survey. Fuel oil tanks in way of cargo holds should be sufficiently examined to ensure that their condition is satisfactory.

**2.5.2** Each renewal survey should include a close-up examination of sufficient extent to establish the condition of the cargo holds and ballast tanks as indicated in annex 1.

## 2.6 Extent of thickness measurements

**2.6.1** The requirements for thickness measurements at the renewal survey are given in annex 2.

**2.6.2** Representative thickness measurements to determine both general and local levels of corrosion in the transverse web frames in all water ballast tanks should be carried out. Thickness measurements should also be carried out to determine the corrosion levels on the transverse bulkhead plating. The thickness measurements may be dispensed with provided the surveyor is satisfied by the close-up examination that there is no structural diminution, and the coating where applied remains efficient.

**2.6.3** The surveyor may extend the thickness measurements as deemed necessary. Provisions for extended measurements for areas with substantial corrosion as defined in 1.2.9 are given in annex 10.

**2.6.4** For areas in spaces where coatings are found to be in GOOD condition as defined in 1.2.11, the extent of thickness measurements according to annex 2 may be specially considered by the Administration. Where a protective coating is provided in cargo holds and is found in good condition, the extent of close-up surveys and thickness measurements may be specially considered.

**2.6.5** Transverse sections should be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements.

# 2.7 Extent of tank pressure testing

**2.7.1** All boundaries of ballast tanks, deep tanks and cargo holds used for ballast within the cargo hold length should be pressure tested. Representative tanks for fresh water, fuel oil and lubrication oil should also be pressure tested.

**2.7.2** Generally, the hydrostatic pressure should correspond to a water level to the top of hatches for ballast/cargo holds, or top of air pipes for ballast tanks or fuel tanks.

# 3 Annual survey

# 3.1 General

The annual survey should consist of an examination for the purpose of ensuring, as far as practicable, that the hull hatch covers, coamings and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file.

# **3.2** Examination of the hull

**3.2.1** Examination of the hull plating and its closing appliances should be carried out as far as can be seen.

**3.2.2** Examination of watertight penetrations should be carried out as far as practicable.

# **3.3** Examination of hatch covers and coamings

**3.3.1** It should be confirmed that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since the last survey.

**3.3.2** A thorough survey of cargo hatch covers and coamings is only possible by examination in the open as well as closed positions and should include verification of proper opening and closing operation. As a result, at least the hatch covers sets within the forward 25% of the ship's length and at least one additional set, such that all the sets on the ship are assessed at least once in every 5-year period, should be surveyed open, closed and in operation to the full extent in each direction at each annual survey, including:

- .1 stowage and securing in open condition;
- .2 proper fit and efficiency of sealing in closed condition; and
- .3 operational testing of hydraulic and power components, wires, chains and link drives.

The closing of the covers should include the fastening of all peripheral, and cross joint cleats or other securing devices. Particular attention should be paid to the condition of hatch covers in the forward 25% of the ship's length, where sea loads are normally greatest.

**3.3.3** If there are indications of difficulty in operating and securing hatch covers, additional sets above those required by 3.3.2, at the discretion of the surveyor, should be tested in operation.

**3.3.4** Where the cargo hatch securing system does not function properly, repairs should be carried out under the supervision of the Administration. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with annex 13.

**3.3.5** For each cargo hatch cover set, at each annual survey, the following items should be surveyed:

- .1 cover panels, including side plates, and stiffener attachments that may be accessible in the open position by close-up survey (for corrosion, cracks, deformation);
- .2 sealing arrangements of perimeter and cross joints (gaskets for condition and permanent deformation, flexible seals on combination carriers, gasket lips, compression bars, drainage channels and non-return valves);
- .3 clamping devices, retaining bars, cleating (for wastage, adjustment, and condition of rubber components);
- .4 closed cover locating devices (for distortion and attachment);

- .5 chain or rope pulleys;
- .6 guides;
- .7 guide rails and track wheels;
- .8 stoppers;
- .9 wires, chains, tensioners and gypsies;
- .10 hydraulic system, electrical safety devices and interlocks; and
- .11 end and interpanel hinges, pins and stools where fitted.

**3.3.6** At each hatchway, at each annual survey, the coamings, with plating, stiffeners and brackets should be checked for corrosion, cracks and deformation, especially of the coaming tops.

**3.3.7** Where considered necessary, the effectiveness of sealing arrangements may be proved by hose or chalk testing supplemented by dimensional measurements of seal compressing components.

**3.3.8** Where portable covers, wooden or steel pontoons are fitted, the satisfactory condition of the following should be confirmed:

- .1 wooden covers and portable beams, carriers or sockets for the portable beam, and their securing devices;
- .2 steel pontoons, including close-up survey of hatch cover plating;
- .3 tarpaulins;
- .4 cleats, battens and wedges;
- .5 hatch securing bars and their securing devices;
- .6 loading pads/bars and the side plate edge;
- .7 guide plates and chocks;
- .8 compression bars, drainage channels and drain pipes (if any).

## **3.4** Examination of cargo holds

- **3.4.1** For bulk carriers over 10 years of age, the following should be carried out:
  - .1 overall survey of two selected cargo holds. Where a protective coating is provided in cargo holds and is found in GOOD condition, the extent of

close-up surveys and thickness measurements may be specially considered; and

- .2 when considered necessary by the surveyor, thickness measurement should be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements should be increased in accordance with annex 10.
- **3.4.2** For bulk carriers over 15 years of age, the following should be carried out:
  - .1 overall survey of all cargo holds. Where a protective coating is provided in cargo holds and is found in GOOD condition, the extent of close-up surveys and thickness measurements may be specially considered; and
  - .2 when considered necessary by the surveyor, thickness measurement should be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements should be increased in accordance with annex 10.

**3.4.3** All piping and penetrations in cargo holds, including overboard piping, should be examined for bulk carriers over 10 years of age.

# **3.5** Examination of ballast tanks

Examination of ballast tanks should be carried out when required as a consequence of the results of the renewal survey and intermediate survey. When considered necessary by the surveyor, thickness measurement should be carried out. If the results of these thickness measurements indicate that substantial corrosion is found, the extent of thickness measurements should be increased in accordance with annex 10.

## 4 Intermediate survey

## 4.1 General

**4.1.1** Notwithstanding the provisions of 1.1.2, items that are additional to the requirements of the annual survey may be surveyed either at the second or third annual survey or between these surveys.

**4.1.2** The extent of survey is dependent upon the age of the ship as specified in 4.2, 4.3 and 4.4.

# 4.2 Bulk carriers 5 to 10 years of age

## 4.2.1 Ballast tanks

**4.2.1.1** For spaces used for salt water ballast, an overall survey of representative spaces selected by the surveyor should be carried out. If such inspections reveal no visible structural defects, the examination may be limited to a verification that the protective coating remains efficient.
**4.2.1.2** Where POOR coating condition, corrosion or other defects are found in salt water ballast spaces or where protective coating was not applied from the time of construction, the examination should be extended to other ballast spaces of the same type.

**4.2.1.3** In salt water ballast spaces other than double bottom tanks, where a protective coating is found in POOR condition and it is not renewed, or where soft coating has been applied, or where a protective coating was not applied from the time of construction, the tanks in question should be examined and thickness measurements carried out as considered necessary at annual intervals. When such breakdown of coating is found in salt water ballast double bottom tanks, where a soft coating has been applied, or where a coating has not been applied, the tanks in question should be examined at annual intervals. When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurements should be carried out.

**4.2.1.4** In addition to the above requirements, areas found to be suspect areas at the previous renewal survey should be overall and close-up surveyed.

#### 4.2.2 Cargo holds

**4.2.2.1** An overall survey of all cargo holds should be carried out.

**4.2.2.2** Where considered necessary by the surveyor as a result of the overall survey of any one cargo hold as described in 4.2.2.1, the survey should be extended to include a close-up survey of that cargo hold as well as a close-up survey of sufficient extent of those areas of the structure as deemed necessary.

#### 4.2.3 Extent of thickness measurement

**4.2.3.1** Thickness measurement should be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to close-up survey as described in 4.2.2.1. The minimum requirement for thickness measurements at the intermediate survey are areas found to be suspect areas at the previous renewal survey.

**4.2.3.2** Where substantial corrosion is found, the extent of thickness measurements should be increased in accordance with the requirements of annex 10.

**4.2.3.3** The thickness measurement may be dispensed with provided the surveyor is satisfied by the close-up survey, that there is no structural diminution and the protective coating, where applied, remains effective.

#### 4.3 Bulk carriers 10 to 15 years of age

#### 4.3.1 Ballast tanks

**4.3.1.1** For bulk carriers:

All salt water ballast tanks should be examined. If such inspections reveal no visible structural defects, the examination may be limited to a verification that the protective coating remains efficient.

#### **4.3.1.2** For ore carriers:

- .1 all web frame rings in one ballast wing tank;
- .2 one deck transverse in each of the remaining ballast wing tanks;
- .3 both transverse bulkheads in one ballast wing tank; and
- .4 one transverse bulkhead in each remaining ballast wing tank.

**4.3.1.3** In addition, the requirements described in 4.2.1.2 to 4.2.1.4 apply.

#### 4.3.2 Cargo holds

**4.3.2.1** An overall survey of all cargo holds should be carried out.

**4.3.2.2** Where considered necessary by the surveyor as a result of the overall survey of any one cargo hold as described in 4.3.2.1, the survey should be extended to include a close-up survey of that cargo hold as well as a close-up survey of sufficient extent of those areas of the structure as deemed necessary.

#### 4.3.3 Extent of thickness measurement

**4.3.3.1** Thickness measurement should be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to close-up survey as described in 4.3.2.1. The minimum requirement for thickness measurements at the intermediate survey are areas found to be suspect areas at the previous renewal survey.

**4.3.3.2** In addition, the requirements described in 4.2.3.2 and 4.2.3.3 apply.

#### 4.4 Bulk carriers exceeding 15 years of age

**4.4.1** The requirements of the intermediate survey should be to the same extent as the previous renewal survey required in 2 and 5.1. However, pressure testing of tanks and cargo holds used for ballast is not required unless deemed necessary by the attending surveyor.

**4.4.2** In application of 4.4.1, the intermediate survey may be commenced at the second annual survey and be progressed during the succeeding year with a view to completion at the third annual survey in lieu of the application of 2.1.1.

#### 5 **Preparations for survey**

#### 5.1 Survey programme

**5.1.1** A specific survey programme should be worked out in advance of the renewal survey by the owner in co-operation with the Administration. The survey programme should be in a written format based on the information in annex 4A. The survey should not commence until the survey programme has been agreed.

**5.1.2** Prior to the development of the survey programme, the survey planning questionnaire should be completed by the owner based on the information set out in annex 4B, and forwarded to the Administration.

**5.1.3** In developing the survey programme, the following documentation should be collected and consulted with a view to selecting tanks, holds, areas and structural elements to be examined:

- .1 survey status and basic ship information;
- .2 documentation on board, as described in 7.2 and 7.3;
- .3 main structural plans (scantlings drawings), including information regarding use of high-tensile steels (HTS);
- .4 relevant previous survey and inspection reports from both the classification society and the owner;
- .5 information regarding the use of ship's holds and tanks, typical cargoes and other relevant data;
- .6 information regarding corrosion protection level on the new building; and
- .7 information regarding the relevant maintenance level during operation.

**5.1.4** The submitted survey programme should account for, and comply, as a minimum, with the provisions of annexes 1 and 2 and paragraph 2.7 for close-up survey, thickness measurement and tank testing, respectively, and should include relevant information, including at least:

- .1 basic ship information and particulars;
- .2 main structural plans (scantling drawings), including information regarding use of high-tensile steels (HTS);
- .3 plan of holds and tanks;
- .4 list of holds and tanks with information on use, protection and condition of coating;
- .5 conditions for survey (e.g., information regarding tank cleaning, gas-freeing, ventilation, lighting, etc.);
- .6 provisions and methods for access to structures;
- .7 equipment for surveys;
- .8 nomination of holds and tanks and areas for close-up survey (per annex 1);

- .9 nomination of sections for thickness measurement (per annex 2);
- .10 nomination of tanks for testing (per 2.7); and
- .11 damage experience related to ship in question.

**5.1.5** The Administration should advise the owner of the maximum acceptable structural corrosion diminution levels applicable to the ship.

**5.1.6** Use may also be made of the Guidelines for technical assessment in conjunction with the planning of enhanced surveys for bulk carriers, contained in annex 9. These Guidelines are a recommended tool which may be invoked at the discretion of the Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme.

#### 5.2 Conditions for survey

**5.2.1** The owner should provide the necessary facilities for a safe execution of the survey.

**5.2.2** In order to enable the attending surveyors to carry out the survey, provisions for proper and safe access, should be agreed between the owner and the Administration.

**5.2.3** Details of the means of access should be provided in the survey planning questionnaire.

**5.2.4** In cases where the provisions of safety and required access are judged by the attending surveyors not to be adequate, the survey of the spaces involved should not proceed.

**5.2.5** Cargo holds, tanks and spaces should be safe for access. Cargo holds, tanks and spaces should be gas free and properly ventilated. Prior to entering a tank, void or enclosed space, it should be verified that the atmosphere in the tank is free from hazardous gas and contains sufficient oxygen.

**5.2.6** Cargo holds, tanks and spaces should be sufficiently clean and free from water, scale, dirt, oil residues, sediments, etc., to reveal corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating. In particular, this applies to areas which are subject to thickness measurement.

**5.2.7** Sufficient illumination should be provided to reveal corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating.

**5.2.8** The surveyor(s) should always be accompanied by, at least, one responsible person, assigned by the owner, experienced in tank and enclosed spaces inspection. In addition, a back-up team of at least two experienced persons should be stationed at the hatch opening of the tank or space that is being surveyed. The back-up team should continuously observe the work in the tank or space and should keep life-saving and evacuation equipment ready for use.

**5.2.9** A communication system should be arranged between the survey party in the cargo hold, tank or space being examined, the responsible officer on deck and, as the case may be, the navigation bridge. The communication arrangements should be maintained throughout the survey.

#### **5.3** Access to structures<sup>\*</sup>

**5.3.1** For overall survey, means should be provided to enable the surveyor to examine the structure in a safe and practical way.

**5.3.2** For close-up survey, one or more of the following means for access, acceptable to the surveyor, should be provided:

- .1 permanent staging and passages through structures;
- .2 temporary staging and passages through structures;
- .3 lifts and moveable platforms;
- .4 portable ladders;
- .5 other equivalent means.

#### 5.4 Equipment for survey

**5.4.1** Thickness measurements should normally be carried out by means of ultrasonic test equipment. The accuracy of the equipment should be proven to the surveyor as required.

**5.4.2** One or more of the following fracture detection procedures may be required if deemed necessary by the surveyor:

- .1 radiographic equipment;
- .2 ultrasonic equipment;
- .3 magnetic particle equipment;
- .4 dye penetrant;
- .5 other equivalent means.

**5.4.3** Explosimeter, oxygen-meter, breathing apparatus, lifelines, riding belts with rope and hook and whistles together with instructions and guidance on their use should be made available during the survey. A safety check-list should be provided.

<sup>\*</sup> Refer to the Guidelines on the means of access to structures for inspection and maintenance of oil tankers and bulk carriers (MSC/Circ.686).

**5.4.4** Adequate and safe lighting should be provided for the safe and efficient conduct of the survey.

**5.4.5** Adequate protective clothing should be made available and used (e.g., safety helmet, gloves, safety shoes, etc.) during the survey.

#### 5.5 Survey at sea or at anchorage

**5.5.1** Survey at sea or at anchorage may be accepted provided the surveyor is given the necessary assistance from the personnel on board. Necessary precautions and procedures for carrying out the survey should be in accordance with 5.1, 5.2, 5.3 and 5.4.

**5.5.2** A communication system should be arranged between the survey party in the spaces and the responsible officer on deck.

**5.5.3** When rafts or boats will be used for close-up survey, the following conditions should be observed:

- .1 only rough duty, inflatable rafts or boats, having satisfactory residual buoyancy and stability even if one chamber is ruptured, should be used;
- .2 the boat or raft should be tethered to the access ladder and an additional person should be stationed down the access ladder with a clear view of the boat or raft;
- .3 appropriate lifejackets should be available for all participants;
- .4 the surface of water in the tank or hold should be calm (under all foreseeable conditions the expected rise of water within the tank should not exceed 0.25 m) and the water level either stationary or falling. On no account should the level of the water be rising while the boat or raft is in use;
- .5 the tank, hold or space should contain clean ballast water only. Even a thin sheen of oil on the water is not acceptable; and
- .6 at no time should the water level be allowed to be within 1 m of the deepest under deck web face flat so that the survey team is not isolated from a direct escape route to the tank hatch. Filling to levels above the deck transverses should only be contemplated if a deck access manhole is fitted and open in the bay being examined, so that an escape route for the survey party is available at all times. Other effective means of escape to the deck may be considered.

**5.5.4** Rafts or boats alone may be allowed for inspection of the under deck areas for tanks or spaces, if the depth of the webs is 1.5 m or less.

**5.5.5** If the depth of the webs is more than 1.5 m, rafts or boats alone may be allowed only:

- .1 when the coating of the under deck structure is in GOOD condition and there is no evidence of wastage; or
- .2 if a permanent means of access is provided in each bay to allow safe entry and exit. This means of access should be direct from the deck via a vertical ladder with a small platform fitted approximately 2 m below the deck. Other effective means of escape to the deck may be considered.

If neither of the above conditions are met, then staging or other equivalent means should be provided for the survey of the under deck areas.

**5.5.6** The use of rafts or boats alone in 5.5.4 and 5.5.5 does not preclude the use of boats or rafts to move about within a tank during a survey.

#### 5.6 Survey planning meeting

**5.6.1** The establishment of proper preparation and the close co-operation between the attending surveyor(s) and the owner's representatives onboard prior to and during the survey are an essential part in the safe and efficient conduct of the survey. During the survey on board safety meetings should be held regularly.

**5.6.2** Prior to commencement of any part of the renewal and intermediate survey, a survey planning meeting should be held between the attending surveyor(s), the owner's representative in attendance, the thickness measurement company operator (as applicable) and the master of the ship or an appropriately qualified representative appointed by the master or Company for the purpose to ascertain that all the arrangements envisaged in the survey programme are in place, so as to ensure the safe and efficient conduct of the survey work to be carried out.

**5.6.3** The following is an indicative list of items that should be addressed in the meeting:

- .1 schedule of the ship (i.e., the voyage, docking and undocking manoeuvres, periods alongside, cargo and ballast operations, etc.);
- .2 provisions and arrangements for thickness measurements (i.e., access, cleaning/de-scaling, illumination, ventilation, personal safety);
- .3 extent of the thickness measurements;
- .4 acceptance criteria (refer to the list of minimum thicknesses);
- .5 extent of close-up survey and thickness measurement considering the coating condition and suspect areas/areas of substantial corrosion;
- .6 execution of thickness measurements;

- .7 taking representative readings in general and where uneven corrosion/pitting is found;
- .8 mapping of areas of substantial corrosion; and
- .9 communication between attending surveyor(s) the thickness measurement company operator(s) and owner's representative(s) concerning findings.

#### 6 **Documentation on board**

#### 6.1 General

**6.1.1** The owner should obtain, supply and maintain on board the ship documentation as specified in 6.2 and 6.3, which should be readily available for the surveyor. The condition evaluation report referred to in 6.2 should include a translation into English.

6.1.2 The documentation should be kept on board for the lifetime of the ship.

#### 6.2 Survey report file

- 6.2.1 A survey report file should be a part of the documentation on board consisting of:
  - .1 reports of structural surveys (annex 6);
  - .2 condition evaluation report (annex 7); and
  - .3 thickness measurement reports (annex 8).

**6.2.2** The survey report file should be available also in the owner's and the Administration offices.

#### 6.3 Supporting documents

**6.3.1** The following additional documentation should be available on board:

- .1 main structural plans of holds and ballast tanks;
- .2 previous repair history;
- .3 cargo and ballast history;
- .4 inspections by ship's personnel with reference to:
  - .4.1 structural deterioration in general;
  - .4.2 leakages in bulkheads and piping;
  - .4.3 condition of coating or corrosion prevention system, if any. A guidance for reporting is shown in annex 3;

.5 survey programme as required by 5.1 until such time as the renewal survey has been completed,

and any other information that would help to identify critical structural areas and/or suspect areas requiring inspection.

#### 6.4 Review of documentation on board

Prior to survey, the surveyor should examine the completeness of the documentation on board, and its contents as a basis for the survey.

#### 7 **Procedures for thickness measurements**

#### 7.1 General

**7.1.1** The required thickness measurements, if not carried out by the recognized organization acting on behalf of the Administration, should be witnessed by a surveyor of the recognized organization. The surveyor should be on board to the extent necessary to control the process.

**7.1.2** The thickness measurement company should be part of the survey planning meeting to be held prior to commencing the survey.

**7.1.3** In all cases the extent of the thickness measurements should be sufficient as to represent the actual average condition.

7.1.4 Procedural requirements for thickness measurements are set out in annex 12.

#### 7.2 Certification of thickness measurement company

The thickness measurements should be carried out by a qualified company certified by an organization recognized by the Administration according to principles stated in annex 5.

#### 7.3 Reporting

**7.3.1** A thickness measurement report should be prepared and submitted to the Administration. The report should give the location of measurements, the thickness measured as well as corresponding original thickness. Furthermore, the report should give the date when the measurements were carried out, type of measuring equipment, names of personnel and their qualifications and be signed by the operator. The thickness measurement report should follow the principles as specified in the recommended procedures for thickness measurements set out in annex 8.

**7.3.2** The surveyor should verify and countersign the thickness measurement reports.

#### 8 Reporting and evaluation of survey

#### 8.1 Evaluation of survey report

**8.1.1** The data and information on the structural condition of the ship collected during the survey should be evaluated for acceptability and continued structural integrity of the ship.

**8.1.2** The analysis of data should be carried out and endorsed by the Administration and the conclusions of the analysis should form a part of the condition evaluation report.

#### 8.2 Reporting

**8.2.1** Principles for survey reporting are shown in annex 6.

**8.2.2** When a survey is split between different survey stations, a report should be made for each portion of the survey. A list of items examined and/or tested (pressure testing, thickness measurements etc.) and an indication of whether the item has been credited, should be made available to the next attending surveyor(s), prior to continuing or completing the survey.

**8.2.3** A condition evaluation report of the survey and results should be issued to the owner as shown in annex 7 and placed on board the ship for reference at future surveys. The condition evaluation report should be endorsed by the Administration.

# **REQUIREMENTS FOR CLOSE-UP SURVEY AT RENEWAL SURVEYS**

AGE ≤ 5 years	5 < AGE <u>&lt;</u> 10 years	10 < AGE <u>&lt;</u> 15 years	AGE > 15 years
1	2	3	4
One transverse web with associated plating and longitudinals in two representative water ballast	One transverse web with associated plating and longitudinals as applicable in each water ballast tank. (A)	All transverse webs with associated plating and longitudinals as applicable in each water ballast tank. (A)	All transverse webs with associated plating and longitudinals as applicable in each water ballast tank. (A)
tanks of each type. This is to include the foremost topside and double-side water ballast	Forward and aft transverse bulkhead including stiffening system in a transverse section including topside, hopper side and	All transverse bulkheads including stiffening system in each water ballast tank. (A)	All transverse bulkheads including stiffening system in
tanks on either side. (A)	double-side ballast tanks. (A)	25% of ordinary transverse frames in the foremost double-side tanks. (B)	each water ballast tank. (A)
Two selected cargo hold transverse bulkheads, including internal structure of upper and	25% of ordinary transverse frames in the foremost double-side tanks. (B)	All cargo hold transverse bulkheads including internal structure of upper and	All ordinary transverse frames in all double-side tanks. (B)
lower stools, where fitted. (C)	One transverse bulkhead in each cargo hold, including internal structure of upper and	lower stools, where fitted. (C)	Areas (C) – (E) as for column 3
All cargo hold hatch covers and coaming. (D)	lower stools, where fitted. (C)	All cargo hold hatch covers and coamings. (D)	
	All cargo hold hatch covers and coamings. (D)	All deck plating and under deck structures inside line of hatch openings between cargo	
	All deck plating and under deck structures inside line of hatch openings between cargo hold hatches. (E)	hold hatches. (E)	

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- (A) Transverse web or watertight transverse bulkhead in topside, hopper side and double-side ballast tanks. In fore and aft peak tanks transverse web means a complete transverse web frame ring including adjacent structural members.
- (B) Ordinary transverse frame in double-side tanks.
- (C) Cargo hold transverse bulkheads, platings, stiffeners and girders.
- (D) Cargo hold hatch covers and coamings.
- (E) Deck plating and under deck structure inside line of hatch openings between cargo hold hatches.

*Note*: Close-up survey of transverse bulkheads to be carried out at four levels:

- Level (a) Immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool.
- Level (b) Immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates.
- Level (c) About mid-height of the bulkhead.
- Level (d) Immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks.

# **REQUIREMENTS FOR THICKNESS MEASUREMENTS AT RENEWAL SURVEYS**

AGE ≤ 5 years	5 < AGE <u>&lt;</u> 10 years	10 < AGE <u>&lt;</u> 15 years	AGE > 15 years
1	2	3	4
1 Suspect areas	1 Suspect areas	1 Suspect areas	1 Suspect areas
	2 Within the cargo length area: two transverse sections of deck plating	2 Within the cargo length area:	2 Within the cargo length area.
	outside line of cargo hatch openings	.1 each deck plate outside line of cargo hatch openings	1 each deck plate outside
	<b>3</b> Measurement, for general assessment and recording of corrosion pattern, of those structural members subject to	.2 two transverse sections, one of which should be in the amidship area, outside line of cargo hatch openings	line of cargo hatch openings
	<ul><li>close-up survey according to annex 1</li><li>4 All cargo holds hatch covers and</li></ul>	<b>3</b> Measurement, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to annex 1	.2 three transverse sections, one of which should be in the
	<ul> <li>5 All deck plating inside line of openings between cargo hold batches</li> </ul>	4 All cargo hold hatch covers and coamings (plating and stiffeners)	line of cargo hatch openings
	<ul><li>6 Wind and water strakes in way of</li></ul>	5 All deck plating inside line of openings between cargo hold hatches	.3 each bottom plate
	transverse sections considered under point 2 above	6 All wind and water strakes within the cargo length area	<b>3</b> Points 3 to 7 referred to in column 3
		7 Selected wind and water strakes outside the cargo length area	

# **OWNER'S INSPECTION REPORT**

#### **Structural condition**

Ship's name:						
OWNER'S INS	SPECTION	REPORT – St	tructural condi	tion		
For tank/hold r	10.:					
Grade of steel:	dec. bott	k: tom:	si lo	de: ngitudinal bu	lkhead:	
Elements	Cracks	Buckles	Corrosion	Coating condition	Pitting	Modification/ Other repair
Deck:						
Bottom:						
Side:						
Side framing:						
Longitudinal bulkheads:						
Transverse bulkheads:						
Repairs carried	l out due to					
Thickness mea	surements of	carried out (da	ates):			
Results in general:						
Overdue surveys:						
Outstanding conditions of class:						
Comments:						
Date of inspect Inspected by: . Signature:	ion:					

#### ANNEX 4A

#### SURVEY PROGRAMME

#### **Basic information and particulars**

Name of ship:
IMO number:
Flag State:
Port of registry:
Gross tonnage:
Deadweight (metric tonnes):
Length between perpendiculars (m):
Shipbuilder:
Hull number:
Recognized organization (RO):
RO ship identity:
Date of delivery of the ship:
Owner:
Thickness measurement company:

#### 1 Preamble

#### 1.1 Scope

**1.1.1** The present survey programme covers the minimum extent of overall surveys, close-up surveys, thickness measurements and pressure testing within the cargo length area, cargo holds, ballast tanks, including fore and aft peak tanks, required by the Guidelines.

**1.1.2** The arrangements and safety aspects of the survey should be acceptable to the attending surveyor(s).

#### **1.2** Documentation

All documents used in the development of the survey programme should be available onboard during the survey as required by section 6.

#### 2 Arrangement of cargo holds, tanks and spaces

This section of the survey programme should provide information (either in the form of plans or text) on the arrangement of cargo holds, tanks and spaces that fall within the scope of the survey.

# 3 List of cargo holds, tanks and spaces with information on their use, extent of coatings and corrosion protection system

This section of the survey programme should indicate any changes relating to (and should update) the information on the use of the holds and tanks of the ship, the extent of coatings and the corrosion protective system provided in the Survey Planning Questionnaire.

#### 4 Conditions for survey

This section of the survey programme should provide information on the conditions for survey, e.g., information regarding cargo hold and tank cleaning, gas freeing, ventilation, lighting, etc.

#### 5 Provisions and method of access to structures

This section of the survey programme should indicate any changes relating to (and should update) the information on the provisions and methods of access to structures provided in the Survey Planning Questionnaire.

#### 6 List of equipment for survey

This section of the survey programme should identify and list the equipment that will be made available for carrying out the survey and the required thickness measurements.

#### 7 Survey requirements

#### 7.1 **Overall survey**

This section of the survey programme should identify and list the spaces that should undergo an overall survey for this ship in accordance with 2.4.1 and 2.5.1.

#### 7.2 Close-up survey

This section of the survey programme should identify and list the hull structures that should undergo a close-up survey for this ship in accordance with 2.5.2.

#### 8 Identification of tanks for tank testing

This section of the survey programme should identify and list the cargo holds and tanks that should undergo tank testing for this ship in accordance with 2.7.

#### 9 Identification of areas and sections for thickness measurements

This section of the survey programme should identify and list the areas and sections where thickness measurements should be taken in accordance with 2.6.1.

#### 10 Minimum thickness of hull structures

This section of the survey programme should specify the minimum thickness for hull structures of this ship that are subject to survey, according to .1 or .2:

- .1 Determined from the attached wastage allowance table and the original thickness to the hull structure plans of the ship;
- .2

 $\square$ 

Given in the following table(s):

Area or location	Original as-built	Minimum thickness	Substantial corrosion
	thickness	(mm)	thickness
	(mm)	()	(mm)
Deck			
Plating			
Longitudinals			
Longitudinal girders			
Cross deck plating			
Cross deck stiffeners			
Bottom			
Plating			
Longitudinals			
Longitudinal girders			
Inner bottom			
Plating			
Longitudinals			
Longitudinal girders			
Floors			
Ship side in way of			
topside tanks			
Plating			
Longitudinals			
Ship side in way of			
hopper side tanks			
Plating			
Longitudinals			
Ship side in way of			
double-side tanks			
(if applicable)			
Plating			
Longitudinals or ordinary			
transverse frames			
Longitudinal stringers			
Longitudinal bulkhead			
(if applicable)			
Plating			
Longitudinals			
(if applicable)			
Longitudinal girders			
(if applicable)			
Transverse bulkheads			
Plating			
Stiffeners (if applicable)			
Upper stool plating			
Upper stool stiffeners			
Lower stool plating			
Lower stool stiffeners			
Transverse web in			
topside tanks			
Plating			
Flanges			
Stiffeners			

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Transverse web in		
hopper tanks		
Plating		
Flanges		
Stiffeners		
Transverse web in		
double-side tanks		
Plating		
Flanges		
Stiffeners		
Hatch covers		
Plating		
Stiffeners		
Hatch coamings		
Plating		
Stiffeners		

*Note*: The wastage allowance tables should be attached to the survey programme.

#### 11 Thickness measurement company

This section of the survey programme should identify changes, if any, relating to the information on the thickness measurement company provided in the Survey Planning Questionnaire.

#### **12 Damage experience related to the ship**

This section of the survey programme should, using the tables provided below, provide details of the hull damages for at least the last three years in way of the cargo holds, ballast tanks and void spaces within the cargo length area. These damages are subject to survey.

Cargo hold, tank or space number or area	Possible cause, if known	Description of the damages	Location	Repair	Date of repair

#### Hull damages sorted by location for this ship

#### Hull damages for sister or similar ships (if available) in the case of design related damage

Cargo hold, tank or space number or area	Possible cause, if known	Description of the damages	Location	Repair	Date of repair

#### 13 Areas identified with substantial corrosion from previous surveys

This section of the survey programme should identify and list the areas of substantial corrosion from previous surveys.

#### 14 Critical structural areas and suspect areas

This section of the survey programme should identify and list the critical structural areas and the suspect areas, when such information is available.

#### 15 Other relevant comments and information

This section of the survey programme should provide any other comments and information relevant to the survey.

#### Appendices

#### **Appendix 1 – List of plans**

The provisions of 5.1.4.2 require that the main structural plans of cargo holds and ballast tanks (scantling drawings), including information regarding the use of high-tensile steel (HTS), should be available. This appendix of the survey programme should identify and list the main structural plans which form part of the survey programme.

#### **Appendix 2 – Survey Planning Questionnaire**

The Survey Planning Questionnaire (annex 4B), which has been submitted by the owner, should be appended to the survey programme.

#### **Appendix 3 – Other documentation**

This part of the survey programme should identify and list any other documentation that forms part of the plan.

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Prepared by the owner in co-operation with the Administration for compliance with 5.1.4.

Date:	(name and signature of authorized owner's representative)
Date:	(name and signature of authorized representative of the Administration)

#### ANNEX 4B

#### SURVEY PLANNING QUESTIONNAIRE

1 The following information will enable the owner, in co-operation with the Administration, to develop a Survey Plan complying with the requirements of the Guidelines. It is essential that the owner provides, when completing the present questionnaire, up-to-date information. The present questionnaire, when completed, should provide all information and material required by the Guidelines.

#### Particulars

Ship's name: IMO number: Flag State: Port of registry: Owner: Recognized organization: Gross tonnage: Deadweight (metric tonnes): Date of delivery:

#### Information on access provision for close-up surveys and thickness measurement

2 The owner should indicate, in the table below, the means of access to the structures subject to close-up survey and thickness measurement. A close-up survey is an examination where the details of structural components are within the close visual inspection range of the attending surveyor, i.e., preferably within reach of hand.

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Hold/Tank	Structure	Temporary	Rafts	Ladders	Direct	Other means
ED.	Eara naal	staging			access	(please specify)
Г.Р. А.Р	Afreel					
A.P.	Alt peak					
	Hatch side coamings					
	Topside sloping plate					
lds	Opper stool plating					
hol	Cross deck			_		
08	Double-side tank plating					
Car	Iransverse bulkhead					
$\cup$	Hopper tank platting					
	Lower stool					
	Tank top					
e	Under deck structure					
sid	Side shell and structure					
op tar	Sloping plate and structure					
E	Webs and bulkheads					
ks	Hopper sloping plate and					
an	structure					
er 1	Side shell and structure					
ddo	Bottom structure					
Нс	Webs and bulkheads					
side	Side shell and structure					
uble- tanks	Inner skin and structure					
Doi	Webs and bulkheads					
	Double bottom structure					
	Upper stool internal structure					
	Lower stool internal structure					
	Under deck and structure					
10	Side shell and structure					
anks of e carriers	Side shell vertical web and					
	structure					
	Longitudinal bulkhead and					
g ti	structure					
Vin ble	Longitudinal bulkhead web and					
V lou	structure					
	Bottom plating and structure					
	Cross ties/stringers					

# History of bulk cargoes of a corrosive nature (e.g., high sulphur content)

#### **Owner's inspections**

3 Using a format similar to that of the table below (which is given as an example), the owner should provide details of the results of their inspections, for the last 3 years – in accordance with the Guidelines – on all CARGO holds and BALLAST tanks and VOID spaces within the cargo area.

Tank/Hold No.	Corrosion protection (1)	Coating extent (2)	Coating condition (3)	Structural deterioration (4)	Hold and tank history (5)
Cargo holds					
Topside tanks					
Hopper tanks					
Double-side					
skin tanks					
Double bottom					
tanks					
Upper stools					
Lower stools					
Wing tanks (ore carriers)					
Fore peak					
Aft peak					
Miscellaneous other spaces:					

*Note:* Indicate tanks which are used for oil/ballast.

1)	HC = hard coating; SC = soft coating;	
	A = anodes; NP = no protection	
2)	U = upper part; M = middle part; L = lower	Name of owner's representative:
	part; $C = complete$	
3)	G = good; $F = fair;$ $P = poor;$	
	RC = recoated (during the last 3 years)	
4)	N = no findings recorded; $Y = findings$	
	recorded, description of findings should be	Signature:
	attached to this questionnaire	
5)	DR = damage and repair; L = leakages;	
	CV = conversion (description to be attached	Date:
	to this questionnaire)	

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# **Reports of port State control inspections**

List the reports of port State control inspections containing hull structural related deficiencies, relevant information on rectification of the deficiencies:

#### Safety management system

List non-conformities related to hull maintenance, including the associated corrective actions:

# Name and address of the approved thickness measurement company:

#### PROCEDURES FOR CERTIFICATION OF A COMPANY ENGAGED IN THICKNESS MEASUREMENT OF HULL STRUCTURES

#### 1 Application

This guidance applies for certification of the company which intends to engage in the thickness measurement of hull structures of ships.

#### 2 **Procedures for certification**

#### Submission of documents

**2.1** The following documents should be submitted to an organization recognized by the Administration for approval:

- .1 outline of the company, e.g., organization and management structure;
- .2 experience of the company on thickness measurement of hull structures of ships;
- .3 technicians' careers, i.e., experience of technicians as thickness measurement operators, technical knowledge and experience of hull structure, etc. Operators should be qualified according to a recognized industrial NDT Standard;
- .4 equipment used for thickness measurement such as ultrasonic testing machines and their maintenance/calibration procedures;
- .5 a guide for thickness measurement operators;
- .6 training programmes for technicians for thickness measurement;
- .7 measurement record format in accordance with recommended procedures for thickness measurements (see annex 8).

#### Auditing of the company

**2.2** Upon reviewing the documents submitted with satisfactory results, the company should be audited in order to ascertain that the company is duly organized and managed in accordance with the documents submitted, and eventually is capable of conducting thickness measurement of the hull structure of ships.

**2.3** Certification is conditional upon an on-board demonstration of thickness measurement as well as satisfactory reporting.

#### 3 Certification

**3.1** Upon satisfactory results of both the audit of the company referred to in 2.2 and the demonstration tests referred to in 2.3, the Administration or organization recognized by the Administration should issue a certificate of approval as well as a notice to the effect that the thickness measurement operation system of the company has been certified.

**3.2** Renewal/endorsement of the certificate should be made at intervals not exceeding three years by verification that original conditions are maintained.

#### 4 Report of any alteration to the certified thickness measurement operation system

In cases where any alteration to the certified thickness measurement operation system of the company is made, such an alteration should be immediately reported to the organization recognized by the Administration. Re-audit should be made where deemed necessary by the organization recognized by the Administration.

#### 5 Withdrawal of the certification

The certification may be withdrawn in the following cases:

- .1 where the measurements were improperly carried out or the results were improperly reported;
- .2 where the surveyor found any deficiencies in the approved thickness measurement operation systems of the company; and
- .3 where the company failed to report any alteration referred to in 4 to the organization recognized by the Administration as required.

#### SURVEY REPORTING PRINCIPLES

As a principle, for bulk carriers subject to the Guidelines, the surveyor should include the following contents in his report for survey of hull structure and piping systems, as relevant for the survey.

#### 1 General

- **1.1** A survey report should be generated in the following cases:
  - .1 in connection with commencement, continuation and/or completion of periodical hull surveys, i.e., annual, intermediate and renewal surveys, as relevant;
  - .2 when structural damages/defects have been found;
  - .3 when repairs, renewals or modifications have been carried out; and
  - .4 when condition of class (recommendation) has been imposed or has been deleted.
- **1.2** The reporting should provide:
  - .1 evidence that prescribed surveys have been carried out in accordance with applicable requirements;
  - .2 documentation of surveys carried out with findings, repairs carried out and condition of class (recommendation) imposed or deleted;
  - .3 survey records, including actions taken, which should form an auditable documentary trail. Survey reports should be kept in the survey report file required to be on board;
  - .4 information for planning of future surveys; and
  - .5 information which may be used as input for maintenance of classification rules and instructions.

**1.3** When a survey is split between different survey stations, a report should be made for each portion of the survey. A list of items surveyed, relevant findings and an indication of whether the item has been credited, are to be made available to the next attending surveyor, prior to continuing or completing the survey. Thickness measurement and tank testing carried out is also to be listed for the next surveyor.

#### 2 Extent of the survey

2.1 Identification of compartments where an overall survey has been carried out.

**2.2** Identification of locations, in each ballast tank and cargo hold including hatch covers and coamings, where a close-up survey has been carried out, together with information on the means of access used.

**2.3** Identification of locations, in each ballast tank and cargo hold including hatch covers and coamings, where thickness measurement has been carried out.

*Note:* As a minimum, the identification of location of close-up survey and thickness measurement should include a confirmation with description of individual structural members corresponding to the extent of requirements stipulated in Annex A based on type of periodical survey and the ship's age.

Where only partial survey is required, e.g., one transverse web, two selected cargo hold transverse bulkheads, the identification should include location within each ballast tank and cargo hold by reference to frame numbers.

**2.4** For areas in ballast tanks and cargo holds where protective coating is found to be in good condition and the extent of close-up survey and/or thickness measurement has been specially considered, structures subject to special consideration should be identified.

**2.5** Identification of tanks subject to tank testing.

**2.6** Identification of piping systems on deck and within cargo holds, ballast tanks, pipe tunnels, cofferdams and void spaces where:

- .1 examination including internal examination of piping with valves and fittings and thickness measurement, as relevant, has been carried out; and
- .2 operational test to working pressure has been carried out.

#### **3 Result of the survey**

**3.1** Type, extent and condition of protective coating in each tank, as relevant (rated GOOD, FAIR or POOR) including identification of tanks fitted with anodes.

- **3.2** Structural condition of each compartment with information on the following, as relevant:
  - .1 identification of findings, such as:
    - .1.1 corrosion with description of location, type and extent;
    - **.1.2** areas with substantial corrosion;
    - .1.3 cracks/fractures with description of location and extent;
    - .1.4 buckling with description of location and extent; and
    - .1.5 indents with description of location and extent;

- .2 identification of compartments where no structural damages/defects are found. The report may be supplemented by sketches/photos; and
- .3 thickness measurement report should be verified and signed by the surveyor controlling the measurements on board.

#### 4 Actions taken with respect to findings

**4.1** Whenever the attending surveyor is of the opinion that repairs are required, each item to be repaired should be identified in a numbered list. Whenever repairs are carried out, details of the repairs effected should be reported by making specific reference to relevant items in the numbered list.

- **4.2** Repairs carried out should be reported with identification of:
  - .1 compartment;
  - .2 structural member;
  - .3 repair method (i.e., renewal or modification), including:
    - .3.1 steel grades and scantlings (if different from the original); and
    - **.3.2** sketches/photos, as appropriate;
  - .4 repair extent; and
  - .5 non-destructive test (NDT)/tests.

**4.3** For repairs not completed at the time of survey, condition of class/recommendation should be imposed with a specific time limit for the repairs. In order to provide correct and proper information to the surveyor attending for survey of the repairs, condition of class/recommendation should be sufficiently detailed with identification of each item to be repaired. For identification of extensive repairs, reference may be made to the survey report.

#### **CONDITION EVALUATION REPORT Issued upon completion of renewal survey**

#### General particulars

Ship's name:	Class/Administration identity number: Previous class/Administration identity number(s): IMO number:
Port of registry:	National flag: Previous national flag(s):
Deadweight (metric tonnes):	Gross tonnage: National: ITC (1969):
Date of build:	Classification notation:
Date of major conversion:	
Type of conversion:	Owner: Previous owner(s)

- 1 The survey reports and documents listed below have been reviewed by the undersigned and found to be satisfactory
- 2 The renewal survey has been completed in accordance with the present Guidelines on (date) .....

Condition evaluation report completed by	Name Signature	Title
Office	Date	
Condition evaluation report verified by	Name Signature	Title
Office	Date	

Attached reports and documents:

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)

# Contents of condition evaluation report

Part 1 –	General particulars:	—	See front page
Part 2 –	Report review:	_	Where and how survey was done
Part 3 –	Close-up survey:	_	Extent (which tanks/holds)
Part 4 –	Thickness measurements:		Reference to thickness measurement report Summary of where measured Separate form indicating the spaces with substantial corrosion, and corresponding: - thickness diminution - corrosion pattern
Part 5 –	Tank corrosion prevention system:	_	Separate form indicating: location of coating/anodes - condition of coating (if applicable)
Part 6 –	Repairs:	_	Identification of spaces/areas
Part 7 –	Condition of class/flag State requirements:		
Part 8 –	Memoranda:		Acceptable defects Any points of attention for future surveys, e.g., for suspect areas Extended annual/intermediate survey due to coating breakdown
Part 9 –	Conclusion:	_	Statement on evaluation/verification of survey report

# Extract of thickness measurements

Reference is made to the thickness measurement report:

Position of substantially corroded tanks/areas <sup>1</sup> or areas with deep pitting <sup>3</sup>	Thickness diminution [%]	Corrosion pattern <sup>2</sup>	Remarks: e.g. (e.g., ref. attached sketches)

#### *Notes:*

- 1 Substantial corrosion, i.e., 75% 100% of acceptable margins wasted.
- 2 P = PittingC = Corrosion in general
- 3 Any bottom plating with a pitting intensity of 20% or more, with wastage in the substantial corrosion range or having an average depth of pitting of 1/3 or more of actual plate thickness should be noted.

#### Tank/hold corrosion prevention system

Tank/hold Nos. <sup>1</sup>	Tank/hold corrosion prevention system <sup>2</sup>	Coating condition <sup>3</sup>	Remarks

#### Notes:

- 1 All ballast tanks and cargo holds should be listed.
- 2 C = Coating A = Anodes NP = No protection
- 3 Coating condition according to the following standard:
  - GOOD condition with only minor spot rusting.
  - FAIR condition with local breakdown of coating at edges of stiffeners and weld connections and/or light rusting over 20% or more of areas under consideration, but less than as defined for POOR condition.
  - POOR condition with general breakdown of coating over 20% or more of areas or hard scale at 10% or more of areas under consideration.

If coating condition POOR is given, extended annual surveys should be introduced. This should be noted in part 7 of the Contents of condition evaluation report.

#### **RECOMMENDED PROCEDURES FOR THICKNESS MEASUREMENTS**

1 This annex should be used for recording thickness measurements as required by part B of Annex A.

2 Thickness measurement sheet forms TM1-DSBC, TM2-DSBC, TM3-DSBC, TM4-DSBC, TM5-DSBC and TM6-DSBC (appendices 2 to 5) should be used, as appropriate, for recording thickness measurements and these sheets should be bound with the cover sheet of the report of GENERAL PARTICULARS in appendix 1. The maximum allowable diminution should be stated. The maximum allowable diminution could be stated in an attached document.

3 Appendices 3 to 5 are guidance diagrams and notes relating to the reporting forms and the procedure for the thickness measurements.

#### **APPENDIX 1**

# THICKNESS MEASUREMENT REPORT

#### **GENERAL PARTICULARS**

Ship's name:	
IMO Number:	
Administration Identification Number:	
Port of registry:	
Gross tonnage:	
Deadweight:	
Date of build:	
Classification society:	
Name of Company performing the thickness measu	rement:
Thickness measurement company certified by:	
Certificate No.:	
Certificate valid from:	to
Place of measurement:	
First date of measurement:	
Last date of measurement:	
Renewal survey/intermediate survey* due:	
Details of measurement equipment:	
Qualification of operator:	
Report Number	
Consisting of Forms	
consisting of minima comp	
Name of operator:	Name of surveyor:
Signature of operator:	Signature of surveyor:
Company official stamp:	Administration official stamp:

<sup>\*</sup> Delete as appropriate.

Report on THICKNESS MEASUREMENT OF ALL DECK PLATING, ALL BOTTOM SHEEL PLATING AND SIDE SHELL PLATING\* (\* - delete as appropriate) TM1-DSBC

STRAKE POSITION PLATE No. or Thk. POSITION Letter mm 2th forward Letter mm th bth															
PLATE No. or Thk. POSITION Letter mm 2th forward Ith 0th h															
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1th Dth th															
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# **APPENDIX 2**

#### NOTES TO REPORT TM1–DSBC

- 1 This report should be used for recording the thickness measurement of:
  - .1 all strength deck plating within cargo length area;
  - .2 all keel, bottom shell plating and bilge plating within the cargo length area;
  - .3 side shell plating including selected wind and water strakes outside cargo length area; and
  - .4 all wind and water strakes within cargo length area.
- 2 The strake position should be cleared as follows:
  - .1 for strength deck indicate the number of the strake of plating inboard from the stringer plate;
  - .2 for bottom plating indicate the number of the strake of plating outboard from the keel plate; and
  - .3 for side shell plating give number of the strake of plating sheerstrake and letter as shown on shell expansion.
- 3 Only the deck plating strakes outside line of openings are to be recorded.
- 4 Measurements should be taken at the forward and aft areas of all plates and where plates cross ballast/cargo tank boundaries separate measurements for the area of plating in way of each type of tank should be recorded.
- 5 The single measurements recorded are to represent the average of multiple measurements.
- 6 The maximum allowable diminution could be stated in an attached document.
Report on THICKNESS MEASUREMENT OF SHELL AND DECK PLATING at transverse sections (one, two or three transverse sections) TM2-DSBC(i)

STRAKE PLATING           STRAKE         No.         No.<																									
Image: Plane interview									STRENG	TH DE	CK Al	ND SH	EER	STRA	KE PLA	TING									
STRACE         No.         Order         Mare         Description         No.         Order         Mare         Description         Mare         Description         Mare         <		FIF	RST TI	RANSV	/ERS NU	E SE( MBE	CTION /	AT FR	RAME	SE(	COND	TRAN	ISVE N	RSE SUMBI	SECTIO ER	N AT	FRAME	TF	HRD 7	[RAN!	SVER!	SE SE IMBE	CTION R	ATFF	tAME
MM         MM<	STRAKE POSITION	No. or	Org. Thk.	Max. Alwb. Dim.	Gau	I ged	Diminuti	on D	himinution S	No. Or I atter	Org. Thk.	Max. Alwb Dim.	Ga	uged	Diminu P	tion 1	Diminutior S	OI. Of	Org Thk	Max Alwb Dim.	. Gau	I pag	Jiminut P	on Di	ninuti S
Stringer Mate         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         <			mm	mm	Р	s	é mm	и %	0% mu	Fdie	mm	mm	Ч	s	mm	%	% uuu	1	uu	mm	Р	s	mm	, m	° u
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13th       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1	12th					-		-				_				-			_		-	-	-	_	-
14th	13th												-											-	
centre strake         centre         centre strake         centre strake </td <td>14th</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td>-</td>	14th							-								-								_	-
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TOPSIDE TOTAL	sheer strake					-						-				-						-	-	_	-
	TOPSIDE TOTAL																			-	-			-	-

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#### NOTES TO REPORT TM2-DSBC(i)

1 This report should be used for recording the thickness measurement of:

Strength deck plating and sheerstrake plating transverse sections:

One, two or three sections within the cargo length area, comprising the structural items (0), (1) and (2) as shown on the diagrams of typical transverse sections (Appendices 3 and 4).

- 2 Only the deck plating strakes outside line of hatch openings should be recorded.
- 3 The top side area comprises deck plating, stringer plate and sheerstrake (including rounded gunwales).
- 4 The exact frame station of measurement should be stated.
- 5 The single measurements recorded should represent the average of multiple measurements.
- 6 The maximum allowable diminution could be stated in an attached document.

Report on THICKNESS MEASUREMENT OF SHELL AND DECK PLATING at transverse sections (one, two or three transverse sections) TM2-DSBC(ii)

Ship's name							Class ]	dentit	y No.						Repo	Mt No.				1	IMO	No			
										SHEL	L PLA	TING													
	FIR	IT TS	VANSV	/ERS NU	E SE( MBE	CTION A R	T FRA	ME	SEC	OND:	TRAN	SVE	RSE S JMBE	ECT 10 R	IA N	FRAM	<u>ы</u>	THIRL	D TRA	NSVE	ERSE 5	SECTIO	(NA)	l FRA	ME
STRAKE POSITION	No. or	Org. Thk.	Max. Alwb. Dim.	Gaug	I	Nimito	n Dim	imution S	No.	Org. Thk	Max. Alwb. Dim.	Gau	l logi	Miniu P	tion 1	Diminut	ion N	b. TI	kies D∐∑M	ax. wb. O	anged	Dimi	mution P	Dimit	wition S
	Tottol.	BB	mm	Р	ŝ	mm %	B	%	interra	BB	mm	Р	s	BB	%	mm	*	E Internet	B	8	PS	B	%	BB	9%
1st below sheer strake													$\vdash$		$\vdash$		$\vdash$		$\vdash$	$\vdash$					
2nd																	$\vdash$		┝						
3rd																	$\vdash$		┝						
伯伯																	┝		┝						
Sth																			$\vdash$						
6th																									
7th															$\vdash$		$\vdash$		$\vdash$	$\vdash$					
8th															$\vdash$		$\vdash$		$\vdash$	┢					
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#### NOTES TO REPORT TM2-DSBC(ii)

1 This report should be used for recording the thickness measurement of:

Shell plating at transverse sections:

One, two or three sections within the cargo length area, comprising the structural items (3), (4), (5) and (6) as shown on the diagrams of typical transverse sections in appendices 3 and 4.

- 2 The bottom area comprises keel, bottom and bilge plating.
- 3 The exact frame station of measurement should be stated.
- 4 The single measurements recorded should represent the average of multiple measurements.
- 5 The maximum allowable diminution could be stated in an attached document.

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#### NOTES TO REPORT TM3-DSBC

1 This report should be used for recording the thickness measurement of:

Longitudinal members at transverse sections:

Two, or three sections within the cargo length area comprising the appropriate structural items (10) to (25) as shown on diagrams of typical transverse sections in appendices 3 and 4.

- 2 The exact frame station of measurement should be stated.
- 3 The single measurements recorded should represent the average of multiple measurements.
- 4 The maximum allowable diminution could be stated in an attached document.

% Diminution S : IMO No. mm Report on THICKNESS MEASUREMENT OF TRANSVERSE STRUCTURAL MEMBERS % Diminution P In the double bottom, hopper side and topside water ballast tanks mm Report No. s Gauged -4 Max. Alwb. Dim. mm Class Identity No. Original Thickness mm ITEM STRUCTURAL MEMBER LOCATION OF STRUCTURE: TANK DESCRIPTION: Ship's name ..... TM4-DSBC

NOTES - See Reverse

Operator's Signature ......

#### NOTES TO REPORT TM4-DSBC

1 This report should be used for recording the thickness measurement:

Transverse structural members, comprising the appropriate structural items (30) to (34) as shown on diagrams of typical transverse sections illustrated in appendices 3 and 4.

- 2 Guidance for areas of measurements is indicated in appendix 5.
- 3 The single measurements recorded should represent the average of multiple measurements.
- 4 The maximum allowable diminution could be stated in an attached document.

Report on THICKNESS OF WATERTIGHT TRANSVERSE BULKHEADS IN CARGO HOLDS

LOCATION OF STRUCTURE:						FRAME NO		
STRUCTURAL COMPONENT (PLATING/STIFFENER)								
	Original Thickness	Max. Alwb. Dim.	Gai	pagu	Dimin	ution	Dimir	ution
	mm	mm	Port	Starboard	mm	%	mm	0%
	-							
							•	
							•	
							-	
							•	
Operator's Signature						NO	TES – See R	everse

TM5-DSBC

#### NOTES TO REPORT TM5-DSBC

1 This report should be used for recording the thickness measurement of:

Watertight transverse bulkheads in cargo holds.

- 2 Guidance for areas of measurements is indicated in appendix 3.
- 3 The single measurements recorded should represent the average of multiple measurements.
- 4 The maximum allowable diminution could be stated in an attached document.

IMO No. NOTES - See Reverse Report on THICKNESS MEASUREMENT OF MISCELLANEOUS STRUCTURAL MEMBERS SKETCH Report No. . .... Diminution S % ..... mm Diminution P % -Class Identity No. mm s Gauged д, ..... Max. Alwb. Dim. mm Org. Thk mm Operator's Signature ...... LOCATION OF STRUCTURE: STRUCTURAL MEMBER: Description Ship's name ..... TM6-DSBC

#### NOTES TO REPORT TM6-DSBC

1 This report should be used for recording the thickness measurement of:

Miscellaneous structural members including the structural items (40), (41) and (42) as shown on diagrams of typical transverse sections illustrated in Appendix 3.

- 2 Guidance for areas of measurements is indicated in appendix 5.
- 3 The single measurements recorded should represent the average of multiple measurements.
- 4 The maximum allowable diminution could be stated in an attached document.

#### **APPENDIX 3**

#### THICKNESS MEASUREMENT – DOUBLE-SIDE SKIN CONSTRUCTION

Typical transverse section of a double skin bulk carrier with indication of longitudinal and transverse members.



Report on TM2-DSBC(i) and (ii)	Report on	TM3-DSBC	<b>Report on TM4-DSBC</b>	
1 Strength deck plating	8 Deck longitudinals	17 Inner bottom plating	23 Double bottom tank floors	
2 Stringer plate	9 Deck girders	18 Inner bottom longitudinals	25 Hopper side tank transverses	
3 Sheerstrake	10 Sheerstrake		34 Transverse web frame	
4 Side shell plating	longitudinals	19 Hopper plating	- Topside tank transverses	
5 Bilge plating	11 Topside tank sloping	20 Hopper longitudinals		
6 Bottom shell plating	plating	31 Inner side plating		
7 Keel plate	12 Topside tank sloping	- Inner side		
	plating longitudinals	longitudinals, if any	Report on TM6-DSBC	
	13 Bottom longitudinals	- Horizontal girders in		
	14 Bottom girders	wing ballast tanks	28 Hatch coamings	
	15 Bilge longitudinals		- Deck plating between	
	16 Side shell longitudinals, if any		hatches - Hatch covers	

#### **APPENDIX 4**

### THICKNESS MEASUREMENT – ORE CARRIERS

Typical transverse section of an ore carrier with indication of longitudinal and transverse members.



Т	Report on M2-DSBC(i) and (ii)
1	Strength deck plating
2	Stringer plate
3	Sheerstrake
4	Side shell plating
5	Bilge plating
6	Bottom shell plating
7	Keel plate
Re	eport on TM6-DSBC

Report on TM6-DSBC
36 Hatch coamings
37 Deck plating between hatches
38 Hatch covers
39
40

	<b>Report on TM3-DSBC</b>
8	Deck longitudinals
9	Deck girders
10	Sheerstrake longitudinals
11	Longitudinal bulkhead top strake
12	Bottom longitudinals
13	Bottom girders
14	Bilge longitudinals
15	Longitudinal bulkhead lower strake
16	Side shell longitudinals
17	Longitudinal bulkhead plating
	(remainder)
18	Longitudinal bulkhead longitudinals
19	Inner bottom plating
20	Inner bottom longitudinals
21	
22	
23	
24	

	<b>Report on TM4-DSBC</b>
25	Deck transverse centre tank
26	Bottom transverse centre tank
27	Deck transverse wing tank
28	Side shell vertical web
29	Longitudinal bulkhead vertical web
30	Bottom transverse wing tank
31	Struts
32	Transverse web face plate
33	Double bottom floors
34	
35	

#### **APPENDIX 5**

#### THICKNESS MEASUREMENT – DOUBLE-SIDE SKIN CONSTRUCTION

Transverse section outline: the diagram may be used for those ships where the diagrams given in appendices 3 and 4 are not suitable.



T	Report on M2-DSBC(i) and (ii)
1	Strength deck
	plating
2	Stringer plate
3	Sheerstrake
4	Side shell plating
5	Bilge plating
6	Bottom shell plating
7	Keel plate

	Report on T	ГМЗ-DSBC
8	Deck longitudinals	17 Inner bottom plating
9	Deck girders	18 Inner bottom longitudinals
10	Sheerstrake	
	longitudinals	19 Hopper plating
11	Topside tank sloping	20 Hopper longitudinals
	plating	31 Inner side plating
12	Topside tank sloping plating longitudinals	- Inner side longitudinals, if any
13	Bottom longitudinals	- Horizontal girders in
14	Bottom girders	wing ballast tanks
15	Bilge longitudinals	
16	Side shell longitudinals, if any	

- 23 Double bottom tank
- floors 25 Hopper side tank transverses
- 34 Transverse web frame

- Topside tank transverses

#### Report on TM6-DSBC

- 28 Hatch coamings
- Deck plating between hatches
- Hatch covers

#### ANNEX 9

#### GUIDELINES FOR TECHNICAL ASSESSMENT IN CONJUNCTION WITH PLANNING FOR ENHANCED SURVEYS OF BULK CARRIERS\*

#### **1 INTRODUCTION**

These guidelines contain information and suggestions concerning technical assessments, which may be of use in conjunction with the planning of enhanced surveys of double skin bulk carriers. As indicated in 5.1.6, the guidelines are a recommended tool which may be invoked at the discretion of the Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme.

#### 2 PURPOSE AND PRINCIPLES

#### 2.1 Purpose

**2.1.1** The purpose of the technical assessments described in these guidelines is to assist in identifying critical structural areas, nominating suspect areas and in focusing attention on structural elements or areas of structural elements which may be particularly susceptible to, or evidence a history of, wastage or damage. This information may be useful in nominating locations, areas holds and tanks for thickness measurement, close-up survey and tank testing.

**2.1.2** Critical structural areas are locations which have been identified from calculations to require monitoring or from the service history of the subject ship or from similar or sister ships (if available) to be sensitive to cracking, buckling or corrosion which would impair the structural integrity of the ship.

#### 2.2 Minimum requirements

However, these guidelines may not be used to reduce the requirements pertaining to thickness measurement, close-up survey and tank testing contained in annexes 1 and 2 of part B and in paragraph 2.7, respectively, which, in all cases, should be complied with as a minimum.

#### 2.3 Timing

As with other aspects of survey planning, the technical assessments described in these guidelines should be worked out by the owner or operator in co-operation with the Administration well in advance of the commencement of the renewal survey, i.e., prior to commencing the survey and normally at least 12 to 15 months before the survey's completion due date.

References:

<sup>1</sup> IACS, "Unified Requirement Z10.5, "Hull Surveys of Double Skin Bulk Carriers""

<sup>2</sup> IACS, "Bulk Carriers: Guidelines for Surveys, Assessment and Repair of Hull Structures, January 2002"

<sup>3</sup> TSCF, "Guidelines for the Inspection and Maintenance of Double Hull Tanker Structures, 1995"

<sup>4</sup> TSCF, "Guidance Manual for Tanker Structures, 1997"

#### 2.4 Aspects to be considered

**2.4.1** Technical assessments, which may include quantitative or qualitative evaluation of relative risks of possible deterioration, of the following aspects of a particular ship may be used as a basis for the nomination of holds, tanks and areas for survey:

- .1 design features such as stress levels on various structural elements, design details and extent of use of high-tensile steel;
- .2 former history with respect to corrosion, cracking, buckling, indents and repairs for the particular ship as well as similar vessels, where available; and
- .3 information with respect to types of cargo carried, use of different holds/tanks for cargo/ballast, protection of holds and tanks and condition of coating, if any.

**2.4.2** Technical assessments of the relative risks of susceptibility to damage or deterioration of various structural elements and areas are to be judged and decided on the basis of recognized principles and practices, such as may be found in references 2, 3 and 4.

#### **3 TECHNICAL ASSESSMENT**

#### 3.1 General

**3.1.1** There are three basic types of possible failure, which may be the subject of technical assessment in connection with planning of surveys; corrosion, cracks and buckling. Contact damages are not normally covered by the survey planning since indents are usually noted in memoranda and assumed to be dealt with as a normal routine by surveyors.

**3.1.2** Technical assessments performed in conjunction with the survey planning process should, in principle, be as shown schematically in figure 1. The approach is basically an evaluation of the risk in the following aspects based on the knowledge and experience related to:

- .1 design; and
- .2 corrosion.

**3.1.3** The design should be considered with respect to structural details, which may be susceptible to buckling or cracking as a result of vibration, high stress levels or fatigue.

**3.1.4** Corrosion is related to the ageing process, and is closely connected with the quality of corrosion prevention systems fitted at new building, and subsequent maintenance during the service life. Corrosion may also lead to cracking and/or buckling.

#### 3.2 Methods

#### **3.2.1** Design details

**3.2.1.1** Damage experience related to the ship in question and sister and/or similar ships, where available, is the main source of information to be used in the process of planning. In addition, a selection of structural details from the design drawings is to be included.

**3.2.1.2** Typical damage experience to be considered will consist of:

- .1 number, extent, location and frequency of cracks; and
- .2 location of buckles.

**3.2.1.3** This information may be found in the survey reports and/or the owner's files, including the results of the owner's own inspections. The defects should be analysed, noted and marked on sketches.

**3.2.1.4** In addition, general experience should be utilized. Also, reference should be made to reference 2, which contains a catalogue of typical damages and proposed repair methods for various structural details on single skin bulk carriers. Reference should also be made to reference 3, which contains catalogues of typical damages and proposed repair methods for double hull oil tanker structural details which may to some extent be similar to structural details in double skin bulk carriers. Such figures should be used together with a review of the main drawings, in order to compare with the actual structure and search for similar details that may be susceptible to damage. In particular, chapter 3 of reference 3 deals with various aspects specific to double hull tankers, such as stress concentration locations, misalignment during construction, corrosion trends, fatigue considerations and areas requiring special attention, while chapter 4 of reference 3 addresses experience gained on structural defects in double hulls (chemical tankers, OBO carriers, ore/oil carriers, gas carriers), which should also be considered in working out the survey planning.

**3.2.1.5** The review of the main structural drawings, in addition to using the above-mentioned figures, should include checking for typical design details where cracking has been experienced. The factors contributing to damage should be carefully considered.

**3.2.1.6** The use of high-tensile steel (HTS) is an important factor. Details showing good service experience where ordinary, mild steel has been used may be more susceptible to damage when HTS, and its higher associated stresses, are utilized. There is extensive and, in general, good experience, with the use of HTS for longitudinal material in deck and bottom structures. Experience in other locations, where the dynamic stresses may be higher, is less favourable, e.g., side structures.

**3.2.1.7** In this respect, stress calculations of typical and important components and details, in accordance with relevant methods, may prove useful and should be considered.

**3.2.1.8** The selected areas of the structure identified during this process should be recorded and marked on the structural drawings to be included in the Survey Programme.

3.2.2 Corrosion

**3.2.2.1** In order to evaluate relative corrosion risks, the following information should generally be considered:

- .1 usage of tanks, holds and spaces;
- .2 condition of coatings;

- .3 cleaning procedures;
- .4 previous corrosion damage;
- .5 ballast use and time for cargo holds;
- .6 risk of corrosion in cargo holds and ballast tanks; and
- .7 location of ballast tanks adjacent to heated fuel oil tanks.

**3.2.2.2** Reference 4 gives definitive examples which can be used for judging and describing coating condition, using typical pictures of conditions.

**3.2.2.3** The evaluation of corrosion risks should be based on information in both reference 2 and reference 4, as far as applicable to double-side skin construction, together with relevant information on the anticipated condition of the ship as derived from the information collected in order to prepare the Survey Programme and the age of the ship. The various holds, tanks and spaces should be listed with the corrosion risks nominated accordingly.

**3.2.3** Locations for close-up survey and thickness measurement

**3.2.3.1** On the basis of the table of corrosion risks and the evaluation of design experience, the locations for initial close-up survey and thickness measurement (areas and sections) may be nominated.

**3.2.3.2** The sections subject to thickness measurement should normally be nominated in tanks, holds and spaces where corrosion risk is judged to be the highest.

**3.2.3.3** The nomination of tanks, holds and spaces for close-up survey should initially be based on highest corrosion risk, and should always include ballast tanks. The principle for the selection should that the extent is increased by age or where information is insufficient or unreliable.



Figure 1 - Technical assessment and the survey planning process

#### ANNEX 10

#### REQUIREMENTS FOR EXTENT OF THICKNESS MEASUREMENTS AT THOSE AREAS OF SUBSTANTIAL CORROSION OF BULK CARRIERS WITH DOUBLE-SIDE SKIN CONSTRUCTION WITHIN THE CARGO LENGTH AREA

#### **TABLE 1 – BOTTOM, INNER BOTTOM AND HOPPER STRUCTURE** Structural member **Extent of measurement Pattern of measurement** Bottom, inner bottom Minimum of three bays across Five-point pattern for each panel and hopper structure double bottom tank, including between longitudinals and floors plating aft bav Measurements around and under all suction bell mouths Bottom, inner bottom Minimum of three longitudinals in Three measurements in line each bay where bottom plating and hopper structure across flange and three longitudinals measured measurements on the vertical web Bottom girders. At fore and aft watertight floors and Vertical line of single including the watertight in centre of tanks measurements on girder plating with one measurement between ones panel stiffener. each or а minimum of three measurements Bottom floors, Three floors in the bays where Five-point pattern over two including the watertight bottom plating measured, square metre area with measurements at both ends and ones middle Hopper structure web Three floors in bays where bottom Five-point pattern over one frame ring plating measured square metre of plating Single measurements on flange Hopper structure lower 1/3 of bulkhead - five-point pattern over one transverse watertight square metre of plating bulkhead or swash bulkhead five-point pattern over two - upper 2/3 of bulkhead square metre of plating - For web, five-point pattern - stiffeners (minimum of three) over span (two measurements across web at each end and one at centre of span). For flange, single measurements at each end and centre of span Panel stiffening Where applicable Single measurements

# TABLE 2 – DECK STRUCTURE INCLUDING CROSS STRIPS, MAIN CARGOHATCHWAYS, HATCH COVERS, COAMINGS AND TOPSIDE TANKS

Structural member	Extent of measurement	Pattern of measurement
Cross deck strip plating	Suspect cross deck strip plating	Five-point pattern between under deck stiffeners over 1 metre length
Under deck stiffeners	Transverse members Longitudinal member	Five-point pattern at each end and mid span Five-point pattern on both web and flange
Hatch covers	Side and end skirts, each three locations Three longitudinal bands, outboard strakes (2) and centreline strake (1)	Five-point pattern at each location Five-point measurement each band
Hatch coamings	Each side and end of coaming, one band lower 1/3, one band upper 2/3 of coaming	Five-point measurement each band i.e., end or side coaming
Topside ballast tanks	<ul> <li>a) watertight transverse bulkheads:</li> <li>Lower 1/3 of bulkhead</li> <li>Upper 2/3 of bulkhead</li> <li>Stiffeners</li> </ul>	Five-point pattern over 1 sq. metre of plating Five-point pattern over 1 sq. metre of plating Five-point pattern over 1 metre length
Topside ballast tanks	<ul> <li>b) two representative swash transverse bulkheads:</li> <li>- Lower 1/3 of bulkhead</li> <li>- Upper 2/3 of bulkhead</li> <li>- Stiffeners</li> </ul>	Five-point pattern over 1 sq. metre of plating Five-point pattern over 1 sq. metre of plating Five-point pattern over 1 metre length
Topside ballast tanks	<ul> <li>c) three representative bays of slope plating:</li> <li>Lower 1/3 of tank</li> <li>Upper 2/3 of tank</li> </ul>	Five-point pattern over 1 sq. metre of plating Five point pattern over 1 sq. metre of plating
Topside ballast tanks	d) Longitudinals, suspect and adjacent	Five point pattern on both web and flange over 1 metre length
Main deck plating	Suspect plates and adjacent (4)	Five-point pattern over 1 sq. metre of plating
Main deck longitudinals	Suspect plates	Five point pattern on both web and flange over 1 metre length
Web frames/transverses	Suspect plates	Five-point pattern over 1 sq. metre

TABLE 3 – STRUCTURE IN DOUBLE-SIDE BALLAST TANKS				
Structural member	Extent of measurement	Pattern of measurement		
Side shell and inner plating:				
<ul> <li>Upper strake and strakes in way of horizontal girders</li> <li>All other strakes</li> </ul>	<ul> <li>Plating between each pair of transverse frames/longitudinals in a minimum of three bays (along the tank)</li> <li>Plating between every third pair of longitudinals in same three bays</li> </ul>	<ul> <li>Single measurement</li> <li>Single measurement</li> </ul>		
Side shell and inner side transverse frames/ longitudinals on:				
<ul> <li>upper strake</li> <li>all other strakes</li> </ul>	<ul> <li>Each transverse frame/ longitudinal in same three bays</li> <li>Every third transverse frame/ longitudinal in same three bays</li> </ul>	<ul> <li>Three measurements across web and 1 measurement on flange</li> <li>Three measurements across web and 1 measurement on flange</li> </ul>		
Transverse frames/ longitudinals: – brackets	Minimum of three at top, middle and bottom of tank in same three bays	Five-point pattern over area of bracket		
Vertical web and transverse bulkheads:				
<ul> <li>strakes in a way of horizontal girders</li> <li>other strakes</li> </ul>	<ul> <li>Minimum of two webs and both transverse bulkheads</li> <li>Minimum of two webs and both transverse bulkheads</li> </ul>	<ul> <li>Five-point pattern over approx. two square metre area</li> <li>Two measurements between each pair of vertical stiffeners</li> </ul>		
Horizontal girders	Plating on each girder in a minimum of three bays	Two measurements between each pair of longitudinal girder stiffeners		
Panel stiffening	Where applicable	Single measurements		

TABLE 4 – TRANSVERSE BULKHEADS IN CARGO HOLDS				
Structural member	Extent of measurement	Pattern of measurement		
Lower stool, where fitted	<ul> <li>Transverse band within 25 mm of welded connection to inner bottom</li> <li>Transverse bands within 25 mm of welded connection to shelf plate</li> </ul>	<ul> <li>Five-point pattern between stiffeners over one metre length</li> <li>Five-point pattern between stiffeners over one metre length</li> </ul>		
Transverse bulkheads	<ul> <li>Transverse band at approximately mid height</li> <li>Transverse band at part of bulkhead adjacent to upper deck or below upper stool shelf plate (for those ships fitted with upper stools)</li> </ul>	<ul> <li>Five-point pattern over one square metre of plating</li> <li>Five-point pattern over one square metre of plating</li> </ul>		

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#### ANNEX 11

#### STRENGTH OF CARGO HATCH COVER SECURING ARRANGEMENTS FOR BULK CARRIERS

#### **1** Securing devices

The strength of securing devices should comply with the following requirements:

- .1 Panel hatch covers should be secured by appropriate devices (bolts, wedges or similar) suitably spaced alongside the coamings and between cover elements. Arrangement and spacing should be determined with due attention to the effectiveness for weather-tightness, depending upon the type and the size of the hatch cover, as well as on the stiffness of the cover edges between the securing devices.
- .2 The net sectional area of each securing device is not to be less than:

$$A = 1.4 a / f (cm^2)$$

where:

- a = spacing between securing devices not to be taken less than 2 metres f =  $(\sigma_Y/235)^e$
- $\sigma_{\rm Y}$  = specified minimum upper yield stress in N/mm<sup>2</sup> of the steel used for fabrication, not to be taken greater than 70% of the ultimate tensile strength

e = 0.75 for 
$$\sigma_{\rm Y} > 235$$
  
= 1.0 for  $\sigma_{\rm Y} \le 235$ 

Rods or bolts should have a net diameter not less than 19 mm for hatchways exceeding 5  $m^2$  in area.

- .3 Between cover and coaming and at cross-joints, a packing line pressure sufficient to obtain weathertightness should be maintained by the securing devices. For packing line pressures exceeding 5 N/mm, the cross section area should be increased in direct proportion. The packing line pressure should be specified.
- .4 The cover edge stiffness should be sufficient to maintain adequate sealing pressure between securing devices. The moment of inertia, I, of edge elements be less than:

$$I = 6 p a^4 (cm^4)$$

where:

- p = packing line pressure in N/mm, minimum 5 N/mm
- a = spacing in m of securing devices

- .5 Securing devices should be of reliable construction and securely attached to the hatchway coamings, decks or covers. Individual securing devices on each cover are to have approximately the same stiffness characteristics.
- .6 Where rod cleats are fitted, resilient washers or cushions should be incorporated.
- .7 Where hydraulic cleating is adopted, a positive means should be provided to ensure that it remains mechanically locked in the closed position in the event of failure of the hydraulic system.

#### 2 Stoppers

**2.1** Nos.1 and 2 hatch covers should be effectively secured, by means of stoppers, against the transverse forces arising from a pressure of  $175 \text{ kN/m}^2$ .

**2.2** No.2 hatch covers should be effectively secured, by means of stoppers, against the longitudinal forces acting on the forward end arising from a pressure of  $175 \text{ kN/m}^2$ .

**2.3** No.1 hatch cover should be effectively secured, by means of stoppers, against the longitudinal forces acting on the forward end arising from a pressure of 230 kN/m<sup>2</sup>. This pressure may be reduced to  $175 \text{ kN/m}^2$  if a forecastle is fitted.

**2.4** The equivalent stress in stoppers and their supporting structures and calculated in the throat of the stopper welds is not to exceed the allowable value of  $0.8 \sigma_{Y}$ .

#### 3 Materials and welding

Where stoppers or securing devices are fitted to comply with this annex, they should be manufactured of materials, including welding electrodes, to the satisfaction of the Administration.

#### ANNEX 12

#### PROCEDURAL REQUIREMENTS FOR THICKNESS MEASUREMENTS

#### 1 General

Thickness measurements required in the context of hull structural surveys, if not carried out by the society itself should be witnessed by a surveyor. The attendance of the surveyor should be recorded. This also applies to thickness measurements taken during voyages.

#### 2 Survey meeting

**2.1** Prior to commencement of the renewal or intermediate survey, a meeting should be held between the attending surveyor(s), the owner's representative(s) in attendance and the thickness measurement firm's representative(s) so as to ensure the safe and efficient execution of the surveys and thickness measurements to be carried out on board.

**2.2** Communication with the thickness measurement operator(s) and owner's representative(s) should be agreed during the meeting, with respect to the following:

- .1 reporting of thickness measurements on regular basis;
- .2 prompt notification to the surveyor in case of findings such as:
  - **.2.1** excessive and/or extensive corrosion or pitting/grooving of any significance;
  - .2.2 structural defects like buckling, fractures and deformed structures;
  - .2.3 detached and/or holed structure; and
  - .2.4 corrosion of welds.

**2.3** The survey report should indicate where and when the meeting took place and who attended (the name of the surveyor(s), the owner's representative(s) and the thickness measurement firm's representative(s)).

#### 3 Monitoring of the thickness measurement process onboard

**3.1** The surveyor should decide final extent and location of thickness measurements after overall survey of representative spaces onboard.

**3.2** In case the owner prefers to commence the thickness measurements prior to the overall survey, then the surveyor should advise that the planned extent and locations of thickness measurements are subject to confirmation during the overall survey. Based on findings, the surveyor may require additional thickness measurements to be taken.

**3.3** The surveyor should direct the gauging operation by selecting locations such that readings taken represent, on average, the condition of the structure for that area.

**3.4** Thickness measurements taken mainly to evaluate the extent of corrosion, which may affect the hull girder strength, should be carried out in a systematic manner such that all longitudinal structural members are gauged, as required.

**3.5** Where thickness measurements indicate substantial corrosion or wastage in excess of allowable diminution, the surveyor should direct locations for additional thickness measurements in order to delineate areas of substantial corrosion and to identify structural members for repairs/renewals.

**3.6** Thickness measurements of structures in areas where close-up surveys are required should be carried out simultaneously with close-up survey.

#### 4 **Review and verification**

**4.1** Upon completion of the thickness measurements, the surveyor should confirm that no further gaugings are needed, or specify additional gaugings.

**4.2** Where these guidelines allow the extent of thickness measurements to be reduced after special considerations by the surveyor, these special considerations should be reported, where appropriate.

**4.3** In case thickness measurements are partly carried out, the extent of remaining thickness measurements should be reported for the use of the next surveyor."

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#### ANNEX 8

#### RESOLUTION MSC.262(84) (adopted on 16 May 2008)

#### ADOPTION OF AMENDMENTS TO THE INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) 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.122(75) by which it adopted the International Maritime Dangerous Goods Code (hereinafter referred to as "the IMDG Code"), which has become mandatory under chapter VII of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended (hereinafter referred to as "the Convention"),

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

HAVING CONSIDERED, at its eighty-fourth session, amendments to the IMDG 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 IMDG Code, the text of which is set out in the Annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2009, 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% 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 2010 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 2009;

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. FURTHER 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 MARITIME DANGEROUS GOODS (IMDG) CODE

**Contents** Delete the comma after the word "goods" in 4.1.1

Preamble Paragraph 9 Add "MEPC adopted resolution MEPC.156(55), a revised text to take into account the GHS criteria" after "... entered into force in 1994, 1996 and 2002"

#### PART 1

#### Chapter 1.1

- **1.1.1.5.1** Replace "chapter 1.3" with "paragraphs 1.3.1.4 to 1.3.1.7"
- 1.1.1.5.2 Replace "will be" with "is"
- **1.1.1.5.8** Replace "(Contact information of competent authorities)" with "(Contact information for the main designated national competent authorities)"
- **1.1.2.2.1** Replace **Footnote** with "The revised text of Annex III was adopted by resolution MEPC.156(55) and will enter into force on 1 January 2010, which is the mandatory entry into force date of amendment 34-08 to the IMDG Code"
- **1.1.2.2.1** Replace the text of MARPOL Annex III with:

#### "Annex III

*Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form* 

#### **Regulation 1**

Application

- 1 Unless expressly provided otherwise, the regulations of this annex apply to all ships carrying harmful substances in packaged form.
  - .1 For the purpose of this annex, "harmful substances" are those substances which are identified as marine pollutants in the International Maritime Dangerous Goods Code (IMDG Code)<sup>\*</sup> or which meet the criteria in the Appendix of this annex.

<sup>\*</sup> Refer to the IMDG Code adopted by the Organization by resolution MSC.122(75), as amended.

- .2 For the purposes of this annex, "packaged form" is defined as the forms of containment specified for harmful substances in the IMDG Code.
- 2 The carriage of harmful substances is prohibited, except in accordance with the provisions of this annex.
- 3 To supplement the provisions of this Annex, the Government of each Party to the Convention shall issue, or cause to be issued, detailed requirements on packing, marking, labelling, documentation, stowage, quantity limitations and exceptions for preventing or minimizing pollution of the marine environment by harmful substances.<sup>\*</sup>
- 4 For the purposes of this Annex, empty packagings which have been used previously for the carriage of harmful substances shall themselves be treated as harmful substances unless adequate precautions have been taken to ensure that they contain no residue that is harmful to the marine environment.
- 5 The requirements of this annex do not apply to ship's stores and equipment.

#### **Regulation 2**

Packing

Packages shall be adequate to minimize the hazard to the marine environment, having regard to their specific contents.

#### **Regulation 3**

Marking and labelling

- Packages containing a harmful substance shall be durably marked with the correct technical name (trade names alone shall not be used) and, further, shall be durably marked or labelled to indicate that the substance is a marine pollutant. Such identification shall be supplemented where possible by any other means, for example, by use of the relevant United Nations number.
- 2 The method of marking the correct technical name and of affixing labels on packages containing a harmful substance shall be such that this information will still be identifiable on packages surviving at least three months' immersion in the sea. In considering suitable marking and labelling, account shall be taken of the durability of the materials used and of the surface of the package.

<sup>\*</sup> Refer to the specific exemptions provided for in the IMDG Code adopted by resolution MSC.122(75), as amended.

3 Packages containing small quantities of harmful substances may be exempted from the marking requirements.\*

### **Regulation 4**<sup>\*\*</sup>

Documentation

- 1 In all documents relating to the carriage of harmful substances by sea where such substances are named, the correct technical name of each such substance shall be used (trade names alone shall not be used) and the substance further identified by the addition of the words "MARINE POLLUTANT".
- 2 The shipping documents supplied by the shipper shall include, or be accompanied by; a signed certificate or declaration that the shipment offered for carriage is properly packaged and marked, labelled or placarded as appropriate and in proper condition for carriage to minimize the hazard to the marine environment.
- 3 Each ship carrying harmful substances shall have a special list or manifest setting forth the harmful substances on board and the location thereof. A detailed stowage plan which sets out the location of the harmful substances on board may be used in place of such special list or manifest. Copies of such documents shall also be retained on shore by the owner of the ship or his representative until the harmful substances are unloaded. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.
- 4 At any stopover, where any loading or unloading operations, even partial, are carried out, a revision of the documents listing the harmful substances taken on board, indicating their location on board or showing a detailed stowage plan, shall be made available before departure to the person or organization designated by the port State authority.
- 5 When the ship carries a special list or manifest or a detailed stowage plan, required for the carriage of dangerous goods by the International Convention for the Safety of Life at Sea, 1974, as amended, the documents required by this regulation may be combined with those for dangerous goods. Where documents are combined, a clear distinction shall be made between dangerous goods and harmful substances covered by this annex.

<sup>\*</sup> Refer to the specific exemptions provided for in the IMDG Code adopted by resolution MSC.122(75), as amended.

<sup>\*\*</sup> Reference to "documents" in this regulation does not preclude the use of electronic data processing (EDP) and electronic data interchange (EDI) transmission techniques as an aid to paper documentation.

#### **Regulation 5**

Stowage

Harmful substances shall be properly stowed and secured so as to minimize the hazards to the marine environment without impairing the safety of the ship and persons on board.

#### **Regulation 6**

Quantity limitations

Certain harmful substances may, for sound scientific and technical reasons, need to be prohibited for carriage or be limited as to the quantity which may be carried aboard any one ship. In limiting the quantity, due consideration shall be given to size, construction and equipment of the ship, as well as the packaging and the inherent nature of the substances.

#### **Regulation 7**

Exceptions

- 1 Jettisoning of harmful substances carried in packaged form shall be prohibited, except where necessary for the purpose of securing the safety of the ship or saving life at sea.
- 2 Subject to the provisions of the present Convention, appropriate measures based on the physical, chemical and biological properties of harmful substances shall be taken to regulate the washing of leakages overboard, provided that compliance with such measures would not impair the safety of the ship and persons on board.

#### **Regulation 8**

Port State control on operational requirements\*

- 1 A ship when in a port or an offshore terminal of another Party is subject to inspection by officers duly authorized by such Party concerning operational requirements under this annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by harmful substances.
- 2 In the circumstances given in paragraph 1 of this regulation, the Party shall take such steps as will ensure that the ship shall not sail until the situation has been brought to order in accordance with the requirements of this annex.
- 3 Procedures relating to the port State control prescribed in article 5 of the present Convention shall apply to this regulation.

<sup>\*</sup> Refer to the Procedures for port State control adopted by the Organization by resolution A.787(19) and amended by resolution A.882(21).

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4 Nothing in this regulation shall be construed to limit the rights and obligations of a Party carrying out control over operational requirements specifically provided for in the present Convention.

,,

#### Appendix to Annex III

## CRITERIA FOR THE IDENTIFICATION OF HARMFUL SUBSTANCES IN PACKAGED FORM

For the purposes of this annex, substances identified by any one of the following criteria are harmful substances<sup>\*</sup>:

Category: Acute 1	
96 hr LC <sub>50</sub> (for fish)	$\leq 1 \text{ mg/l}$
48 hr $EC_{50}$ (for crustacea)	$\leq 1 \text{ mg/l}$ and/or
72 or 96 hr $ErC_{50}$ (for algae or other aquatic plants)	$\leq 1 \text{ mg/l}$

#### **Category: Chronic 1**

 $\begin{array}{ll} 96 \ hr \ LC_{50} \ (for \ fish) & \leq 1 \ mg/l \\ and/or \\ 48 \ hr \ EC_{50} \ (for \ crustacea) & \leq 1 \ mg/l \\ and/or \\ 72 \ or \ 96 \ hr \ ErC_{50} \ (for \ algae \ or \ other \ aquatic \\ plants) & \leq 1 \ mg/l \\ and/or \\ for \ algae \ or \ other \ aquatic \\ s \ degradable \ and/or \ the \ log \ K_{ow} \geq 4 \ (unless \\ the \ experimentally \ determined \ BCF < 500). \end{array}$ 

<sup>&</sup>lt;sup>\*</sup> The criteria are based on those developed by the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS), as amended.

For definitions of acronyms or terms used in this appendix, refer to the relevant paragraphs of the IMDG Code.

**1.1.3** Delete section

Renumber "1.1.4" as "1.1.3"

Renumber "1.1.4.1" as "1.1.3.1"

#### **Consequential amendments:**

- **1.1.3** Replace "Transport of radioactive material" with "Dangerous goods forbidden from transport"
- 1.1.4 Delete
- **2.0.4.2** Replace "1.1.4" with "1.1.3"
- **3.1.2.6** Replace "1.1.4" with "1.1.3"
- **5.1.5.2.3** Replace "1.1.3.4" with "1.5.4"
- **6.4.23.6** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.7** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.8(d)** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.11(i)** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.12(r)** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.13(I)** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.14(t)** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.24(1)** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.24(2)** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.24(3)** Replace "1.1.3.1" with "1.5.3.1"
- **6.4.23.24(4)** Replace "1.1.3.1" with "1.5.3.1"
## Chapter 1.2

#### **1.2.1** *"Competent authority"*

Replace the definition with "*Competent authority* means any body or authority designated or otherwise recognized as such for any purpose in connection with this Code."

#### "Compliance assurance"

Replace "concerning the transport of radioactive material are met in practice; see paragraph 1.1.3.3.2." with "are met in practice."

#### "Freight container"

Delete "For freight containers for the transport of radioactive material, see 2.7.2." Insert new paragraph "For freight containers for the transport of radioactive material a freight container may be used as a packaging. A small freight container is that which has either any overall outer dimension less than 1.5 m, or an internal volume of not more than 3 m<sup>3</sup>. Any other freight container is considered to be a large freight container."

#### *"GHS*"

Replace "first" with "second revised" Replace "ST/SG/AC.10/30/Rev.1" with "ST/SG/AC.10/30/Rev.2"

"Liquids"

Replace "ECE/TRANS/175" in the footnote with "ECE/TRANS/185 (Sales No. E.06.VIII.1)"

#### "Packages"

Replace "*Packages*" with "*Package*" in the title Delete "For packages for radioactive material, see 2.7.2." after "... prepared for transport"

#### "Packaging"

Replace the definition with "*Packaging* means one or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions."

"Quality assurance"

Delete "For radioactive material, see 1.1.3.3.1"

#### "Recycled plastics material"

Insert after the definition "**Note:** ISO 16103:2005 "Packaging – Transport packages for dangerous goods - Recycled plastics material", provides additional guidance on procedures to be followed in approving the use of recycled plastics material."

Insert new definition "Animal material means animal carcasses, animal body parts, or animal foodstuffs;"

Insert new definition "Approval"

*Multilateral approval*, for the transport of class 7 material, means approval by the relevant competent authority of the country of origin of the design or shipment, as applicable, and also, where the consignment is to be transported through or into any other country, approval by the competent authority of that country. The term "through or into" specifically excludes "over", i.e. the approval and notification requirements shall not apply to a country over which radioactive material is carried in an aircraft, provided that there is no scheduled stop in that country.

*Unilateral approval*, for the transport of class 7 material, means an approval of a design which is required to be given by the competent authority of the country of origin of the design only.

Insert new definition "*Confinement system*, for the transport of class 7 material, means the assembly of fissile material and packaging components specified by the designer and agreed to by the competent authority as intended to preserve criticality safety."

Insert new definition "*Containment system*, for the transport of class 7 material, means the assembly of components of the packaging specified by the designer as intended to retain the radioactive material during transport."

Insert new definition "*Criticality safety index (CSI) assigned to a package, overpack or freight container containing fissile material*, for the transport of class 7 material, means a number which is used to provide control over the accumulation of packages, overpacks or freight containers containing fissile material."

Insert new definition "*Design*, for the transport of class 7 material, means the description of special form radioactive material, low dispersible radioactive material, package or packaging which enables such an item to be fully identified. The description may include specifications, engineering drawings, reports demonstrating compliance with regulatory requirements, and other relevant documentation."

Insert new definition "*Exclusive use*, for the transport of class 7 material, means the sole use, by a single consignor, of a conveyance or of a large freight container, in respect of which all initial, intermediate and final loading and unloading is carried out in accordance with the directions of the consignor or consignee."

Insert new definition "*Maximum normal operating pressure*, for the transport of class 7 material, means the maximum pressure above atmospheric pressure at mean sea-level that would develop in the containment system in a period of one year under the conditions of temperature and solar radiation corresponding to environmental conditions in the absence of venting, external cooling by an ancillary system, or operational controls during transport."

Insert new definition "*Radiation level*, for the transport of class 7 material, means the corresponding dose rate expressed in millisieverts per hour."

Insert new definition "*Radioactive contents*, for the transport of class 7 material, mean the radioactive material together with any contaminated or activated solids, liquids, and gases within the packaging."

Insert new definition "*Transport index (TI) assigned to a package, overpack or freight container, or to unpackaged LSA-I or SCO-I*, for the transport of class 7 material, means a number which is used to provide control over radiation exposure."

- **1.2.2.2** Replace "Whenever the word "weight" is used, it means "mass"." with "(Reserved)".
- **1.2.3** Delete "GESAMP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (IMO/FAO/UNESCOIOC/WMO/WHO/IAEA/UN/UNEP)".

## Chapter 1.3

- **1.3.0** Replace "this chapter remain recommendatory." with "paragraphs 1.3.1.4 to 1.3.1.7 remain recommendatory."
- **1.3.1.1** Replace "should" with "shall"

Insert second paragraph "Entities engaging shore-based personnel in such activities shall determine which staff will be trained, what levels of training they require and the training methods used to enable them to comply with the provisions of the IMDG Code. This training shall be provided or verified upon employment in a position involving dangerous goods transport. For personnel who have not yet received the required training, the entities shall ensure that those personnel may only perform functions under the direct supervision of a trained person. The training shall be periodically supplemented with refresher training to take account of changes in regulations and practice. The competent authority, or its authorized body, may audit the entity to verify the effectiveness of the system in place, in providing training of staff commensurate with their role and responsibilities in the transport chain."

**1.3.1.2** Replace "pack dangerous goods in packages" with "pack dangerous goods"

Replace "pack/unpack CTUs" with "load/unload Cargo Transport Units"

Replace "should" with "shall"

- **1.3.1.2.1.1** Replace "should" with "shall"
- **1.3.1.2.1.2** Replace "should" with "shall"

**1.3.1.2.2** Replace "should" with "shall"

Insert "An indicative list for guidance purposes only of some of the functions typically found in dangerous goods transport operations by sea and training requirements is given in paragraph 1.3.1.6."

- **1.3.1.2.3** Delete paragraph
- **1.3.1.3** Replace paragraph with "Details of all the training undertaken shall be kept by both the employer and the employee. Training records shall be made available to the competent authority if requested."
- **1.3.1.4** Replace paragraph with "*Safety training*: Commensurate with the risk of exposure in the event of a release and the functions performed, each person should receive training on:
  - .1 methods and procedures for accident avoidance, such as proper use of package-handling equipment and appropriate methods of stowage of dangerous goods;
  - .2 available emergency response information and how to use it;
  - .3 general dangers presented by the various classes of dangerous goods and how to prevent exposure to those hazards, including, if appropriate, the use of personal protective clothing and equipment; and
  - .4 immediate procedures to be followed in the event of an unintentional release of dangerous goods, including any emergency response procedures for which the person is responsible and personal protection procedures to be followed."
- **1.3.1.5** Insert new paragraph before the table "The following indicative table is for information purposes only as every entity is arranged differently and may have varied roles and responsibilities within that entity."

Delete "in packages" in line 2 – Function

Insert "and excepted quantities" after "limited quantities" in line 2 – Specific training requirements

Insert "and excepted quantities" after "limited quantities" in line 3 – Specific training requirements

Replace "Pack/unpack" with "Load/unload" in line 4 - Function

**1.3.1.6** Replace title with "Indicative table describing sections of the IMDG Code or other relevant instruments that may be appropriate to be considered in any training for the transport of dangerous goods"

Replace "Guidelines for Packing Cargo Transport Units" with "Guidelines for Packing of Cargo Transport Units"

Replace "Pack/unpack" with "Load/unload" in line 4 - Function

- **Remarks:** Insert "." after "apply"
- **1.3.1.7** Insert "which may be appropriate" after "publications"
- **1.3.1.7.10** Replace "The Recommendations on the Safe Use of Pesticides in Ships, as amended" with "MSC/Circ. [...] Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units"

## Chapter 1.4

- **1.4.3.1** Insert "Class 1 Division 1.4. UN Nos. 0104, 0237, 0255, 0267, 0289, 0361, 0365, 0366, 0440, 0441, 0455, 0456 and 0500" after "Class 1 Division 1.3 compatibility group C explosives"
- Class 5.1 Replace "and ammonium nitrate fertilizers" with ", ammonium nitrate fertilizers and ammonium nitrate emulsions or suspensions or gels"

## Chapter 1.5

Insert new Chapter 1.5:

## "Chapter 1.5

## **General provisions concerning class 7**

- **1.5.1** Scope and application
- **1.5.1.1** The provisions of this Code establish standards of safety which provide an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment that are associated with the transport of radioactive material. These provisions are based on the IAEA Regulations for the Safe Transport of Radioactive Material (2005 Edition), Safety Standards Series No. TS-R-1, IAEA, Vienna (2005). Explanatory material on the 1996 edition of TS-R-1 can be found in "Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material<sup>1</sup>", Safety Standard Series No. TS-G-1.1 (ST-2), IAEA, Vienna (2002).
- **1.5.1.2** The objective of the provisions of this Code is to protect persons, property and the environment from the effects of radiation during the transport of radioactive material. This protection is achieved by requiring:

<sup>&</sup>lt;sup>1</sup> A revised edition containing explanatory material on the 2005 edition of TS-R-1 is likely to be published by IAEA in 2008.

- .1 containment of the radioactive contents;
- .2 control of external radiation levels;
- .3 prevention of criticality; and
- .4 prevention of damage caused by heat.

These provisions are satisfied firstly by applying a graded approach to contents limits for packages and conveyances and to performance standards applied to package designs depending upon the hazard of the radioactive contents. Secondly, they are satisfied by imposing requirements on the design and operation of packages and on the maintenance of packagings, including a consideration of the nature of the radioactive contents. Finally, they are satisfied by requiring administrative controls including, where appropriate, approval by competent authorities.

- **1.5.1.3** The provisions of this Code apply to the transport of radioactive material by sea including transport which is incidental to the use of the radioactive material. Transport comprises all operations and conditions associated with and involved in the movement of radioactive material; these include the design, manufacture, maintenance and repair of packaging, and the preparation, consigning, loading, transport including in-transit storage, unloading and receipt at the final destination of loads of radioactive material and packages. A graded approach is applied to the performance standards in the provisions of this Code that is characterized by three general severity levels:
  - .1 routine conditions of transport (incident free);
  - .2 normal conditions of transport (minor mishaps); and
  - .3 accident conditions of transport.
- **1.5.1.4** The provisions of this Code shall not apply to:
  - .1 radioactive material that is an integral part of the means of transport;
  - .2 radioactive material moved within an establishment which is subject to appropriate safety regulations in force in the establishment and where the movement does not involve public roads or railways;
  - .3 radioactive material implanted or incorporated into a person or live animal for diagnosis or treatment;
  - .4 radioactive material in consumer products which have received regulatory approval, following their sale to the end user;

- .5 natural material and ores containing naturally occurring radionuclides which are either in their natural state, or have only been processed for purposes other than for extraction of the radionuclides, and which are not intended to be processed for use of these radionuclides provided the activity concentration of the material does not exceed 10 times the values specified in 2.7.2.2.1.2, or calculated in accordance with 2.7.2.2.2 to 2.7.2.2.6; and
- .6 non-radioactive solid objects with radioactive substances present on any surfaces in quantities not in excess of the limit set out in the definition for "contamination" in 2.7.1.2.
- **1.5.1.5** Specific provisions for the transport of excepted packages
- **1.5.1.5.1** Excepted packages which may contain radioactive material in limited quantities, instruments, manufactured articles and empty packagings as specified in 2.7.2.4.1 may be transported under the following conditions:
  - .1 the applicable provisions specified in 2.0.3.5, 2.7.2.4.1.2 to 2.7.2.4.1.6 (as applicable), 4.1.9.1.2, 5.2.1.1, 5.2.1.2, 5.2.1.5.1 to 5.2.1.5.3, 5.4.1.4.1.1 and 7.3.4.2;
  - .2 the provisions for excepted packages specified in 6.4.4; and
  - .3 if the excepted package contains fissile material, one of the fissile exceptions provided by 2.7.2.3.5 shall apply and the provision of 6.4.7.2 shall be met.
- **1.5.1.5.2** The following provisions shall not apply to excepted packages and the controls for transport of excepted packages: 1.4.2, 1.4.3, 2.7.2.3.3.1.1, 2.7.2.3.3.2, 4.1.9.1.3, 4.1.9.1.4, 4.1.9.1.6, 4.1.9.1.7, 5.1.3.2, 5.2.2.1.12.1, 5.4.1.5.7.1, 5.4.1.5.7.2, 5.4.1.6, 6.4.6.1, 7.1.14.11 to 7.1.14.14, 7.2.9.1, 7.2.9.2, 7.2.1 and 7.3.4.1.

## **1.5.2** Radiation protection programme

- **1.5.2.1** The transport of radioactive material shall be subject to a radiation protection programme which shall consist of systematic arrangements aimed at providing adequate consideration of radiation protection measures.
- **1.5.2.2** Doses to persons shall be below the relevant dose limits. Protection and safety shall be optimized in order that the magnitude of individual doses, the number of persons exposed, and the likelihood of incurring exposure shall be kept as low as reasonably achievable, economic and social factors being taken into account, within the restrictions that the doses to individual be subject to dose constraints. A structured and systematic approach shall be adopted and shall include consideration of the interfaces between transport and other activities.

- **1.5.2.3** The nature and extent of the measures to be employed in the programme shall be related to the magnitude and likelihood of radiation exposures. The programme shall incorporate the provisions in 1.5.2.2, 1.5.2.4 to 1.5.2.7. Programme documents shall be available, on request, for inspection by the relevant competent authority.
- **1.5.2.4** For occupational exposures arising from transport activities, where it is assessed that the effective dose:
  - .1 is likely to be between 1 and 6 mSv in a year, a dose assessment programme via workplace monitoring or individual monitoring shall be conducted;
  - .2 is likely to exceed 6 mSv in a year, individual monitoring shall be conducted.

When individual monitoring or workplace monitoring is conducted, appropriate records shall be kept.

**Note:** For occupational exposures arising from transport activities, where it is assessed that the effective dose is most unlikely to exceed 1 mSv in a year, no special work patterns, detailed monitoring, dose assessment programmes or individual record keeping need be required.

## 1.5.3 Quality assurance

- **1.5.3.1** Quality assurance programmes based on international, national or other standards acceptable to the competent authority shall be established and implemented for the design, manufacture, testing, documentation, use, maintenance and inspection of all special form radioactive material, low dispersible radioactive material and packages and for transport and in-transit storage operations to ensure compliance with the relevant provisions of this Code. Certification that the design specification has been fully implemented shall be available to the competent authority. The manufacturer, consignor or user shall be prepared to provide facilities for competent authority inspection during manufacture and use and to demonstrate to any cognizant competent authority that:
  - .1 the manufacturing methods and materials used are in accordance with the approved design specifications; and
  - .2 all packagings are periodically inspected and, as necessary, repaired and maintained in good condition so that they continue to comply with all relevant requirements and specifications, even after repeated use.

Where competent authority approval is required, such approval shall take into account and be contingent upon the adequacy of the quality assurance programme.

## 1.5.4 Special arrangement

- **1.5.4.1** Special arrangement shall mean those provisions, approved by the competent authority, under which consignments which do not satisfy all the provisions of this Code applicable to radioactive material may be transported.
- **1.5.4.2** Consignments for which conformity with any provision applicable to class 7 is impracticable shall not be transported except under special arrangement. Provided the competent authority is satisfied that conformity with the class 7 provisions of this Code is impracticable and that the requisite standards of safety established by this Code have been demonstrated through alternative means the competent authority may approve special arrangement transport operations for single or a planned series of multiple consignments. The overall level of safety in transport shall be at least equivalent to that which would be provided if all the applicable provisions had been met. For international consignments of this type, multilateral approval shall be required.

## **1.5.5** Radioactive material possessing other dangerous properties

**1.5.5.1** In addition to the radioactive and fissile properties, any subsidiary risk of the contents of a package, such as explosiveness, flammability, pyrophoricity, chemical toxicity and corrosiveness, shall also be taken into account in the documentation, packing, labelling, marking, placarding, stowage, segregation and transport, in order to be in compliance with all relevant provisions for dangerous goods. (See also special provision 172 and, for excepted packages, special provision 290.)

## 1.5.6 Non-compliance

- **1.5.6.1** In the event of a non-compliance with any limit in the provisions of this Code applicable to radiation level or contamination,
  - .1 The consignor shall be informed of the non-compliance
    - (i) by the carrier if the non-compliance is identified during transport; or
    - (ii) by the consignee if the non-compliance is identified at receipt;
  - .2 The carrier, consignor or consignee, as appropriate, shall:
    - (i) take immediate steps to mitigate the consequences of the non-compliance;

- (ii) investigate the non-compliance and its causes, circumstances and consequences;
- (iii) take appropriate action to remedy the causes and circumstances that led to the non-compliance and to prevent a recurrence of similar circumstances that led to the non-compliance; and
- (iv) communicate to the relevant competent authority(ies) on the causes of the non-compliance and on corrective or preventive actions taken or to be taken; and
- .3 The communication of the non-compliance to the consignor and relevant competent authority(ies), respectively, shall be made as soon as practicable and it shall be immediate whenever an emergency exposure situation has developed or is developing."

## **Consequential amendments:**

**Contents Page:** 

## Chapter 1.5 Insert "Chapter 1.5 General provisions concerning class 7

- 1.5.1 Scope and application
- 1.5.2 Radiation protection program
- 1.5.3 Quality assurance
- 1.5.4 Special arrangement
- 1.5.5 Radioactive material possessing other dangerous properties
- 1.5.6 Non-compliance"

## PART 2

## Chapter 2.0

- **2.0.1.1** Insert "solid" before "desensitized explosives" for Class 4.1
- **2.0.1.2.1** Replace paragraph with "Many of the substances assigned to classes 1 to 9 are deemed as being marine pollutants (see chapter 2.10)."
- **2.0.1.7** Replace paragraph with "Known marine pollutants are noted in the Dangerous Goods List and are indicated in the Index."
- **2.0.4.1** Replace "GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, UN 3167" with "UN 3167, GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE"

## Chapter 2.1

## **2.1.3.5.5** Replace "Division de risque" with "Classification" (French)

Replace Note 2 with "Note 2: "Flash composition" in this table refers to pyrotechnic compositions in powder form or as pyrotechnic units as presented in the fireworks, that are used to produce an aural effect, or used as a bursting charge or lifting charge, unless the time taken for the pressure rise is demonstrated to be more than 8 ms for 0.5 g of pyrotechnic composition in Test Series 2(c) (i) "Time/pressure test" of the UN Manual of Tests and Criteria."

In the table against "Shell, spherical or cylindrical/Preloaded mortar, shell in mortar" insert new third entry:

Specification	Classification
colour shell: $> 25\%$ flash composition as loose powder	1.1G
and/or report effects	

## Chapter 2.2

- **2.2.2.2** Insert ". The oxidizing ability shall be determined by tests or by calculation in accordance with methods adopted by ISO (see ISO 10156:1996 and ISO 10156-2:2005)" after "... more than air does"
- **2.2.2.5** Replace paragraph with "Gases of class 2.2 are not subject to the provisions of this Code if they are transported at a pressure of less than 200 kPa at 20°C and are not liquefied or refrigerated liquefied gases."
- **2.2.3.4** Insert "(see ISO 10156:1996 and ISO 10156-2:2005)" after "… Organization for Standardization"

## Chapter 2.3

**2.3.2.5** Replace "are not toxic or corrosive;" with "are not toxic, corrosive or environmentally hazardous;"

## Chapter 2.4

- 2.4.2.3.2.4 Insert "the United Nations" before "Manual of Tests and Criteria"
- 2.4.2.4.1.1 Replace "and UN 3380" with ", UN 3380 and UN 3474"

## Chapter 2.5

## **2.5.3.2.4** In the table amend the entries listed below as follows:

Number (generic entry)	Organic peroxide		Column	Amendment
Move this entry from UN 3101 to UN 3105	tert-AMYL PEROXY-3,5,5 -TRIMETHYLHEXANOATE	As fourth entry	Packing method	Replace "OP5" with "OP7"
UN 3103	1,6-DI-( <i>tert</i> -BUTYLPEROXYCARBONYLOXY)-HEXANE		Concentration	Replace "<72" with "≤ 72"
UN 3107	tert-BUTYLHYDROPROXIDE	(English only)	Organic Peroxide	Insert a space between the words "BUTYL" and "HYDROPE ROXIDE"
UN 3107	DI-tert-AMYLPEROXIDE	(English only)	Organic Peroxide	Insert a space between the words "AMYL" and "PEROXIDE"
UN 3108	"n-BUTYL-DI-(BUTYLPEROXY) VALERATE"	(English and French only)	Organic Peroxide	Insert "tert-" before "BUTYLPER OXY) VALERATE"

Number (generic entry)	Organic peroxide		Column	Amendment
UN 3109	2,5-DIMETHYL-2,5-DI( <i>tert</i> -BUTYLPEROXY)-HEXANE		Diluent type B	Move "≥48" from 'Diluent type B' to 'Diluent type A'
UN 3110	DICUMYL PEROXIDE (Concentration > 52-100)		Inert solid	Delete "≤ 48"
UN 3115	DIACETYLPEROXIDE	(English only)	Organic Peroxide	Insert space between "DIACETYL" and "PEROXIDE"
Move this entry from	DI-(2-ETHYLHEXYL) PEROXYDICARBONATE (Concentration $\leq 62$ as a stable dispersion in water)		Number	
UN 3117	1,1-DIMETHYL-3- HYEROXYBUTYLPEROXYNEOHEPTANOATE	(English Only)	Organic Peroxide	Insert space between "HYEROXY BUTYL" and "PEROXYNE OHEPTANO ATE"
UN 3119	DI-(2-ETHYLHEXYL) PEROXYDICARBONATE (Concentration $\leq 52$ as a stable dispersion in water)			Delete the entry

**Note 8** Replace " $\leq 0.7$ %" with " $\leq 10.7$ %" (English only)

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Insert new entries:

Number (generic entry)	Organic peroxide	Concentration (%)	Dilutent type A (%)	Dilutent type B (%)	Insert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3119	tert-AMYL PEROXYNEODECANOATE	<i>≤</i> 47	≥ 53				OP8	0	+ 10	
3106	tert-BUTYL PEROXY 3,5,5- TRIMETHYLHEXANOATE	≤ 42			≥ 58		OP7			
3115	CUMYL PEROXYNEO- DECANOATE	≤ 87	≥13				OP7	- 10	0	
3105	2,2-DI-(tert- AMYLPEROXY)-BUTANE	≤ 57	≥43				OP7			
3103	1,1-DI-(tert- BUTYLPEROXY)- CYCLOHEXANE	≤ 72		≥28			OP5			30)
3105	1,1-DI-(tert- BUTYLPEROXY)- CYCLOHEXANE + tert-BUTYL PEROXY-2- ETHYLHEXANOATE	$\leq$ 43 + $\leq$ 16	≥41				OP 7			
3103	1,1-DI-(tert- BUTYLPEROXY)-3,3,5- TRIMETHYLCYCLOHEXAN E	≤ 90		≥10			OP5			30)
3118	DI-2,4- DICHLOROBENZOYL PEROXIDE	≤ 52 as a paste					OP8	+ 20	+ 25	
3115	3-HYDROXY-1,1- DIMETHYLBUTYL PEROXYNEODECANOATE	≤ 77	≥23				OP 7	- 5	+ 5	

Number (generic entry)	Organic peroxide	Concentration (%)	Dilutent type A (%)	Dilutent type B (%)	Insert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3119	3-HYDROXY-1,1- DIMETHYLBUTYL PEROXYNEODECANOATE	≤ 52 as a stable dispersion in water					OP 8	- 5	+ 5	
3117	3-HYDROXY-1,1- DIMETHYLBUTYL PEROXYNEODECANOATE	≤ 52	≥ 48				OP 8	- 5	+ 5	
3109	METHYL ISOPROPYL KETONE PEROXIDE(S)	See remark 31)	$\geq 70$				OP8			31)
3107	3,3,5,7,7-PENTAMETHYL- 1,2,4-TRIOXEPANE	≤ 100					OP8			

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After the table:

- Insert "(30) Diluent type B with boiling point  $> 130^{\circ}$ C"
- Insert "(31) Active oxygen  $\leq 6.7\%$ ."

## Chapter 2.6

- **2.6.2.1.1** Replace "...for acute oral toxicity..." with "...*for acute oral toxicity*..." (English only)
- **2.6.2.2.3.1** In the second sentence, replace "exhibit" with "exhibits" (English only)
- 2.6.3.2.3.6
- Note: Renumber as Note 1

Insert "in the absence of any concern for infection (e.g., evaluation of vaccine induced immunity, diagnosis of autoimmune disease, etc.)" after "antibody detection in humans or animals"

- **2.6.3.5.2** Insert "For the assignment, international, regional or national waste catalogues may be taken into account." after "… substances shall be assigned to UN 3291"
- **2.6.3.6.2** Replace "Animal carcasses affected by pathogens of category A" with "Animal material affected by pathogens of Category A. Animal material affected by pathogens of Category B other than those which would be assigned to Category A if they were in cultures shall be assigned to UN 3373."

Delete "Other animal carcasses affected by pathogens included in Category B shall be transported in accordance with provisions determined by the competent authority."

## Chapter 2.7

Replace chapter 2.7 with:

## "Chapter 2.7

## Class 7 – Radioactive material

Note: For class 7, the type of packaging may have a decisive effect on classification.

## 2.7.1 Definitions

**2.7.1.1** *Radioactive material* means any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in 2.7.2.2.1 to 2.7.2.2.6.

## **2.7.1.2** *Contamination*

*Contamination* means the presence of a radioactive substance on a surface in quantities in excess of  $0.4 \text{ Bq/cm}^2$  for beta and gamma emitters and low toxicity alpha emitters, or  $0.04 \text{ Bq/cm}^2$  for all other alpha emitters.

*Non-fixed contamination* means contamination that can be removed from a surface during routine conditions of transport.

*Fixed contamination* means contamination other than non-fixed contamination.

## 2.7.1.3 Definitions of specific terms

 $A_1$  and  $A_2$ 

 $A_1$  means the activity value of special form radioactive material which is listed in the Table in 2.7.2.2.1 or derived in 2.7.2.2.2 and is used to determine the activity limits for the provisions of this Code.

 $A_2$  means the activity value of radioactive material, other than special form radioactive material, which is listed in the Table in 2.7.2.2.1 or derived in 2.7.2.2.2 and is used to determine the activity limits for the provisions of this Code.

*Fissile material* means uranium-233, uranium-235, plutonium-239, plutonium-241, or any combination of these radionuclides. Excepted from this definition is:

- .1 Natural uranium or depleted uranium which is unirradiated; and
- .2 Natural uranium or depleted uranium which has been irradiated in thermal reactors only.

*Low dispersible radioactive material* means either a solid radioactive material or a solid radioactive material in a sealed capsule, that has limited dispersibility and is not in powder form.

*Low specific activity (LSA) material* means radioactive material which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply. External shielding materials surrounding the LSA material shall not be considered in determining the estimated average specific activity.

*Low toxicity alpha emitters* are: natural uranium; depleted uranium; natural thorium; uranium-235 or uranium-238; thorium-232; thorium-228 and thorium-230 when contained in ores or physical and chemical concentrates; or alpha emitters with a half-life of less than 10 days.

*Specific activity of a radionuclide* means the activity per unit mass of that nuclide. The specific activity of a material shall mean the activity per unit mass of the material in which the radionuclides are essentially uniformly distributed.

Special form radioactive material means either:

- .1 An indispersible solid radioactive material; or
- .2 A sealed capsule containing radioactive material.

*Surface contaminated object (SCO)* means a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces.

*Unirradiated thorium* means thorium containing not more than  $10^{-7}$  g of uranium-233 per gram of thorium-232.

*Unirradiated uranium* means uranium containing not more than  $2 \times 10^3$  Bq of plutonium per gram of uranium-235, not more than  $9 \times 10^6$  Bq of fission products per gram of uranium-235 and not more than  $5 \times 10^{-3}$  g of uranium-236 per gram of uranium-235.

*Uranium – natural, depleted, enriched* means the following:

*Natural uranium* means uranium (which may be chemically separated) containing the naturally occurring distribution of uranium isotopes (approximately 99.28% uranium-238, and 0.72% uranium-235 by mass).

*Depleted uranium* means uranium containing a lesser mass percentage of uranium-235 than in natural uranium.

*Enriched uranium* means uranium containing a greater mass percentage of uranium-235 than 0.72%.

In all cases, a very small mass percentage of uranium-234 is present.

## 2.7.2 Classification

## 2.7.2.1 General provisions

**2.7.2.1.1** Radioactive material shall be assigned to one of the UN number specified in Table 2.7.2.1.1 depending on the activity level of the radionuclides contained in a package, the fissile or non-fissile properties of these radionuclides, the type of package to be presented for transport, and the nature or form of the contents of the package, or special arrangements governing the transport operation, in accordance with the provisions laid down in 2.7.2.2 to 2.7.2.5.

Table 2.7.2.1.	Assignment of UN numbers
Excepted pack	kages
(1.5.1.5)	
UN 2908	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – EMPTY PACKAGING
UN 2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – ARTICLES
	MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or
	NATURAL THORIUM
UN 2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – LIMITED QUANTITY OF
	MATERIAL
UN 2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – INSTRUMENTS or
	ARTICLES
Low specific a	ctivity radioactive material
(2.7.2.3.1)	
UN 2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-1), non-fissile or
	fissile-excepted
UN 3321	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY
	(LSA-II), non fissile of fissile-excepted
UN 3322	(LSA, III) non figuile or figuile executed
LINI 2224	(LSA-III), non instite of institu-excepted DADIOACTIVE MATERIAL LOW SPECIFIC ACTIVITY
UN 3324	(I SA II) FISSII E
UN 3325	RADIOACTIVE MATERIAL LOW SPECIFIC ACTIVITY
011 3323	(I SA-III) FISSILE
Surface conta	minated objects
(2.7.2.3.2)	
UN 2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or
	SCO-II), non-fissile or fissile-excepted
UN 3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or
	SCO-II), FISSILE
Type A packa	ges
(2.7.2.4.4)	
UN 2915	RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non-fissile or
	fissile-excepted
UN 3327	RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE, non-special form
UN 3332	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, non fissile or
	fissile-excepted
UN 3333	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE

Table 2.7.2.1.1	Assignment of UN numbers
Type B(U) pa	ckage
(2.7.2.4.6)	
UN 2916	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, non-fissile or fissile-excepted
UN 3328	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE
Type B(M) pa	ckage
(2.7.2.4.6)	
UN 2917	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, non-fissile or fissile-excepted
UN 3329	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE
Type C packa	ge
(2.7.2.4.6)	
UN 3323	RADIOACTIVE MATERIAL, TYPE C PACKAGE, non fissile or fissile-excepted
UN 3330	RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE
Special arrange	ement
(2.7.2.5)	
UN 2919	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL
	ARRANGEMENT, non-fissile or fissile-excepted
UN 3331	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL
	ARRANGEMENT, FISSILE
Uranium hexaf	luoride
(2.7.2.4.5)	
UN 2977	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE
UN 2978	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or
	fissile-excepted
	fissile-excepted

- **2.7.2.2** *Determination of activity level*
- **2.7.2.2.1** The following basic values for individual radionuclides are given in Table 2.7.2.2.1:
  - .1 A<sub>1</sub> and A<sub>2</sub> in TBq;
  - .2 Activity concentration for exempt material in Bq/g; and
  - .3 Activity limits for exempt consignments in Bq.

#### Table 2.7.2.2.1: Basic radionuclides values for individual radionuclides

Insert existing Table 2.7.7.2.1 with footnotes (a) - (g)

**2.7.2.2.** For individual radionuclides which are not listed in Table 2.7.2.2.1 the determination of the basic radionuclide values referred to in 2.7.2.2.1 shall require multilateral approval. It is permissible to use an A2 value calculated using a dose coefficient for the appropriate lung absorption type as recommended by the International Commission on Radiological Protection, if the chemical forms of each radionuclide under both normal and accident conditions of transport are taken into consideration. Alternatively, the radionuclide values in Table 2.7.2.2.2 may be used without obtaining competent authority approval.

Radioactive contents	A <sub>1</sub>	$\mathbf{A}_2$	Activity concentration for exempt material	Activity limit for exempt consignments
	(TBq)	(TBq)	(Bq/g)	(Bq)
Only beta or gamma emitting nuclides are known to be present	0.1	0.02	$1 \times 10^1$	$1 \times 10^4$
Alpha emitting nuclides but no neutron emitters are known to be present	0.2	9 × 10 <sup>-5</sup>	1 × 10 <sup>-1</sup>	$1 \times 10^3$
Neutron emitting nuclides are known to be present or no relevant data are available	0.001	9 × 10 <sup>-5</sup>	$1 \times 10^{-1}$	$1 \times 10^3$

#### Table 2.7.2.2.2: Basic radionuclide values for unknown radionuclides or mixtures

- **2.7.2.2.3** In the calculations of  $A_1$  and  $A_2$  for a radionuclide not in Table 2.7.2.2.1, a single radioactive decay chain in which the radionuclides are present in their naturally occurring proportions, and in which no daughter nuclide has a half-life either longer than 10 days or longer than that of the parent nuclide, shall be considered as a single radionuclide; and the activity to be taken into account and the  $A_1$  or  $A_2$  value to be applied shall be those corresponding to the parent nuclide of that chain. In the case of radioactive decay chains in which any daughter nuclide has a half-life either longer than 10 days or greater than that of the parent nuclide, the parent and such daughter nuclides shall be considered as mixtures of different nuclides.
- **2.7.2.2.4** For mixtures of radionuclides, the determination of the basic radionuclide values referred to in 2.7.2.2.1 may be determined as follows:

$$\mathbf{X}_m = \frac{l}{\sum_i \frac{f(i)}{X(i)}}$$

where:

- f(i) is the fraction of activity or activity concentration of radionuclide i in the mixture;
- X(i) is the appropriate value of  $A_1$  or  $A_2$ , or the activity concentration for exempt material or the activity limit for an exempt consignment as appropriate for the radionuclide i; and
- $X_m$  is the derived value of  $A_1$  or  $A_2$ , or the activity concentration for exempt material or the activity limit for an exempt consignment in the case of a mixture.

- **2.7.2.2.5** When the identity of each radionuclide is known but the individual activities of some of the radionuclides are not known, the radionuclides may be grouped and the lowest radionuclide value, as appropriate, for the radionuclides in each group may be used in applying the formulae in 2.7.2.2.4 and 2.7.2.4.4. Groups may be based on the total alpha activity and the total beta/gamma activity when these are known, using the lowest radionuclide values for the alpha emitters or beta/gamma emitters, respectively.
- **2.7.2.2.6** For individual radionuclides or for mixtures of radionuclides for which relevant data are not available, the values shown in Table 2.7.2.2.2 shall be used.
- 2.7.2.3 Determination of other material characteristics
- 2.7.2.3.1 Low specific activity (LSA) material
- **2.7.2.3.1.1** (Reserved)
- **2.7.2.3.1.2** LSA material shall be in one of three groups:
  - .1 LSA-I
    - (i) uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides which are intended to be processed for the use of these radionuclides;
    - (ii) Natural uranium, depleted uranium, natural thorium or their compounds or mixtures, providing they are unirradiated and in solid or liquid form;
    - (iii) radioactive material for which the  $A_2$  value is unlimited, excluding material classified as fissile according to 2.7.2.3.5; or
    - (iv) other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration specified in 2.7.2.2.1 to 2.7.2.2.6, excluding material classified as fissile according to 2.7.2.3.5;

## .2 LSA-II

- (i) water with tritium concentration up to 0.8 TBq/l; or
- (ii) other material in which the activity is distributed throughout and the estimated average specific activity

does not exceed  $10^{-4} A_2/g$  for solids and gases, and  $10^{-5} A_2/g$  for liquids;

- .3 LSA-III Solids (e.g., consolidated wastes, activated materials), excluding powders, in which:
  - the radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.);
  - (ii) the radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble matrix, so that, even under loss of packaging, the loss of radioactive material per package by leaching when placed in water for seven days would not exceed 0.1 A<sub>2</sub>; and
  - (iii) the estimated average specific activity of the solid, excluding any shielding material, does not exceed  $2 \times 10^{-3} A_2/g$ .
- **2.7.2.3.1.3** LSA-III material shall be a solid of such a nature that if the entire contents of a package were subjected to the test specified in 2.7.2.3.1.4 the activity in the water would not exceed  $0.1 A_2$ .
- **2.7.2.3.1.4** LSA-III material shall be tested as follows:

A solid material sample representing the entire contents of the package shall be immersed for 7 days in water at ambient temperature. The volume of water to be used in the test shall be sufficient to ensure that at the end of the 7-day test period the free volume of the unabsorbed and unreacted water remaining shall be at least 10% of the volume of the solid test sample itself. The water shall have an initial pH of 6 - 8 and a maximum conductivity of 1 mS/m at 20°C. The total activity of the free volume of water shall be measured following the 7-day immersion of the test sample.

- **2.7.2.3.1.5** Demonstration of compliance with the performance standards in 2.7.2.3.1.4 shall be in accordance with 6.4.12.1 and 6.4.12.2.
- **2.7.2.3.2** Surface contaminated object (SCO)

SCO is classified in one of two groups:

- .1 SCO-I: A solid object on which:
  - (i) the non-fixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed 4 Bq/cm<sup>2</sup> for beta and gamma emitters and low toxicity alpha emitters, or 0.4 Bq/cm<sup>2</sup> for all other alpha emitters;

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- (ii) the fixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $4 \times 10^4 \text{ Bq/cm}^2$  for beta and gamma emitters and low toxicity alpha emitters, or  $4 \times 10^3 \text{ Bq/cm}^2$  for all other alpha emitters; and
- (iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm<sup>2</sup> (or the area of the surface if less than 300 cm<sup>2</sup>) does not exceed 4 x  $10^4$  Bq/cm<sup>2</sup> for beta and gamma emitters and low toxicity alpha emitters, or 4 x  $10^3$  Bq/cm<sup>2</sup> for all other alpha emitters;
- .2 SCO-II: A solid object on which either the fixed or non-fixed contamination on the surface exceeds the applicable limits specified for SCO-I in 2.7.2.3.2.1 above and on which:
  - (i) the non-fixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $400 \text{ Bq/cm}^2$  for beta and gamma emitters and low toxicity alpha emitters, or  $40 \text{ Bq/cm}^2$  for all other alpha emitters;
  - (ii) the fixed contamination on the accessible surface, averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $8 \times 10^5 \text{ Bq/cm}^2$  for beta and gamma emitters and low toxicity alpha emitters, or  $8 \times 10^4 \text{ Bq/cm}^2$  for all other alpha emitters; and
  - (iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed 8 x  $10^5 \text{ Bq/cm}^2$  for beta and gamma emitters and low toxicity alpha emitters, or 8 x  $10^4 \text{ Bq/cm}^2$  for all other alpha emitters.

## 2.7.2.3.3 Special form radioactive material

- 2.7.2.3.3.1
- .1 Special form radioactive material shall have at least one dimension not less than 5 mm.
- .2 When a sealed capsule constitutes part of the special form radioactive material, the capsule shall be so manufactured that it can be opened only by destroying it.
- .3 The design for special form radioactive material requires unilateral approval.

- **2.7.2.3.3.2** Special form radioactive material shall be of such a nature or shall be so designed that if it is subjected to the tests specified in 2.7.2.3.3.4 to 2.7.2.3.3.8, it shall meet the following requirements:
  - .1 It would not break or shatter under the impact, percussion and bending tests 2.7.2.3.3.5.1, 2.7.2.3.3.5.2, 2.7.2.3.3.5.3, or 2.7.2.3.3.6.1 as applicable;
  - .2 It would not melt or disperse in the applicable heat test 2.7.2.3.3.5.4 or 2.7.2.3.3.6.2 as applicable; and
  - .3 The activity in the water from the leaching tests specified in 2.7.2.3.3.7 and 2.7.2.3.3.8 would not exceed 2 kBq; or alternatively for sealed sources, the leakage rate for the volumetric leakage assessment test specified in ISO 9978:1992 "Radiation Protection – Sealed Radioactive Sources – Leakage Test Methods", would not exceed the applicable acceptance threshold acceptable to the competent authority.
- **2.7.2.3.3.3** Demonstration of compliance with the performance standards in 2.7.2.3.3.2 shall be in accordance with 6.4.12.1 and 6.4.12.2.
- **2.7.2.3.3.4** Specimens that comprise or simulate special form radioactive material shall be subjected to the impact test, the percussion test, the bending test, and the heat test specified in 2.7.2.3.3.5 or alternative tests as authorized in 2.7.2.3.3.6. A different specimen may be used for each of the tests. Following each test, a leaching assessment or volumetric leakage test shall be performed on the specimen by a method no less sensitive than the methods given in 2.7.2.3.3.7 for indispersible solid material or 2.7.2.3.3.8 for encapsulated material.
- 2.7.2.3.3.5 The relevant test methods are:
  - .1 Impact test: The specimen shall drop onto the target from a height of 9 m. The target shall be as defined in 6.4.14;
  - .2 Percussion test: The specimen shall be placed on a sheet of lead which is supported by a smooth solid surface and struck by the flat face of a mild steel bar so as to cause an impact equivalent to that resulting from a free drop of 1.4 kg through 1 m. The lower part of the bar shall be 25 mm in diameter with the edges rounded off to a radius of  $(3.0 \pm 0.3)$  mm. The lead, of hardness number 3.5 to 4.5 on the Vickers scale and not more than 25 mm thick, shall cover an area greater than that covered by the specimen. A fresh surface of lead shall be used for each impact. The bar shall strike the specimen so as to cause maximum damage;

- .3 Bending test: The test shall apply only to long, slender sources with both a minimum length of 10 cm and a length to minimum width ratio of not less than 10. The specimen shall be rigidly clamped in a horizontal position so that one half of its length protrudes from the face of the clamp. The orientation of the specimen shall be such that the specimen will suffer maximum damage when its free end is struck by the flat face of a steel bar. The bar shall strike the specimen so as to cause an impact equivalent to that resulting from a free vertical drop of 1.4 kg through 1 m. The lower part of the bar shall be 25 mm in diameter with the edges rounded off to a radius of  $(3.0 \pm 0.3)$  mm;
- .4 Heat test: The specimen shall be heated in air to a temperature of 800°C and held at that temperature for a period of 10 minutes and shall then be allowed to cool.
- **2.7.2.3.3.6** Specimens that comprise or simulate radioactive material enclosed in a sealed capsule may be excepted from:
  - .1 The tests prescribed in 2.7.2.3.3.5.1 and 2.7.2.3.3.5.2 provided the mass of the special form radioactive material:
    - (i) is less than 200 g and they are alternatively subjected to the class 4 impact test prescribed in ISO 2919:1999
       "Radiation protection – Sealed radioactive sources – General requirements and classification"; or
    - (ii) is less than 500 g and they are alternatively subjected to the class 5 impact test prescribed in ISO 2919:1999
       "Radiation protection – Sealed radioactive sources – General requirements and classification"; and
  - .2 The test prescribed in 2.7.2.3.3.5.4 provided they are alternatively subjected to the class 6 temperature test specified in ISO 2919:1999 "Radiation protection Sealed radioactive sources General requirements and classification".
- **2.7.2.3.3.7** For specimens which comprise or simulate indispersible solid material, a leaching assessment shall be performed as follows:
  - .1 The specimen shall be immersed for 7 days in water at ambient temperature. The volume of water to be used in the test shall be sufficient to ensure that at the end of the 7 day test period the free volume of the unabsorbed and unreacted water remaining shall be at least 10% of the volume of the solid test sample itself. The water shall have an initial pH of 6-8 and a maximum conductivity of 1 mS/m at 20°C;

- .2 The water with specimen shall then be heated to a temperature of  $(50 \pm 5)$  °C and maintained at this temperature for 4 hours;
- .3 The activity of the water shall then be determined;
- .4 The specimen shall then be kept for at least 7 days in still air at not less than 30°C and relative humidity not less than 90%;
- .5 The specimen shall then be immersed in water of the same specification as in 2.7.2.3.3.7.1 above and the water with the specimen heated to  $(50 \pm 5)$  °C and maintained at this temperature for 4 hours;
- .6 The activity of the water shall then be determined.
- **2.7.2.3.3.8** For specimens which comprise or simulate radioactive material enclosed in a sealed capsule, either a leaching assessment or a volumetric leakage assessment shall be performed as follows:
  - .1 The leaching assessment shall consist of the following steps:
    - (i) the specimen shall be immersed in water at ambient temperature. The water shall have an initial pH of 6-8 with a maximum conductivity of 1 mS/m at  $20^{\circ}\text{C}$ ;
    - (ii) the water and specimen shall be heated to a temperature of  $(50 \pm 5)$  °C and maintained at this temperature for 4 hours;
    - (iii) the activity of the water shall then be determined;
    - (iv) the specimen shall then be kept for at least 7 days in still air at not less than 30°C and relative humidity of not less than 90%;
    - (v) the process in (i), (ii) and (iii) shall be repeated.
  - .2 The alternative volumetric leakage assessment shall comprise any of the tests prescribed in ISO 9978:1992 "Radiation Protection Sealed radioactive sources Leakage test methods", which are acceptable to the competent authority.

## 2.7.2.3.4 *Low dispersible material*

**2.7.2.3.4.1** The design for low dispersible radioactive material shall require multilateral approval. Low dispersible radioactive material shall be such that the total amount of this radioactive material in a package shall meet the following provisions:

- .1 The radiation level at 3 m from the unshielded radioactive material does not exceed 10 mSv/h;
- .2 If subjected to the tests specified in 6.4.20.3 and 6.4.20.4, the airborne release in gaseous and particulate forms of up to 100  $\mu$ m aerodynamic equivalent diameter would not exceed 100 A<sub>2</sub>. A separate specimen may be used for each test; and
- .3 If subjected to the test specified in 2.7.2.3.1.4 the activity in the water would not exceed 100 A<sub>2</sub>. In the application of this test, the damaging effects of the tests specified in 2.7.2.3.4.1.2 above shall be taken into account.
- **2.7.2.3.4.2** Low dispersible material shall be tested as follows:

A specimen that comprises or simulates low dispersible radioactive material shall be subjected to the enhanced thermal test specified in 6.4.20.3 and the impact test specified in 6.4.20.4. A different specimen may be used for each of the tests. Following each test, the specimen shall be subjected to the leach test specified in 2.7.2.3.1.4. After each test it shall be determined if the applicable provisions of 2.7.2.3.4.1 have been met.

- **2.7.2.3.4.3** Demonstration of compliance with the performance standards in 2.7.2.3.4.1 and 2.7.2.3.4.2 shall be in accordance with 6.4.12.1 and 6.4.12.2.
- **2.7.2.3.5** *Fissile material*

Packages containing fissile radionuclides shall be classified under the relevant entry of table 2.7.2.1.1 for fissile material unless one of the conditions .1 to .4 of this paragraph is met. Only one type of exception is allowed per consignment.

.1 A mass limit per consignment such that:

$$\frac{\text{mass of uranium} - 235(g)}{X} + \frac{\text{mass of other fissile material}(g)}{Y} < 1$$

where X and Y are the mass limits defined in Table 2.7.2.3.5, provided that the smallest external dimension of each package is not less than 10 cm and that either:

- (i) each individual package contains not more than 15 g of fissile material; for unpackaged material, this quantity limitation shall apply to the consignment being carried in or on the conveyance; or
- (ii) the fissile material is a homogeneous hydrogenous solution or mixture where the ratio of fissile nuclides to hydrogen is less than 5% by mass; or
- (iii) there are not more than 5 g of fissile material in any 10 litre volume of material.

Neither beryllium nor deuterium shall be present in quantities exceeding 1% of the applicable consignment mass limits provided in Table 2.7.2.3.5, except for deuterium in natural concentration in hydrogen.

- .2 Uranium enriched in uranium-235 to a maximum of 1% by mass, and with a total plutonium and uranium-233 content not exceeding 1% of the mass of uranium-235, provided that the fissile material is distributed essentially homogeneously throughout the material. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it shall not form a lattice arrangement;
- .3 Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2% by mass, with a total plutonium and uranium-233 content not exceeding 0.002% of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2;
- .4 Packages containing, individually, a total plutonium mass not more than 1 kg, of which not more than 20% by mass may consist of plutonium-239, plutonium-241 or any combination of those radionuclides.

# Table 2.7.2.3.5:Consignment mass limits for exceptions from the requirements for<br/>packages containing fissile material

Fissile material	Fissile material mass (g) mixed with substances having an average hydrogen density less than or equal to water	Fissile material mass (g) mixed with substances having an average hydrogen density greater than water
Uranium-235 (X)	400	290
Other fissile material (Y)	250	180

## 2.7.2.4 Classification of packages or unpacked material

The quantity of radioactive material in a package shall not exceed the relevant limits for the package type as specified below.

## 2.7.2.4.1 Classification as excepted package

- **2.7.2.4.1.1** Packages may be classified as excepted packages if:
  - .1 They are empty packagings having contained radioactive material;
  - .2 They contain instruments or articles in limited quantities;
  - .3 They contain articles manufactured of natural uranium, depleted uranium or natural thorium; or
  - .4 They contain radioactive material in limited quantities.
- **2.7.2.4.1.2** A package containing radioactive material may be classified as an excepted package provided that the radiation level at any point on its external surface does not exceed 5  $\mu$ Sv/h.

#### Table 2.7.2.4.1.2: Activity limits for excepted packages

Physical state of	Instrument	Instruments or article		
contents	Item limits <sup>a</sup>	Package limits <sup>a</sup>	Package limits <sup>a</sup>	
(1)	(2)	(3)	(4)	
Solids				
special form	$10^{-2} A_1$	$A_1$	$10^{-3} A_1$	
other form	$10^{-2} A_2$	$A_2$	$10^{-3} A_2$	
Liquids	$10^{-3} A_2$	$10^{-1} A_2$	$10^{-4} A_2$	
Gases				
Tritium	$2 \times 10^{-2} A_2$	$2 \times 10^{-1} A_2$	$2 \times 10^{-2} A_2$	
special form	$10^{-3} A_1$	$10^{-2} A_1$	$10^{-3} A_1$	
other forms	$10^{-3} A_2$	$10^{-2} A_2$	$10^{-3} A_2$	

- <sup>a</sup> For mixtures of radionuclides, see 2.7.2.2.4 to 2.7.2.2.6.
  - **2.7.2.4.1.3** Radioactive material which is enclosed in or is included as a component part of an instrument or other manufactured article may be classified under UN 2911, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE INSTRUMENTS or ARTICLES provided that:
    - .1 the radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article is not greater than 0.1 mSv/h; and
    - .2 each instrument or manufactured article bears the marking "RADIOACTIVE" except:

- (i) radioluminescent time-pieces or devices;
- (ii) consumer products that either have received regulatory approval according to 1.5.1.4.4 or do not individually exceed the activity limit for an exempt consignment in Table 2.7.2.2.1 (column 5), provided such products are transported in a package that bears the marking "RADIOACTIVE" on an internal surface in such a manner that warning of the presence of radioactive material is visible on opening the package; and
- .3 the active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material shall not be considered to be an instrument or manufactured article); and
- .4 the limits specified in columns 2 and 3 of Table 2.7.2.4.1.2 are met for each individual item and each package, respectively.
- **2.7.2.4.1.4** Radioactive material with an activity not exceeding the limit specified in column 4 of Table 2.7.2.4.1.2, may be classified under UN 2910, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE LIMITED QUANTITY OF MATERIAL provided that:
  - .1 the package retains its radioactive contents under routine conditions of transport; and
  - .2 the package bears the marking "RADIOACTIVE" on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.
- 2.7.2.4.1.5 An empty packaging which had previously contained radioactive material with an activity not exceeding the limit specified in column 4 of Table 2.7.2.4.1.2 may be classified under UN 2908, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE EMPTY PACKAGING, provided that:
  - .1 it is in a well-maintained condition and securely closed;
  - .2 the outer surface of any uranium or thorium in its structure is covered with an inactive sheath made of metal or some other substantial material;
  - .3 the level of internal non-fixed contamination, when averaged over any  $300 \text{ cm}^2$ , does not exceed:
    - (i) 400 Bq/cm<sup>2</sup> for beta and gamma emitters and low toxicity alpha emitters; and

- (ii)  $40 \text{ Bq/cm}^2$  for all other alpha emitters; and
- .4 any labels which may have been displayed on it in conformity with 5.2.2.1.12.1 are no longer visible.
- **2.7.2.4.1.6** Articles manufactured of natural uranium, depleted uranium or natural thorium and articles in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium may be classified under UN 2909, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM, provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

## 2.7.2.4.2 Classification as Low specific activity (LSA) material

Radioactive material may only be classified as LSA material if the conditions of 2.7.2.3.1 and 4.1.9.2 are met.

## 2.7.2.4.3 Classification as Surface contaminated object (SCO)

Radioactive material may be classified as SCO if the conditions of 2.7.2.3.2.1 and 4.1.9.2 are met.

## 2.7.2.4.4 Classification as Type A package

Packages containing radioactive material may be classified as Type A packages provided that the following conditions are met:

Type A packages shall not contain activities greater than the following:

- .1 For special form radioactive material  $-A_1$ ; or
- .2 For all other radioactive material  $-A_2$ .

For mixtures of radionuclides whose identities and respective activities are known, the following condition shall apply to the radioactive contents of a Type A package:

$$\sum_{i} \frac{B(i)}{A_{1}(i)} + \sum_{j} \frac{C(j)}{A_{2}(j)} \le 1$$

where:

- B(i) is the activity of radionuclide i as special form radioactive material;
- $A_1(i)$  is the  $A_1$  value for radionuclide i;

- C (j) is the activity of radionuclide j as other than special form radioactive material; and
- $A_2(j)$  is the  $A_2$  value for radionuclide j.

#### 2.7.2.4.5 *Classification of Uranium hexafluoride*

Uranium hexafluoride shall only be assigned to UN No.2977, RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE, or 2978, RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or fissile-excepted.

- **2.7.2.4.5.1** Packages containing uranium hexafluoride shall not contain:
  - .1 a mass of uranium hexafluoride different from that authorized for the package design;
  - .2 a mass of uranium hexafluoride greater than a value that would lead to an ullage smaller than 5% at the maximum temperature of the package as specified for the plant systems where the package shall be used; or
  - .3 Uranium hexafluoride other than in solid form or at an internal pressure above atmospheric pressure when presented for transport.

#### 2.7.2.4.6 Classification as Type B(U), Type B(M) or Type C packages

- **2.7.2.4.6.1** Packages not otherwise classified in 2.7.2.4 (2.7.2.4.1 to 2.7.2.4.5) shall be classified in accordance with the competent authority approval certificate for the package issued by the country of origin of design.
- **2.7.2.4.6.2** A package may only be classified as a Type B(U) if it does not contain:
  - .1 activities greater than those authorized for the package design;
  - .2 Radionuclides different from those authorized for the package design; or
  - .3 contents in a form, or a physical or chemical state different from those authorized for the package design;

as specified in the certificate of approval.

- **2.7.2.4.6.3** A package may only be classified as a Type B(M) if it does not contain:
  - .1 activities greater than those authorized for the package design;

- .2 Radionuclides different from those authorized for the package design; or
- .3 contents in a form, or a physical or chemical state different from those authorized for the package design,

as specified in the certificate of approval.

- **2.7.2.4.6.4** A package may only be classified as a Type C if it does not contain:
  - .1 activities greater than those authorized for the package design;
  - .2 Radionuclides different from those authorized for the package design; or
  - .3 contents in a form, or physical or chemical state different from those authorized for the package design,

as specified in the certificate of approval.

## 2.7.2.5 Special arrangements

Radioactive material shall be classified as transported under special arrangement when it is intended to be transported in accordance with 1.5.4."

## **Consequential amendments**

## **Contents page:**

2.7.1 to 2.7.10	Delete entries
2.7.1	Insert "2.7.1 Definitions"
2.7.2	Insert "2.7.2 Classification"

Amend all references to renumbered paragraphs of chapter 2.7:

3.3.1 SP290	Replace "2.7.9.1" with "1.5.1.5.1"
4.1.9.2.3.2	Replace "2.7.2" with "2.7.2.3.2"
4.1.9.2.3.3	Replace "2.7.5(a)(i)" with "2.7.2.3.2.1(i)"
5.2.2.1.12.1	Replace "2.7.8.4" with "5.1.5.3.4"
5.2.2.1.12.2.1.1	Replace "2.7.7.2.1" with "2.7.2.2.1"
5.2.2.1.12.2.4	Replace "2.7.6.1.1" with "5.1.5.3.1"
5.2.2.1.12.2.4	Replace "2.7.6.1.2" with "5.1.5.3.2"
6.4.8.8	Replace "2.7.7.2.4 – 2.7.7.2.6" with "2.7.2.2.4 – to 2.7.2.2.6"
6.4.10.3	Replace "2.7.7.2.4 – 2.7.7.2.6" with "2.7.2.2.4 – 2.7.2.2.6"
6.4.12.1	Replace "2.7.3.3, 2.7.3.4, 2.7.4.1, 2.7.4.2, 2.7.10.1 and 2.7.10.2" with
	<i>"</i> 2.7.2.3.1.3 <i>,</i> 2.7.2.3.1.4 <i>,</i> 2.7.2.3.3.1 <i>,</i> 2.7.2.3.3.2 <i>,</i> 2.7.2.3.4.1
	and 2.7.2.3.4.2"

6.4.12.2	Replace "2.7.3.3, 2.7.3.4, 2.7.4.1, 2.7.4.2, 2.7.10.1 and 2.7.10.2" with "2.7.2.3.1.3, 2.7.2.3.1.4, 2.7.2.3.3.1, 2.7.2.3.3.2, 2.7.2.3.4.1 and 2.7.2.3.4.2"
6.4.14	Replace "2.7.4.5" with "2.7.2.3.3.5"
6.4.24.1	Replace "2.7.7" with "2.7.2.2, 2.7.2.4.1, 2.7.2.4.4, 2.7.2.4.5, 2.7.2.4.6
6.4.24.2	and 4.1.9.3 Replace "2.7.7" with "2.7.2.2, 2.7.2.4.1, 2.7.2.4.4, 2.7.2.4.5, 2.7.2.4.6 and 4.1.9.3"
6.4.24.3	Replace "2.7.7" with "2.7.2.2, 2.7.2.4.1, 2.7.2.4.4, 2.7.2.4.5, 2.7.2.4.6 and 4.1.9.3"

## Chapter 2.8

**2.8.2.5.3.2** Replace "corrosion rate on steel" with "corrosion rate on either steel"

Insert "when tested on both materials" after "... test temperature of 55°C"

Insert "**Note:** Where an initial test on either steel or aluminium indicates the substance being tested is corrosive the follow up test on the other metal is not required." after "... part III, Section 37."

#### Chapter 2.9

Replace the heading "Class 9 – Miscellaneous dangerous substances and articles" with "Miscellaneous dangerous substances and articles (Class 9) and environmentally hazardous substances"

Insert after title

"**Note 1:** For the purposes of this Code, the environmentally hazardous substances (aquatic environment) criteria contained in this chapter apply to the classification of marine pollutants (see 2.10).

**Note 2:** Although the environmentally hazardous substances (aquatic environment) criteria apply to all hazard classes (see 2.10.2.3 and 2.10.2.5), the criteria have been included in this chapter."

**2.9.2.1.2** Delete "The properties or characteristics of each substance are given in the Dangerous Goods List in chapter 3.2 pertaining to the substance or article."

Insert:

## **"2.9.3 Environmentally hazardous substances (aquatic environment)**

## 2.9.3.1 General definitions

**2.9.3.1.1** Environmentally hazardous substances include, *inter alia*, liquid or solid substances pollutant to the aquatic environment and solutions and mixtures of such substances (such as preparations and wastes).

For the purposes of this section,

"Substance" means chemical elements and their compounds in the natural state or obtained by any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.

- **2.9.3.1.2** The aquatic environment may be considered in terms of the aquatic organisms that live in the water, and the aquatic ecosystem of which they are part<sup>1</sup>. The basis, therefore, of the identification of hazard is the aquatic toxicity of the substance or mixture, although this may be modified by further information on the degradation and bioaccumulation behaviour.
- **2.9.3.1.3** While the following classification procedure is intended to apply to all substances and mixtures, it is recognized that in some cases, e.g., metals or poorly soluble inorganic compounds, special guidance will be necessary<sup>2</sup>.
- **2.9.3.1.4** The following definitions apply for acronyms or terms used in this section:
  - BCF Bioconcentration Factor;
  - BOD Biochemical Oxygen Demand;
  - COD Chemical Oxygen Demand;
  - GLP Good Laboratory Practices;
  - $EC_{50}$  the effective concentration of substance that causes 50% of the maximum response;
  - $ErC_{50}$   $EC_{50}$  in terms of reduction of growth;
  - K<sub>ow</sub> octanol/water partition coefficient;
  - $LC_{50}$  (50% lethal concentration) the concentration of a substance in water which causes the death of 50% (one half) in a group of test animals;
  - $L(E)C_{50}$  LC<sub>50</sub> or EC<sub>50</sub>;
  - NOEC No Observed Effect Concentration;
  - OECD Test Guidelines Test guidelines published by the Organization for Economic Co-operation and Development (OECD).

<sup>&</sup>lt;sup>1</sup> This does not address aquatic pollutants for which there may be a need to consider effects beyond the aquatic environment such as the impacts on human health, etc.

<sup>&</sup>lt;sup>2</sup> This can be found in annex 10 of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).
### 2.9.3.2 Definitions and data requirements

- **2.9.3.2.1** The basic elements for classification of environmentally hazardous substances (aquatic environment) are:
  - acute aquatic toxicity;
  - potential for or actual bioaccumulation;
  - degradation (biotic or abiotic) for organic chemicals; and
  - chronic aquatic toxicity.
- **2.9.3.2.2** While data from internationally harmonized test methods are preferred, in practice, data from national methods may also be used where they are considered as equivalent. In general, freshwater and marine species toxicity data can be considered as equivalent data and are preferably to be derived using OECD Test Guidelines or equivalent according to the principles of Good Laboratory Practices (GLP). Where such data are not available, classification shall be based on the best available data.
- **2.9.3.2.3** Acute aquatic toxicity shall normally be determined using a fish 96 hour  $LC_{50}$  (OECD Test Guideline 203 or equivalent), a crustacea species 48 hour  $EC_{50}$  (OECD Test Guideline 202 or equivalent) and/or an algal species 72 or 96 hour  $EC_{50}$  (OECD Test Guideline 201 or equivalent). These species are considered as surrogates for all aquatic organisms. Data on other species such as Lemna may also be considered if the test methodology is suitable.
- **2.9.3.2.4** Bioaccumulation means net result of uptake, transformation and elimination of a substance in an organism due to all routes of exposure (i.e. air, water, sediment/soil and food). The potential for bioaccumulation shall normally be determined by using the octanol/water partition coefficient, usually reported as a log  $K_{ow}$  determined according to OECD Test Guideline 107 or 117. While this represents a potential to bioaccumulate, an experimentally determined Bioconcentration Factor (BCF) provides a better measure and shall be used in preference when available. A BCF shall be determined according to OECD Test Guideline 305.
- **2.9.3.2.5** Environmental degradation may be biotic or abiotic (eg. hydrolysis) and the criteria used reflect this fact. Ready biodegradation is most easily defined using the OECD biodegradability tests (OECD Test Guideline 301 (A F)). A pass level in these tests may be considered as indicative of rapid degradation in most aquatic environments. As these are freshwater tests, use of results from OECD Test Guideline 306, which is more suitable for the marine environment, is also included. Where such data are not available, a BOD (5 days)/COD ratio  $\geq 0.5$  is considered as indicative of rapid degradation such as hydrolysis, primary degradation, both abiotic and biotic, degradation in non-aquatic media and proven rapid degradation in the environment may all be considered in defining rapid degradability<sup>3</sup>.

<sup>&</sup>lt;sup>3</sup> Special guidance on data interpretation is provided in chapter 4.1 and annex 9 of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

- **2.9.3.2.5.1** Substances are considered rapidly degradable in the environment if the following criteria are met:
  - .1 In 28-day ready biodegradation studies, the following levels of degradation are achieved:
    - (i) tests based on dissolved organic carbon: 70%;
    - (ii) tests based on oxygen depletion or carbon dioxide generation: 60% of theoretical maxima;

These levels of biodegradation shall be achieved within 10 days of the start of degradation which point is taken as the time when 10% of the substance has been degraded; or

- .2 In those cases where only BOD and COD data are available, when the ratio of BOD<sub>5</sub>/COD is  $\geq$  0.5; or
- .3 If other convincing scientific evidence is available to demonstrate that the substance or mixture can be degraded (biotically and/or abiotically) in the aquatic environment to a level above 70% within a 28-day period.
- **2.9.3.2.6** *Chronic toxicity* data are less available than acute data and the range of testing procedures less standardized. Data generated according to the OECD Test Guidelines 210 (Fish Early Life Stage) or 211 (Daphnia Reproduction) and 201 (Algal Growth Inhibition) may be accepted. Other validated and internationally accepted tests may also be used. The "No Observed Effect Concentrations" (NOECs) or other equivalent L(E)Cx shall be used.

### 2.9.3.3 Substance classification categories and criteria

**2.9.3.3.1** Substances shall be classified as "environmentally hazardous substances (aquatic environment)", if they satisfy the criteria for <u>Acute 1</u>, <u>Chronic 1</u> or <u>Chronic 2</u>, according to the following tables:

### Acute toxicity

### **Category: Acute 1**

96 hr LC <sub>50</sub> (for fish)	$\leq 1$ mg/l and/or
48 hr EC <sub>50</sub> (for crustacea)	$\leq$ 1 mg/l and/or
72 or 96 hr $ErC_{50}$ (for algae or other aquatic plants)	$\leq 1 \text{ mg/l}$

### **Chronic toxicity**

### **Category: Chronic 1**

 $\begin{array}{ll} 96 \mbox{ hr } LC_{50} \mbox{ (for fish)} & \leq 1 \mbox{ mg/l and/or} \\ 48 \mbox{ hr } EC_{50} \mbox{ (for crustacea)} & \leq 1 \mbox{ mg/l and/or} \\ 72 \mbox{ or } 96 \mbox{ hr } ErC_{50} \mbox{ (for algae or other aquatic plants)} & \leq 1 \mbox{ mg/l and/or} \\ and the substance is not rapidly degradable and/or the log } K_{ow} \geq 4 \mbox{ (unless the experimentally determined BCF < 500)} \end{array}$ 

## **Category: Chronic 2**

 $\begin{array}{lll} 96 \mbox{ hr } LC_{50} \mbox{ (for fish)} &>1 \mbox{ to } \leq 10 \mbox{ mg/l} \\ and/or \\ 48 \mbox{ hr } EC_{50} \mbox{ (for crustacea)} &>1 \mbox{ to } \leq 10 \mbox{ mg/l} \\ and/or \\ 72 \mbox{ or } 96 \mbox{ hr } ErC_{50} \mbox{ (for algae or other aquatic plants)} &>1 \mbox{ to } \leq 10 \mbox{ mg/l} \\ and \mbox{ the substance is not rapidly degradable and/or the log } K_{ow} \geq 4 \mbox{ (unless the experimentally determined BCF <500), unless the chronic toxicity NOECs \\ are > 1 \mbox{ mg/l} \end{array}$ 



The classification flowchart below outlines the process to be followed.

\* Lowest value of 96-hour LC<sub>50</sub>, 48-hour EC<sub>50</sub> or 72-hour ErC<sub>50</sub>, as appropriate.

## 2.9.3.4 Mixtures classification categories and criteria

**2.9.3.4.1** The classification system for mixtures covers the classification categories which are used for substances meaning acute category 1 and chronic categories 1 and 2. In order to make use of all available data for purposes of classifying the aquatic environmental hazards of the mixture, the following assumption is made and is applied, where appropriate:

The "relevant ingredients" of a mixture are those which are present in a concentration of 1% by mass or greater, unless there is a presumption (e.g., in the case of highly toxic ingredients) that an ingredient present at less than 1% can still be relevant for classifying the mixture for aquatic environmental hazards.

- **2.9.3.4.2** The approach for classification of aquatic environmental hazards is tiered and dependent upon the type of information available for the mixture itself and its ingredients. Elements of the tiered approach include:
  - .1 classification based on tested mixtures;
  - .2 classification based on bridging principles;
  - .3 the use of "summation of classified ingredients" and/or an "additivity formula".

Figure 2.9.1 below outlines the process to be followed.

## Figure 2.9.1: Tiered approach to classification of mixtures for acute and chronic aquatic environmental hazards

Aquat	Aquatic toxicity test data available on the mixture as a whole									
<b>↓</b>	No		Yes	CLASSIFY for acute/ chronic toxicity hazard (2.9.3.4.3)						
Sufficient data available on similar mixtures to estimate hazards No	Yes —	Apply bridging principles (2.9.3.4.4)		CLASSIFY For acute/ chronic toxicity hazard						
Either aquatic toxicity or classification data available for all relevant ingredients	Yes	<ul> <li>Apply Summation Method (2.9.3.4.6.1 to 2.9.3.4.6.4) using:</li> <li>Percentage of all ingredients classified as "Chronic"</li> <li>Percentage of ingredients classified as "Acute"</li> <li>Percentage of ingredients with acute toxicity data: apply additivity formula (2.9.3.4.5.2) and convert the derived L(E)C<sub>50</sub> to the appropriate "Acute" Category</li> </ul>	•	CLASSIFY For acute/ chronic toxicity hazard						
Use available hazard data of known ingredients	<b></b>	Apply Summation Method and additivity formula, 2.9.3.4.6.1 to 2.9.3.4.6.4 and apply 2.9.3.4.6.5		CLASSIFY For acute/ chronic toxicity hazard						

### 2.9.3.4.3 Classification of mixtures when data are available for the complete mixture

- **2.9.3.4.3.1** When the mixture as a whole has been tested to determine its aquatic toxicity, it shall be classified according to the criteria that have been agreed for substances, but only for acute toxicity. The classification is based on the data for fish, crustacea and algae/plants. Classification of mixtures by using  $LC_{50}$  or  $EC_{50}$  data for the mixture as a whole is not possible for chronic categories since both toxicity data and environmental fate data are needed, and there are no degradability and bioaccumulation data for mixtures as a whole. It is not possible to apply the criteria for chronic classification because the data from degradability and bio-accumulation tests of mixtures cannot be interpreted; they are meaningful only for single substances.
- **2.9.3.4.3.2** When there is acute toxicity test data ( $LC_{50}$  or  $EC_{50}$ ) available for the mixture as a whole, this data as well as information with respect to the classification of ingredients for chronic toxicity shall be used to complete the classification for tested mixtures as follows. When chronic (long-term) toxicity data (NOEC) is also available, this shall be used in addition.
  - .1  $L(E)C_{50}$  (LC<sub>50</sub> or EC<sub>50</sub>) of the tested mixture  $\leq 1$  mg/l and NOEC of the tested mixture  $\leq 1.0$  mg/l or unknown:
    - classify mixture as category acute 1;
    - apply summation of classified ingredients approach (see 2.9.3.4.6.3 and 2.9.3.4.6.4) for chronic classification (chronic 1, 2, or no need of chronic classification).
  - .2  $L(E)C_{50}$  of the tested mixture  $\leq 1 \text{ mg/l}$  and NOEC of the tested mixture > 1.0 mg/l:
    - classify mixture as category acute 1;
    - apply summation of classified ingredients approach (see 2.9.3.4.6.3 and 2.9.3.4.6.4) for classification as Category Chronic 1. If the mixture is not classified as Category Chronic 1, then there is no need for chronic classification.
  - .3  $L(E)C_{50}$  of the tested mixture > 1 mg/l, or above the water solubility, and NOEC of the tested mixture  $\leq 1.0$  mg/l or unknown:
    - no need to classify for acute toxicity;
    - apply summation of classified ingredients approach (see 2.9.3.4.6.3 and 2.9.3.4.6.4) for chronic classification or no need for chronic classification.

- .4  $L(E)C_{50}$  of the tested mixture > 1 mg/l, or above the water solubility, and NOEC of the tested mixture > 1.0 mg/l:
  - No need to classify for acute or chronic toxicity.

## 2.9.3.4.4 Bridging principles

**2.9.3.4.4.1** Where the mixture itself has not been tested to determine its aquatic environmental hazard, but there are sufficient data on the individual ingredients and similar tested mixtures to adequately characterize the hazards of the mixture, this data shall be used in accordance with the following agreed bridging rules. This ensures that the classification process uses the available data to the greatest extent possible in characterizing the hazards of the mixture without the necessity for additional testing in animals.

### 2.9.3.4.4.2 Dilution

- **2.9.3.4.4.2.1** If a mixture is formed by diluting another classified mixture or a substance with a diluent which has an equivalent or lower aquatic hazard classification than the least toxic original ingredient and which is not expected to affect the aquatic hazards of other ingredients, then the mixture shall be classified as equivalent to the original mixture or substance.
- **2.9.3.4.4.2.2** If a mixture is formed by diluting another classified mixture or a substance with water or other totally non-toxic material, the toxicity of the mixture shall be calculated from the original mixture or substance.

### 2.9.3.4.4.3 Batching

**2.9.3.4.4.3.1** The aquatic hazard classification of one production batch of a complex mixture shall be assumed to be substantially equivalent to that of another production batch of the same commercial product and produced by or under the control of the same manufacturer, unless there is reason to believe there is significant variation such that the aquatic hazard classification of the batch has changed. If the latter occurs, new classification is necessary.

## 2.9.3.4.4.4 Concentration of mixtures which are classified with the most severe classification categories (chronic 1 and acute 1)

**2.9.3.4.4.1** If a mixture is classified as chronic 1 and/or acute 1, and ingredients of the mixture which are classified as chronic 1 and/or acute 1 are further concentrated, the more concentrated mixture shall be classified with the same classification category as the original mixture without additional testing.

### 2.9.3.4.4.5 Interpolation within one toxicity category

**2.9.3.4.4.5.1** If mixtures A and B are in the same classification category and mixture C is made in which the toxicologically active ingredients have concentrations intermediate to those in mixtures A and B, then mixture C shall be in the same category

as A and B. Note that the identity of the ingredients is the same in all three mixtures.

### 2.9.3.4.4.6 Substantially similar mixtures

- **2.9.3.4.4.6.1** Given the following:
  - .1 Two mixtures:
    - i) A + B
    - ii) C + B
  - .2 The concentration of ingredient B is the same in both mixtures;
  - .3 The concentration of ingredient A in mixture (i) equals that of component C in mixture (ii);
  - .4 Classification for A and C are available and are the same, i.e. they are in the same hazard category and are not expected to affect the aquatic toxicity of B,

then there shall be no need to test mixture (ii) if mixture (i) is already characterized by testing and both mixtures are classified in the same category.

# 2.9.3.4.5 Classification of mixtures when data are available for all components or only for some components of the mixture

- **2.9.3.4.5.1** The classification of a mixture shall be based on summation of the classification of its ingredients. The percentage of ingredients classified as "Acute" or "Chronic" will feed straight into the summation method. Details of the summation method are described in 2.9.3.4.6.1 to 2.9.3.4.6.4.1.
- **2.9.3.4.5.2** Mixtures are often made of a combination of both ingredients that are classified (as Acute 1 and/or Chronic 1, 2) and those for which adequate test data is available. When adequate toxicity data is available for more than one ingredient in the mixture, the combined toxicity of those [components] shall be calculated using the following additivity formula, and the calculated toxicity shall be used to assign that portion of the mixture an acute toxicity hazard which is then subsequently used in applying the summation method.

$$\frac{\sum Ci}{L(E)C_{50m}} = \sum_{n} \frac{Ci}{L(E)C_{50i}}$$

where:

Ci = concentration of ingredient i (mass percentage);

 $L(E)C_{50}i = (mg/l) LC_{50} \text{ or } EC_{50} \text{ for ingredient } i;$ 

n = number of ingredients, and i is running from 1 to n; and

 $L(E)Cm = L(E)C_{50}$  of the part of the mixture with test data

- **2.9.3.4.5.3** When applying the additivity formula for part of the mixture, it is preferable to calculate the toxicity of this part of the mixture using for each substance toxicity values that relate to the same species (i.e. fish, daphnia or algae) and then to use the highest toxicity (lowest value) obtained (i.e. use the most sensitive of the three species). However, when toxicity data for each ingredient are not available in the same species, the toxicity value of each ingredient shall be selected in the same manner that toxicity values are selected for the classification of substances, i.e., the higher toxicity (from the most sensitive test organism) is used. The calculated acute toxicity shall then be used to classify this part of the mixture as Acute 1 using the same criteria described for substances.
- **2.9.3.4.5.4** If a mixture is classified in more than one way, the method yielding the more conservative result shall be used.

### 2.9.3.4.6 *Summation method*

### 2.9.3.4.6.1 Classification procedure

- **2.9.3.4.6.1.1** In general a more severe classification for mixtures overrides a less severe classification, e.g., a classification with chronic 1 overrides a classification with chronic 2. As a consequence the classification procedure is already completed if the results of the classification is chronic 1. A more severe classification than chronic 1 is not possible and it is not necessary therefore to undergo the further classification procedure.
- 2.9.3.4.6.2 Classification for the acute category 1
- **2.9.3.4.6.2.1** All ingredients classified as acute 1 shall be considered. If the sum of these ingredients is greater than or equal to 25% the whole mixture shall be classified as category acute 1. If the result of the calculation is a classification of the mixture as category acute 1, the classification process is completed.
- **2.9.3.4.6.2.2** The classification of mixtures for acute hazards based on this summation of classified ingredients, is summarized in Table 2.9.1 below.

## Table 2.9.1: Classification of a mixture for acute hazards, based on summation of classified ingredients

Sum of ingredients classified as:	Mixture is classified as:				
Acute $1 \times M^1 \ge 25\%$	Acute 1				

<sup>1</sup> For explanation of the M factor, see 2.9.3.4.6.4.

### 2.9.3.4.6.3 Classification for the chronic categories 1, 2

- **2.9.3.4.6.3.1** First, all ingredients classified as chronic 1 are considered. If the sum of these ingredients is greater than or equal to 25% the mixture shall be classified as category chronic 1. If the result of the calculation is a classification of the mixture as category chronic 1 the classification procedure is completed.
- **2.9.3.4.6.3.2** In cases where the mixture is not classified as chronic 1, classification of the mixture as chronic 2 is considered. A mixture shall be classified as chronic 2 if 10 times the sum of all ingredients classified as chronic 1 plus the sum of all ingredients classified as chronic 2 is greater than or equal to 25%. If the result of the calculation is classification of the mixture as chronic 2, the classification process is completed.
- **2.9.3.4.6.3.3** The classification of mixtures for chronic hazards, based on this summation of classified ingredients, is summarized in Table 2.9.2 below.

## Table 2.9.2: Classification of a mixture for chronic hazards, based on summation of classified ingredients

Sum of ingredients classified	Mixture is classified as:	
Chronic $1 \times M^1$	≥25%	Chronic 1
$(M \times 10 \times Chronic 1)+Chronic 2$	≥25%	Chronic 2

<sup>1</sup> For explanation of the M factor, see 2.9.3.4.6.4.

### 2.9.3.4.6.4 Mixtures with highly toxic ingredients

2.9.3.4.6.4.1 Acute category 1 ingredients with toxicities well below 1 mg/l may influence the toxicity of the mixture and are given increased weight in applying the summation of classification approach. When a mixture contains ingredients classified as acute or chronic category 1, the tiered approach described in 2.9.3.4.6.2 and 2.9.3.4.6.3 shall be applied using a weighted sum by multiplying the concentrations of acute category 1 ingredients by a factor, instead of merely adding up the percentages. This means that the concentration of "Acute 1" in the left column of Table 2.9.1 and the concentration of "Chronic 1" in the left column of Table 2.9.2 are multiplied by the appropriate multiplying factor. The multiplying factors to be applied to these ingredients are defined using the toxicity value, as summarized in Table 2.9.3 below. Therefore, in order to classify a mixture containing acute 1 and/or chronic 1 ingredients, the classifier needs to be informed of the value of the M factor in order to apply the summation method. Alternatively, the additivity formula (2.9.3.4.5.2) may be used when toxicity data are available for all highly toxic ingredients in the mixture and there is convincing evidence that all other ingredients, including those for which specific acute toxicity data are not available, are of low or no toxicity and do not significantly contribute to the environmental hazard of the mixture.

L(E)C <sub>50</sub> value	Multiplying factor (M)
$0.1 < L(E)C_{50} \le 1$	1
$0.01 < L(E)C_{50} \le 0.1$	10
$0.001 < L(E)C_{50} \le 0.01$	100
$0.0001 < L(E)C_{50} \le 0.001$	1000
$0.00001 < L(E)C_{50} \le 0.0001$	10000
(continue in factor 10 intervals)	

 Table 2.9.3: Multiplying factors for highly toxic ingredients of mixtures

- **2.9.3.4.6.5** Classification of mixtures with ingredients without any useable information
- **2.9.3.4.6.5.1** In the event that no useable information on acute and/or chronic aquatic hazard is available for one or more relevant ingredients, it is concluded that the mixture cannot be attributed (a) definitive hazard category(ies). In this event, the mixture shall be classified based on the known ingredients only with the additional statement that: "x percent of the mixture consists of ingredient(s) of unknown hazards to the aquatic environment."

## 2.9.3.5 Substances or mixtures dangerous to the aquatic environment not otherwise classified under the provisions of this Code

**2.9.3.5.1** Substances or mixtures dangerous to the aquatic environment not otherwise classified under this Code shall be designated:

UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. or UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. They shall be assigned to Packing Group III".

### **Consequential amendments:**

### **Contents page:**

- **Chapter 2.9** Replace "Class 9 Miscellaneous dangerous substances and articles" with "Miscellaneous dangerous substances and articles (Class 9) and environmentally hazardous substances".
- 2.9.3 Insert "2.9.3 Environmentally hazardous substances (aquatic environment)"

### Chapter 2.10

**2.10.1** Replace definition with "*Marine pollutants* means substances which are subject to the provisions of Annex III of MARPOL 73/78, as amended."

**2.10.2** Replace section with:

### **"2.10.2 General provisions**

- **2.10.2.1** Marine pollutants shall be transported under the provisions of Annex III of MARPOL 73/78, as amended.
- **2.10.2.2** The Index indicates by the symbol **P** in column headed MP those substances, materials and articles that are identified as marine pollutants.
- **2.10.2.3** Marine pollutants shall be transported under the appropriate entry according to their properties if they fall within the criteria of any of the classes 1 to 8. If they do not fall within the criteria of any of these classes, they shall be transported under the entry: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., UN 3077 or ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., UN 3082, as appropriate, unless there is a specific entry in class 9.
- **2.10.2.4** Column 4 of the Dangerous Goods List also provides information on marine pollutants using the symbol **P**.
- **2.10.2.5** When a substance, material or article possesses properties that meet the criteria of a marine pollutant but is not identified in this Code, such substance, material or article shall be transported as a marine pollutant in accordance with the Code.
- **2.10.2.6** With the approval of the competent authority (see 7.9.2), substances, materials or articles that are identified as marine pollutants in this Code but which no longer meet the criteria as a marine pollutant need not be transported in accordance with the provisions of this Code applicable to marine pollutants."
- **2.10.3** Replace section with:

### "2.10.3 Classification

- **2.10.3.1** Marine pollutants shall be classified in accordance with chapter 2.9.3."
- **2.10.4** Delete section

### **Consequential amendments:**

### **Contents page:**

- 2.10.2 Replace "Properties" with "General provisions"
- 2.10.3 Delete "of solutions, mixtures and isomers"
- 2.10.4 Delete "2.10.4 Guidelines for the identification of harmful substances in packaged form (marine pollutants)"

### PART 3

Replace "and limited quantities exceptions" with ", special provisions and exceptions" in the heading.

### **Consequential amendment:**

#### **Contents page:**

## PART 3 Replace "AND LIMITED QUANTITIES EXCEPTIONS" with ", SPECIAL PROVISIONS AND EXCEPTIONS"

### Chapter 3.1

- **3.1.2** Delete "Where, in this Code, the term "Proper Shipping Name" is used, it is the "correct technical name" required by regulation 4 of Annex III of MARPOL 73/78, as amended." in **Note 1**
- **3.1.2.** Delete "3.4.5 and" in **Note 2**
- **3.1.2.2.2** Amend the name to read: "ALKYLSULPHONIC ACIDS, SOLID or ARYLSULPHONIC ACIDS, SOLID" in UN 2583
- **3.1.2.8.1.1** Resize printing to standard size (English only).
- **3.1.2.8.1.3** Delete "If a package contains a marine pollutant, the recognized chemical name of the marine pollutant needs to be shown."
- **3.1.2.8.1.4** Renumber paragraph as 3.1.2.8.1.3
- **3.1.2.9** Insert "Marine Pollutants"
- **3.1.2.9.1** Insert "For generic or "not otherwise specified" (N.O.S.) entries, the proper shipping name shall be supplemented with the recognized chemical name of the marine pollutant."
- **3.1.2.9.2** Examples illustrating the selection of the Proper Shipping Name supplemented with the recognized technical name of goods for such entries are indicated below:

UN 1993, FLAMMABLE LIQUID, N.O.S. (propyl acetate, di-n-butyltin-di-2ethylhexanoate), class 3, PG III, (50°C c.c.), MARINE POLLUTANT

UN 1263, PAINT (triethylbenzene), class 3, PG III, (27°C c.c.), MARINE POLLUTANT

#### 3.1.4.4.1

UN 1805 Replace "liquid" with "solution" (English and French only)

UN 1811	Insert ", solid" after "hydrogendifluoride" (English and French only)
UN 1848	Replace "90% by mas" with "less than 90% acid by mass" (English only)
UN 2511	Replace "2-chloropropionic acid" with "2-Chloropropionic acid" (English only)
UN 2531	Replace "inhibited" with "stablilized" (English only)
UN 2740	Replace " <i>n</i> -Propyl" with "Propyl"
UN 2794	Insert "2794 Batteries, wet filled with acid electric storage"
3.1.4.4.2	
UN 2073	Replace "< 0.880 at 15°C in water" with "less than 0.880 at 15°C in water, with more than 35% but not more than 50% ammonia"
3.1.4.4.6	
UN 2205	Replace "1,4-dicyanobutane" with "Adiponitryl"
3.1.4.4.7	
UN 1794	Replace "> 3% free acid" with "more than 3% free acid"
UN 2331	Replace "chlorate" with "choride" (English only)
UN 2777	Replace "Mercury-based" with "Mercury based" (English only)
UN 2778	Replace "Mercury-based" with "Mercury based" (English only)
UN 2878	Insert a comma after the word "titanium" (twice) (English only)
UN 3011	Replace "Mercury-based" with "Mercury based" (English and French only)
UN 3012	Replace "Mercury-based" with "Mercury based" (English only)
3.1.4.4.8	
UN 2208	Replace ">" with "more than" and "with not less" with "not more than"
UN 2741	Replace "> 22%" with "more than 22%"
3.1.4.4.10	
UN 1278	Replace "Propyl chloride" with "I-Chloropropane"
UN 1702	Replace "Tetrachloroethane" with "1,1,2,2- Tetrachloroethane"

- UN 1991 Replace "inhibited" with "stabilized" (English only)
- UN 2339 Replace "2-bromobutane" with "2-Bromobutane" (English only)
- 3.1.4.4.11
- UN 2777 Replace "Mercury-based" with "Mercury based" (English only)
- UN 2778 Replace "Mercury-based" with "Mercury based" (English only)
- UN 3011 Replace "Mercury-based" with "Mercury based" (English only)
- UN 3012 Replace "Mercury-based" with "Mercury based" (English only)
- 3.1.4.4.12
- UN 1487 Replace "mixtures" with "mixture" (English only)
- 3.1.4.4.15
- UN 1383 Insert "pyrophoric" before the word "metal" (English and French only)
- 3.1.4.4.18
- UN 2672 Insert a comma before the words "by mass" (English only)
- UN 2073 Add "in water" after "at 15°C"

### **Consequential amendments**

**5.4.1.4.3.5** Insert "and for generic or not otherwise specified" (N.O.S.) entries, the proper shipping name shall be supplemented with the recognized chemical name of the marine pollutant (see 3.1.2.9)."

### Chapter 3.2

- **3.2.1** Replace the running title "Dangerous goods list" with the title "Dangerous Goods List" (English only)
- Column 1 Replace "Committee" with "Sub-Committee"
- **Column 4** Replace section with:

"Subsidiary risk(s) – this column contains the class number(s) of any subsidiary risk(s) which have been identified by applying the classification system described in part 2. This column also identifies a dangerous good as a marine pollutant as follows:

 $\mathbf{P}$  – Marine pollutant a non-exhaustive list of known marine pollutants, based on previous criteria and assignment"

- **Column 7** Replace section with:
  - "Column 7a "Limited Quantities" this column provides the maximum quantity per inner packaging or article for transporting dangerous goods as limited quantities in accordance with chapter 3.4.
  - Column 7b "Excepted Quantities" this column provides an alpha numeric code described in sub-section 3.5.1.2 which indicates the maximum quantity per inner and outer packaging for transporting dangerous goods as excepted quantities in accordance with chapter 3.5."
- **Column 12** Replace paragraph with "(Reserved)"
- Column 13 Delete "UN"
- **3.2.2** Abbreviations and symbols
- TableDelete lines 3 and 5

### **Dangerous goods list**

- Column (7) Renumber as column (7a)
  Column (7b) Insert new column headed "Excepted quantities"
  Column (7a/b) Insert common heading "Limited and Excepted quantity provisions"
- Column 12 Delete column
- Column 13 Replace "UN t" with "T"

Insert a new row below the headings with the corresponding reference paragraphs as follows:

(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
3.1.2	2.0	2.0	2.0.1.3	3.3	3.4	3.5	4.1.4	4.1.4	4.1.4	4.1.4

Insert a new row below the headings with the corresponding reference paragraphs as follows:

(13)	(14)	(15)	(16)	(17)
4.2.5	4.2.5	5.4.3.2	7.1	
4.3		7.3	7.2	

Replace column (7) with split column (7a) and (7b)

Limited and Excepted quantity provisions						
LQ	EQ					
(7a)	(7b)					

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Replace entry with:

(1)	(2)		(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
2031	NITRIC ACID other than red fuming, with at least 65% but with not more than 70% nitric acid	8	5.1	II	-	11	E2	P001	PP81	IBC02	B15 B20
2031	NITRIC ACID, other than red fuming, with less than 65% nitric acid		-	II	-	11	E2	P001	PP81	IBC02	B15 B20

(13)	(14)	(15)	(16)	(17)	(18)
T8	TP2	F-A, S-Q	Category D.	Colourless liquid. Oxidant; may cause fire in	2031
			Segregation as	contact with organic materials such as wood,	
			for class 5.1 but	cotton or straw, evolving highly toxic gases	
			"Separated	(brown fumes). Highly corrosive to most	
			from" classes	metals. Causes severe burns to skin, eyes,	
			4.1, 5.1 and 7	mucous membranes.	
T8	TP2	F-A, S-B	Category D	See entry above.	2031

UN Nos. 3334 and 3335 Replace entries with:

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
3334	AVIATION REGULATED		-	-	960	-	-	-	-	-	-
	LIQUID N.O.S										
3335	AVIATION REGULATED SOLID, N.O.S	9	-	-	960	-	-	-	-	-	-

(13)	(14)	(15)	(16)	(17)	(18)
-	-	-	-	Not subject to the provisions of this Code but	3334
				may be subject to provisions governing the	
				transport of dangerous goods by other modes.	
-	-	-	-	Not subject to the provisions of this Code but	3335
				may be subject to provisions governing the	
				transport of dangerous goods by other modes.	

**Column (1)** Renumber "UN 0333, 1.4S" as "UN 0337"

**Column (2)** Insert a comma after the words "30% water" for UN 0114

**Column (2)** Insert a comma after the words "20% water" for UN 0129

- **Column (2)** Insert a comma after the words "20% water" for UN 0135
- **Column (2)** Delete the comma after the word "wetted" for UN 0220 (English only)
- **Column (2)** Insert a comma after the word "carbon" for UN 0222 (English only)
- Column (2) Delete "," after "... RDX)" for UN 0391
- **Column (2)** Delete the comma after the word "RDX)" for UN 0391 (English only)
- **Column (2)** Insert ", PENTHRITE" before ", PETN" for UN 0411 (French)
- Column (2) Delete "-" after ", PLASTICS" for UN 0459
- Column (2) Delete "-" after ", PLASTICS" for UN 0460
- **Column (2)** Delete the comma after "NITRITE" for UN 1194 (English only)
- Column (2) Insert "(PICRIC ACID)" after "TRINITROPHENOL" for UN 1344
- **Column (2)** Insert "(TNT)" after "TRINITROTOLUENE" for UN 1356
- **Column (2)** Insert commas after "12%" and "15", respectively for UN 1374 (English only)
- **Column (2)** Insert a comma after the word "acid" and before the words "by mass" for UN 1779 (English and French only)
- Column (2) Replace "hydrofluoric acid" with "hydrogen fluoride" for UN 1790
- **Column (2)** Delete "solution" for UN 1790 (twice) (French)
- **Column (2)** Insert a comma after the word "90%" and before the words "by mass" for UN 1848 (English and French only)
- **Column (2)** Insert a comma after the word "12%" and before the words "by mass" for UN 2216 (English and French only)
- **Column (2)** Replace "ISOCYANATES" with "ISOCYANATE" (twice) for UN 2478 (English only)
- **Column (2)** Insert a comma after the word "ammonia" and before the words "by mass" for UN 2672 (English and French only)
- Column (2) Insert a comma after the word "PENTOXIDE" and before the word "non-fused" for UN 2862
- **Column (2)** Delete the comma after the words "N.O.S" for UN 2903 (English only)
- Column (2) Insert a comma before the words "non-fissile" for UN 2912 (English and Spanish only) I:\MSC\84\24-Add-1.doc

- **Column (2)** Insert a comma before the words "non-fissile" for UN 2916 (English and Spanish only)
- **Column (2)** Insert a comma before the words "non-fissile" for UN 2917 (English and Spanish only)
- **Column (2)** Insert a comma before the words "non-fissile" for UN 2919
- **Column (2)** Replace "LITHIUM BATTERIES" with "LITHIUM METAL BATTERIES (including lithium alloy batteries)" for UN 3090
- Column (2) Insert "METAL" after "LITHIUM" for UN 3091 (twice) Insert "(including lithium alloy batteries)" after "WITH EQUIPMENT"
- **Column (2)** Insert a comma after the word "acid" and before the word "STABILIZED" for UN 3149 (English only)
- Column (2) Delete comma after the word "ALCOHOL" and before the word "with" for UN 3294 (English only)
- **Column (2)** Insert a comma after the word "water" and before the words "by mass" for UN 3317 (English and French only)
- **Column (2)** Insert a comma before the word "non-fissile" for UN 3323 (English only)
- Column (2) Insert a comma before the word "non-special form" for UN 3327
- **Column (2)** Insert a comma before the word "non-fissile" for UN 3332 (English and Spanish only)
- Column (2) Add "," after "... LIQUID" for UN 3334
- Column (2) Insert "(PENTAERYTHRITOL TETRANITRATE; PETN)" after "... TETRANITRATE" for UN 3344
- Column (2) Add "," after "TOXINS" for UN 3462 PG I, II and III
- Column (2) Insert "or HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM CONTAINED IN EQUIPMENT or HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM PACKED WITH EQUIPMENT" after "... STORAGE SYSTEM" for UN 3468
- **Column (2)** Replace "FUEL CELL CARTRIDGES" with "FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT" for UN 3473

Column (4) Delete "•" for:

- No PG UN Nos. 1075, 1078, 1950, 1953, 1954, 1955, 1956, 1964, 1965, 1967, 1968, 3156, 3157, 3158, 3160, 3161, 3162, 3163, 3164, 3167, 3168, 3169, 3303, 3304, 3305, 3306, 3307, 3308, 3309, 3310, 3311, 3312, 3319, 3343, 3354 and 3355
- PG I UN Nos. 1133, 1139, 1263, 1268, 1383, 1389, 1392, 1409, 1421, 1479, 1544, 1556, 1557, 1583, 1601, 1602, 1693, 1694, 1759, 1760, 1866, 1903, 1986, 1988, 1989, 1992, 1993, 2430, 2570, 2588, 2630, 2733, 2734, 2735, 2757, 2758, 2759, 2760, 2761, 2762, 2763, 2764, 2771, 2772, 2775, 2776, 2779, 2780, 2781, 2782, 2783, 2784, 2801, 2810, 2811, 2813, 2845, 2846, 2902, 2903, 2920, 2921, 2922, 2923, 2924, 2927, 2928, 2929, 2930, 2988, 2991, 2992, 2993, 2994, 2995, 2996, 2997, 2998, 3005, 3006, 3009, 3010, 3013, 3014, 3015, 3016, 3017, 3018, 3021, 3024, 3025, 3026, 3027, 3084, 3085, 3086, 3087, 3093, 3094, 3095, 3096, 3098, 3099, 3100, 3121, 3122, 3123, 3124, 3125, 3129, 3130, 3131, 3132, 3134, 3135, 3137, 3139, 3140, 3142, 3143, 3145, 3147, 3148, 3172, 3194, 3200, 3208, 3209, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267, 3273, 3275, 3276, 3278, 3279, 3280, 3281, 3282, 3283, 3284, 3285, 3286, 3287, 3288, 3289, 3290, 3295, 3301, 3336, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389, 3390, 3391, 3392, 3393, 3394, 3395, 3396, 3397, 3398, 3399, 3401, 3402, 3439, 3440, 3448, 3449, 3462, 3464, 3465, 3466, 3467 and 3469
- UN Nos. 1133, 1139, 1169, 1197, 1203, 1224, 1228, 1263, 1266, 1268, PG II 1287, 1293, 1300, 1306, 1325, 1393, 1409, 1450, 1458, 1459, 1461, 1462, 1477, 1479, 1482, 1483, 1544, 1556, 1557, 1564, 1583, 1601, 1602, 1693, 1719, 1740, 1759, 1760, 1851, 1866, 1903, 1908, 1986, 1987, 1988, 1989, 1992, 1993, 1999, 2206, 2430, 2478, 2557, 2570, 2588, 2627, 2733, 2734, 2735, 2742, 2757, 2758, 2759, 2760, 2761, 2762, 2763, 2764, 2771, 2772, 2775, 2776, 2779, 2780, 2781, 2782, 2783, 2784, 2801, 2810, 2811, 2813, 2837, 2902, 2903, 2920, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929, 2930, 2985, 2986, 2987, 2991, 2992, 2993, 2994, 2995, 2996, 2997, 2998, 3005, 3006, 3009, 3010, 3013, 3014, 3015, 3016, 3017, 3018, 3021, 3024, 3025, 3026, 3027, 3066, 3071, 3080, 3084, 3085, 3086, 3087, 3088, 3089, 3093, 3094, 3095, 3096, 3097, 3098, 3099, 3100, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3133, 3134, 3135, 3139, 3140, 3142, 3143, 3147, 3148, 3172, 3175, 3176, 3178, 3179, 3180, 3181, 3182, 3183, 3184, 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3205, 3206, 3208, 3209, 3210, 3211, 3212, 3213, 3214, 3218, 3219, 3243, 3244, 3248, 3249, 3259, 3260, 3261, 3262, 3264, 3265, 3266, 3267, 3269, 3271, 3272, 3273, 3274, 3275, 3276, 3277, 3278, 3279, 3280, 3281, 3282, 3283, 3284, 3285, 3286, 3287, 3288, 3289, 3290, 3295, 3301, 3336, 3344, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3357, 3361, 3362, 3395, 3396, 3397, 3398,

3399, 3400, 3407, 3439, 3440, 3448, 3462, 3464, 3465, 3466, 3467, 3469, 3470 and 3471

- PG III UN Nos. 1133, 1139, 1169, 1197, 1224, 1228, 1263, 1266, 1268, 1287, 1293, 1300, 1306, 1325, 1353, 1373, 1458, 1459, 1477, 1479, 1481, 1482, 1483, 1544, 1556, 1557, 1564, 1583, 1601, 1602, 1719, 1740, 1759, 1760, 1851, 1866, 1903, 1908, 1986, 1987, 1988, 1989, 1992, 1993, 1999, 2006, 2206, 2238, 2319, 2430, 2478, 2570, 2588, 2623, 2667, 2693, 2733, 2735, 2757, 2759, 2761, 2763, 2771, 2775, 2779, 2781, 2783, 2801, 2810, 2811, 2813, 2837, 2856, 2902, 2903, 2904, 2905, 2922, 2923, 2924, 2925, 2926, 2991, 2992, 2993, 2994, 2995, 2996, 2997, 2998, 3005, 3006, 3009, 3010, 3013, 3014, 3015, 3016, 3017, 3018, 3025, 3026, 3027, 3066, 3077, 3082, 3085, 3087, 3088, 3089, 3097, 3098, 3099, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3133, 3134, 3135, 3139, 3140, 3142, 3143, 3145, 3145, 3147, 3148, 3172, 3176, 3178, 3179, 3180, 3181, 3182, 3183, 3184, 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3205, 3206, 3208, 3209, 3210, 3211, 3213, 3215, 3216, 3218, 3219, 3248, 3249, 3256, 3257, 3258, 3259, 3260, 3261, 3262, 3263, 3263, 3264, 3265, 3266, 3267, 3269, 3271, 3272, 3276, 3278, 3280, 3281, 3282, 3283, 3284, 3285, 3287, 3288, 3295, 3336, 3345, 3347, 3348, 3349, 3351, 3352, 3395, 3396, 3397, 3398, 3399, 3400, 3407, 3439, 3440, 3462, 3464, 3465, 3466, 3467, 3469and 3471
- Column (4) Replace "PP" with "P" for:
  - PG I UN Nos. 1259, 1381, 1626, 1698, 1699, 2024, 2025, 2026, 2316, 2317, 2447, 2471, 2777, 2778, 2786, 2787, 2788, 3011, 3012, 3019, 3020, 3146 and 3450
  - PG II UN Nos. 1587, 1623, 1624, 1625, 1627, 1629, 1630, 1631, 1634, 1636, 1637, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1653, 1674, 1679, 1894, 1895, 2024, 2025, 2026, 2315, 2567, 2574, 2777, 2778, 2786, 2787, 2788, 3011, 3012, 3019, 3020, 3146, 3151, 3152, 3155 and 3432
  - PG III UN Nos. 2024, 2025, 2026, 2046, 2279, 2518, 2777, 2786, 2788, 3011, 3012, 3019, 3020 and 3146
- **Column (4)** Replace "0" with "-" for UN 0004
- **Column (4)** Insert "5.1" for UN 1017
- Column (4) Replace "5.1P" with "5.1" over "P" for UN 2727 (English only)
- **Column (4)** Replace "172" with "SP 172" for UN 3322 (English only)
- Column (5) Replace "I" with "II" for UN Nos. 1250 and 1305

- **Column (6)** Insert "332" for UN 1474
- **Column (6)** Insert "340" for UN Nos. 3269 and 3316
- **Column (6)** Insert "179" for UN Nos. 3077 and 3082
- **Column (6)** Insert "335" for UN Nos. 3077 and 3082
- **Column (6)** Insert "341" for UN Nos. 2814, 2900 and 3373
- **Column (6)** Delete "330" for UN Nos. 1170, 1987 and 1993
- **Column (6)** Delete "918" for UN No. 1357
- **Column (6)** Delete "944" for:
  - PG II UN Nos. 1133, 1139, 1169, 1197, 1203, 1224, 1228, 1263, 1266, 1268, 1287, 1293, 1300, 1306, 1325, 1450, 1458, 1459, 1461, 1462, 1477, 1479, 1481, 1482, 1483,1719, 1740, 1759, 1760, 1866, 1903, 1908, 1986, 1987, 1988, 1989, 1992, 1993, 1999, 2430, 2478, 2627, 2733, 2734, 2735, 2758, 2760, 2762, 2764, 2772, 2776, 2780, 2782, 2784, 2801, 2920, 2921, 2922, 2923, 2924, 3021, 3024, 3066, 3084, 3085, 3087, 3089, 3093, 3095, 3096, 3098, 3099, 3139, 3145, 3147, 3175, 3178, 3179, 3180, 3181, 3182, 3210, 3211, 3212, 3214, 3218, 3219, 3244, 3248, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267, 3269, 3271, 3272, 3273, 3274, 3286, 3295, 3336, 3346, 3350, 3407, 3469, 3470 and 3471
  - PG III UN Nos. 1133, 1139, 1169, 1197, 1224, 1228, 1263, 1266, 1268, 1287, 1293, 1300, 1306, 1325, 1353, 1458, 1459, 1477, 1479, 1481, 1482, 1483, 1544, 1556, 1557, 1564, 1583, 1601, 1602, 1719, 1740, 1759, 1760, 1851, 1866, 1903, 1908, 1986, 1987, 1988, 1989, 1992, 1993, 1999, 2206, 2319, 2430, 2478, 2570, 2588, 2623, 2667, 2693, 2733, 2735, 2757, 2759, 2761, 2763, 2771, 2775, 2779, 2781, 2783, 2801, 2810, 2811, 2813, 2837, 2856, 2902, 2903, 2904, 2905, 2922, 2923, 2924, 2925, 2926, 2991, 2992, 2993, 2994, 2995, 2996, 2997, 2998, 3005, 3006, 3009, 3010, 3013, 3014, 3015, 3016, 3017, 3018, 3025, 3026, 3027, 3066, 3077, 3082, 3085, 3087, 3089, 3098, 3099, 3134, 3139, 3140, 3142, 3143, 3145, 3147, 3148, 3172, 3178, 3179, 3180, 3181, 3182, 3208, 3210, 3211, 3213, 3215, 3216, 3218, 3219, 3248, 3249, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267, 3269, 3271, 3272, 3276, 3278, 3280, 3281, 3282, 3283, 3284, 3285, 3287, 3288, 3295, 3336, 3345, 3347, 3348, 3349, 3351, 3352, 3407, 3439, 3440, 3462, 3464, 3465, 3466, 3467, 3469 and 3471

Column (7a) Replace "None" with "0" wherever it appears

Column (7a) Replace "3 *l*" with "1 *l*" for UN 1170, PG II

- Column (7a) Replace "g" and "kg" with "ml" and "l" respectively for UN 3148 PG II and PG III
- Column (7a) Replace "1 *l*" with "0" for UN 1818
- Column (7a) Replace "500 ml" with "1 l" for UN 2315, UN 2778, UN 2787 and UN 3151, PG II

Replace "500 g" with "1 kg" for UN 3152 and UN 3432, PG II

Column (7a) Replace "500 ml" with "5 l" for UN 2024, UN 2046, UN 2279, UN 2518, UN 2788, UN 3011, UN 3012, UN 3019 and UN 3020, PG III

Replace "500 g" with "5 kg" for UN 2025, UN 2026, UN 2777, UN 2786 and UN 3146, PG III

Column (7b) Insert "E0" for:

All goods of classes 1, 2.1, 2.3, 5.2, 6.2 and 7

All goods of class 2.2 with a subsidiary risk in column (4) and UN Nos. 1044, 1950, 2037, 2857 and 3164

UN Nos. 1204, 2059, 3064, 3256, 3343, 3357, 3379 and 3473 in class 3

All goods of class 3 with a subsidiary risk in column (4), PG I

All goods of class 4.1, PG I, and UN Nos. 1327, 2304, 2448, 2555, 2556, 2557, 2907, 3176 (PG II and PG III), 3221 to 3240, 3319, 3344 and 3360

All goods of class 4.2, PG I, and UN 1856

All goods of class 4.3, PG I, and UN 3292

All goods of class 5.1, PG I and UN Nos. 2426 and 3356

All goods of class 8, PG I, and UN Nos. 1774, 2028, 2215 (MOLTEN), 2576, 2794, 2795, 2800, 2803, 2809 and 3028

UN Nos. 1845, 2807, 2990, 3072, 3090, 3091, 3166, 3171, 3245, 3257, 3258, 3268, 3359 and 3363 of class 9

UN Nos. 1600, 1700, 2016, 2017, 2312 and 3250 of class 6.1

#### Column (7b) Insert "E1" for:

All goods of class 2.2 without subsidiary risk in column (4)

All goods of class 3 without a subsidiary risk in column (4), PG III, except for UN Nos. 2059, 3256 and 3269

All goods of class 3 with a subsidiary risk in column (4), PG III

All goods of class 4.1, PG III, except for UN Nos. 2304, 2448 and 3176

All goods of class 4.2, PG III

All goods of class 4.3, PG III

All goods of class 5.1, PG III

All goods of class 6.1, PG III

All goods of class 8, PG III, except for UN Nos. 2215 (MOLTEN), 2803 and 2809

All goods of class 9, PG III, except for UN 1845, 2807, 3257, 3258 and 3268

Column (7b) Insert "E2" for:

All goods of class 3 without a subsidiary risk in column (4), PG II, except for UN Nos. 1204, 2059, 3064, 3269 and 3357

All goods of class 3 with a subsidiary risk in column (4), PG II

All goods of class 4.1, PG II, except for UN Nos. 2555, 2556, 2557, 2907, 3176, 3319 and 3344

All goods of class 4.2, PG II

All goods of class 4.3, PG II, except for UN 3292

All goods of class 5.1, PG II, except for UN 3356

All goods of class 8, PG II, except for UN Nos. 1774, 2028 and 2576

All goods of class 9, PG II, except for UN Nos. 3090, 3091, 3480 and 3481

- **Column (7b)** Insert "E3" for all goods of class 3 without a subsidiary risk in column (4), PG I, except for UN Nos. 2059 and 3379
- **Column (7b)** Insert "E4" for all goods of class 6.1, PG II, except for UN Nos. 1600, 1700, 2016, 2017, 2312 and 3250
- Column (7b) Insert "E5" for all goods of class 6.1, PG I
- Column (7b) Insert "See SP340" for UN Nos. 3269 and 3316

- Column (8) Replace "P003" with "P004" for UN 3473
- **Column (8)** Replace "P001" with "P010" for UN Nos. 1162, 1196, 1250, 1298, 1305, 1724, 1728, 1747, 1753, 1762, 1763, 1766, 1767, 1769, 1771, 1781, 1784, 1799, 1800, 1801, 1804, 1816, 2434, 2435, 2437, 2985, 2986, 2987, 3361 and 3362
- **Column (8)** Replace "P601" with "P804" for UN 1744
- **Column (8)** Replace "P001" with "P010" for UN 1818
- Column (9) Delete "PP6" for UN Nos. 1851, 3248 and 3249, PG II and PG III
- Column (9) Delete "PP88" for UN 3473
- Column (9) Insert "PP1" for UN 3082
- Column (9) Insert "PP31" for UN 3398 and UN 3399, PG I, PG II and PG III
- Column (9) Delete "PP82" for UN 1744
- Column (10) Insert "IBC02" for UN 2059 PG II
- Column (10) Insert "IBC03" for UN 2059 PG III
- Column (10) Delete "IBC01" for UN Nos. 3361 and 3362
- **Column (10)** Delete "IBC02" for UN Nos. 1162, 1196, 1298, 1724, 1728, 1747, 1753, 1762, 1763, 1766, 1767, 1769, 1771, 1781, 1784, 1799, 1800, 1801, 1804, 1816, 1818, 2434, 2435, 2437, 2985, 2986 and 2987
- Column (11) Insert "B2" and "B4" for UN 3432
- **Column (11)** Insert "B2" for UN Nos. 1463, 1473, 1484, 1485, 1487, 1488, 1490, 1493, 1494, 1495, 1512, 1514, 1751, 2465, 2468, 2627 and 3247
- Column (11) Replace "T7" with "-" for UN 2949
- Column (13) Insert "BK2" for UN Nos. 2814 and 3373
- Column (13) Delete "only for animal carcasses" for UN 2900
- Column (13) Insert "T9" for UN Nos. 2813 and 3131, PG I
- Column (13) Replace "T11" with "T10" for UN Nos. 1250 and 1305
- Column (13) Replace "T14" with "T22" for UN Nos. 1092, 1238, 1239 and 1244, PG I
- **Column (13)** Replace "T14" with "T20" for UN Nos. 1098, 1143, 1163, 1595, 1695, 1752, 1809, 2334, 2337, 2646 and 3023, PG I

- **Column (13)** Replace "T7" with "T10" for UN Nos. 1162, 1196, 1298, 1724, 1728, 1747, 1753, 1762, 1763, 1766, 1767, 1769, 1771, 1781, 1784, 1799, 1800, 1801, 1804, 1816, 1818, 2434, 2435 and 2437
- Column (13) Replace "T10" with "T14" for UN Nos. 1183, 1242 and 2988
- Column (13) Insert "T22" for UN Nos. 1185, 1994 and 2480, PG I
- Column (13) Replace "T11" with "T14" for UN Nos. 2985, 2986, 3361 and 3362
- Column (13) Replace "T10" with "T20" for UN 1569
- Column (13) Insert "T20" for UN 1647, PG I
- Column (13) Insert "TP2" and "TP13" for UN 1647, PG I
- Column (13) Replace "TP2" with "T7" for UN 2949
- Column (13) Insert "BK2" for UN 3077
- Column (13) Insert "T14" for UN 3129 PG I
- Column (13) Insert "T11" for UN 3129 PG II
- Column (13) Insert "T7" for UN 3129 PG III
- Column (13) Insert "T9" for UN 3148 PG I
- Column (13) Insert "T7" for UN 3148 PG II
- Column (13) Insert "T7" for UN 3148 PG III
- Column (14) Delete "TP9" for:
  - PG I
    UN Nos. 1268, 1383, 1544, 1556, 1557, 1588, 1601, 1655, 1759, 1760, 1935, 1986, 1988, 1989, 1992, 1993, 2025, 2026, 2430, 2588, 2733, 2734, 2735, 2758, 2760, 2762, 2764, 2772, 2776, 2778, 2780, 2782, 2784, 2787, 2788, 2801, 2810, 2811, 2845, 2902, 2903, 2920, 2921, 2922, 2923, 2924, 2927, 2928, 2929, 2930, 2988, 2991, 2992, 2993, 2994, 2995, 2996, 2997, 2998, 3005, 3006, 3009, 3010, 3011, 3012, 3013, 3014, 3015, 3016, 3017, 3018, 3019, 3020, 3021, 3024, 3025, 3026, 3084, 3086, 3095, 3096, 3124, 3125, 3143, 3145, 3146, 3147, 3200, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267, 3273, 3275, 3276, 3278, 3279, 3280, 3281, 3282, 3283, 3284, 3285, 3286, 3287, 3288, 3289, 3290, 3295, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389, 3390, 3439, 3440, 3448, 3462, 3464, 3465, 3466, and 3467

Column (14) Delete "TP12" for:

- PG I UN Nos. 1739, 1744, 1745, 1746, 1754, 1758, 1777, 1786, 1790, 1796, 1798, 1826, 1828, 1829, 1831, 1834, 1836, 1873, 2031, 2032, 2240, 2692, 2699, 2879, and 3246
- PG II UN Nos. 1716, 1717, 1736, 1737, 1738, 1742, 1743, 1755, 1764, 1768, 1776, 1778, 1782, 1789, 1790, 1796, 1817, 1826, 1830, 1832, 1906, 2031, 2308, 2353, 2513, 2571, 2584, 2796, and 2817
- PG III UN Nos. 1755, 1789 and 2817
- Column (14) Insert "TP27" for UN Nos. 3361 and 3362
- Column (14) Insert "TP35" for UN Nos. 1092, 1238, 1239 and 1244, PG I
- Column (14) Insert "TP35" for UN Nos. 1098, 1143, 1163, 1595, 1695, 1752, 1809, 2334, 2337, 2646 and 3023, PG I
- **Column (14)** Insert "TP7" for UN Nos. 1162, 1196, 1250, 1298, 1305, 1724, 1728, 1747, 1753, 1762, 1763, 1766, 1767, 1769, 1771, 1781, 1784, 1799, 1800, 1801, 1804, 1816, 2434, 2435, 2437, 2985, 2986, 2987, 3361 and 3362
- Column (14) Insert "TP2" and "TP13" for UN Nos. 1185, 1994 and 2480, PG I
- Column (14) Insert "TP13" for UN 1239, PG I, and for UN Nos. 1781, 1804, 1818, 2986 and 2987
- Column (14) Insert "TP7" for UN Nos. 2813 and 3131, PG I
- Column (14) Insert "TP33" for UN Nos. 2813 and 3131, PG I
- Column (14) Replace "-" with "TP2" for UN 2949
- Column (14) Insert "TP2" and "TP7" for UN 3129 PG I
- Column (14) Insert "TP2" for UN 3129 PG II
- Column (14) Insert "TP1" for UN 3129 PG III
- Column (14) Insert "TP2" and "TP7" for UN 3148 PG I
- Column (14) Insert "TP2" for UN 3148 PG II
- Column (14) Insert "TP1" for UN 3148 PG III
- Column (14) Insert "TP9" for UN 3375

- Column (16) Replace "chlorates and perchlorates" with "chlorates or perchlorates" for UN 0082
- **Column (16)** Replace the words "siftproof" and "packaging" with the words "sift-proof" and "packages", respectively for UN 0160 (English only)
- **Column (16)** Replace the words "siftproof" and "packaging" with the words "sift-proof" and "packages", respectively for UN 0161 (English only)
- **Column (16)** Insert a full stop at the end of the sentence for UN 0243 (English only)
- **Column (16)** Insert a full stop at the end of the sentence for UN 0244 (English only)
- **Column (16)** Insert a full stop at the end of the sentence for UN 0245 (English only)
- Column (16) Delete the comma after the words "WHITE PHOSPHORUS" for UN 0246 (English and French only)
- **Column (16)** Insert a full stop at the end of the sentence for UN 0248 (English only)
- Column (16) Insert a full stop at the end of the sentence for UN 0248 (English only)
- Column (16) Insert a full stop at the end of the sentence for UN 0249 (English only)
- **Column (16)** Insert a full stop at the end of the sentence for UN 0250 (English only)
- **Column (16)** Insert a full stop at the end of the sentence for UN 0303 (English only)
- **Column (16)** Insert a full stop at the end of the sentence for UN 0332 (English only) Replace "chlorates and perchlorates" with "chlorates or perchlorates"
- **Column (16)** Insert a full stop at the end of the sentence for UN 0354 (English only)
- **Column (16)** Insert a full stop at the end of the sentence for UN 0355 (English only)
- Column (16) In the first sentence, insert a semi-colon after the word "stowage" for UN 0498 (English only)
- Column (16) In the first sentence, insert a semi-colon after the word "stowage" for UN 0499 (English only)
- Column (16) Insert "Segregation as for class 5.1 but "Separated from" class 7 for UN 1017
- **Column (16)** Replace "Category B" with "Category D" for UN 1082
- Column (16) Insert the words "goods of" before the words "class 1" for UN 1131 (English only)
- Column (16) Insert the words "goods of" before the words "class 1" for UN 1259 (English only) I:\MSC\84\24-Add-1.doc

- **Column (16)** Insert a full stop at the end of the sentence for UN 1386 (English only)
- Column (16) Insert the word "is" after "stowage" and before "recommended" for UN 1363 (English and French only)
- Column (16) Insert after "ammonium compounds" ", other than AMMONIUM PERSULPHATE (UN 1444)," for UN 1492 and UN 1505
- Column (16) Remove the parentheses around the words "c.c." for UN 2211
- Column (16) Replace "carbon tetracholoride" with "CARBON TETRACHLORIDE (UN 1846)" for UN 3254
- **Column (16)** Delete "UN 3052 and UN 3461" for UN 2716
- Column (16) Insert the words "goods of" after "carrying" and before "class 1" for UN 3194 (English and French only)
- **Column (16)** Insert "However the segregation provisions concerning ammonium compounds do not apply to mixtures of ammonium persulphates and/or potassium persulphates" for UN 3215
- Column (16) Replace "Category E" with "Category D" for UN 3399 PG I and II
- Column (17) Insert "For ships transporting an INF cargo as defined in regulation VII/14 of the SOLAS Convention, 1974, as amended, refer also to the INF Code." For UN Nos. 2916, 2917, 2919, 3323, 3328, 3329, 3330 and 3331.
- **Column (17)** Insert a full stop at the end of the sentence for UN 0018 (English only)
- Column (17) In the second sentence, replace "substance" with "substances" for UN 0151 (English only)
- **Column (17)** Replace "substances" with "substance" for UN 0216 (English only)
- Column (17) Insert a full stop at the end of the sentence for UN 0246 (English only)
- **Column (17)** Insert quotation marks after "WEAPONS, BLANK" and before "CARTRIDGES" for UN 0338 (English and French only)
- Column (17) Insert quotation marks after "PROJECTILE" and before "CARTRIDGES" for UN 0339 (English and French only)
- Column (17) Insert a comma after the word "CASES" for UN 0446
- Column (17) Insert a comma after the word "CASES" for UN 0447
- **Column (17)** Move the sentence "Highly irritating to skin, eyes and mucous membranes" to the end of the text for UN 1005

- Column (17) Insert "Powerful oxidant which may cause fire" after "mucous membranes." for UN 1017
- **Column (17)** Insert "%" after "1.6" for UN 1088 (English only)
- Column (17) Delete the comma after the word "liquid" for UN 1092
- **Column (17)** Insert a colon after the words "Explosive limits" for UN 1106 (English only)

Replace the comma after "22%" with a full stop for UN 1106 (English only)

- **Column (17)** Move the sentence "Toxic if swallowed, by skin contact or by inhalation" to the end of the text for UN 1131
- **Column (17)** Remove the sentence "reacts violently with acids" from the end of the text and insert it before "Highly toxic if swallowed..." for UN 1163
- Column (17) Replace "Flashpoint" with "flashpoint" for UN 1170 (English only)
- Column (17) Insert a colon after the word "product" for UN 1194 (English only)
- Column (17) Remove the sentence "Reacts violently with acids" and insert it before the sentence "Causes burns..." for UN 1235
- **Column (17)** Remove the sentence "Reacts violently with acids" and insert it after the sentence "Miscible with water." For UN 1244
- Column (17) Delete the comma before the word "cotton" for UN 1318
- Column (17) Replace "explosive" with "explosives" for UN 1321
- Column (17) Delete the comma after the words "such as" for UN 1350 (English and Spanish only)
- Column (17) Move the sentence "Harmful if swallowed or by skin contact" to the end of the text for UN 1354
- Column (17) Move the sentence "Harmful if swallowed or by skin contact" to the end of the text for UN 1356
- Column (17) Replace "acid" with "acids" for UN 1390 (English only)
- Column (17) Replace "acid" with "acids" for UN 1405 (English only)
- Column (17) Insert a comma after the word "fire" and before the word "may" for UN 1455 (English and Spanish only)
- **Column (17)** Insert a comma after the word "fire" and before the word "may" for UN 1456 (English and Spanish only)

- **Column (17)** Insert a comma after the word "fire" and before the word "may" for UN 1458 (English and Spanish only)
- **Column (17)** Insert a comma after the word "fire" and before the word "may" for UN 1459 (English and Spanish only)
- **Column (17)** Insert a comma after the word "fire" and before the word "may" for UN 1473 (English and Spanish only)
- **Column (17)** Insert a comma after the word "fire" and before the word "may" for UN 1475 (English and Spanish only)
- **Column (17)** Insert a comma after the word "fire" and before the word "may" for UN 1484 (English and Spanish only)
- Column (17) Insert a comma after the word "fire" and before the word "may" for UN 1485 (English and Spanish only)
- Column (17) Insert a comma after the word "fire" and before the word "may" for UN 1490 (English and Spanish only)
- Column (17) Insert a comma after the word "fire" and before the word "may" for UN 1495 (English and Spanish only)
- **Column (17)** Insert a comma after the word "fire" and before the word "may" for UN 1496 (English and Spanish only)
- Column (17) Insert a comma after the word "fire" and before the word "may" for UN 1502 (English and Spanish only)
- Column (17) Insert a comma after the word "fire" and before the word "may" for UN 1503 (English and Spanish only)
- Column (17) Insert a comma after the word "fire" and before the word "may" for UN 1506 (English and Spanish only)
- Column (17) Insert a comma after the word "fire" and before the word "may" for UN 1508 (English and Spanish only)
- Column (17) Insert a comma after the word "fire" and before the word "may" for UN 1513 (English and Spanish only)
- **Column (17)** Insert a comma after the word "fire" and before the word "may" for UN 1515 (English and Spanish only)
- Column (17) Replace the first "acid" with "acids" for UN 1626 (English only)
- **Column (17)** Replace the first "acid" with "acids" for UN 1636 (English only)

- **Column (17)** Replace the first "acid" with "acids" for UN 1642 (English only)
- **Column (17)** Replace "acid" with "acids" for UN 1688 (English only)
- Column (17) Insert a colon after the word "Flashpoint" and before the word "25°C" for UN 1695 (English only)
- **Column (17)** Move the sentence "Reacts violently with acids" after the sentence "Corrosive.." and before the sentence "Reacts with ammonium" for UN 1719 (English and French only)
- Column (17) Replace "acid" with "acids" for UN 1727 (English only)
- **Column (17)** Replace "acid" with "acids" for UN 1756 (English only)
- **Column (17)** Replace "acid" with "acids" for UN 1757 (English only)
- **Column (17)** Remove the sentence "Pure FORMIC ACID..." from the end of the text and insert it before the sentence "Corrosive to most metals" for UN 1779
- Column (17) Replace "acid" with "acids" for UN 1791 (English only)
- Column (17) Delete the comma after the word "liquid" for UN 1808
- Column (17) Delete the comma after the word "liquid" for UN 1809
- Column (17) Delete the comma after the word "liquid" for UN 1810
- Column (17) Delete the comma after the word "liquid" for UN 1817
- Column (17) Delete the comma after the word "liquid" for UN 1828
- Column (17) Delete the comma after the word "liquid" for UN 1837
- Column (17) Insert a colon after the words "Boiling range" for UN 1863 (English only)
- **Column (17)** Replace "acid" with "acids" for UN 1869 (English only)
- Column (17) Replace "acid" with "acids" for UN 1908 (English only)
- **Column (17)** Insert "%" after "1.8" for UN 1917 (English only)
- **Column (17)** Remove the sentence "Reacts violently with acids" and insert it before the second sentence of the text for UN 1922
- Column (17) Replace "acid" with "acids" for UN 1935 (English only)
- **Column (17)** Delete the comma after the word "air" for UN 1923 (English only)

- Column (17) Insert a comma after the word "liquefied" for UN 1951
- Column (17) Replace "Poisonous" with "Toxic" for UN 1975 (English and Spanish only)
- **Column (17)** Replace "acid" with "acids" for UN 2019 (English only)
- **Column (17)** Remove the sentence "Reacts violently with acids" and insert it after the second sentence of the text for UN 2029
- Column (17) Delete the comma after the word "liquid" for UN 2258
- **Column (17)** Replace "liquid" with "liquids" for UN 2348 (English and Spanish only)
- **Column (17)** Replace "liquid" with "liquids" for UN 2371 (English only)
- **Column (17)** Remove the sentence "Reacts violently with acids" and insert it after the sentence "Miscible with water." for UN 2379
- **Column (17)** Remove the sentence "Reacts violently with acids" and insert it after the sentence "Miscible with water." for UN 2382
- **Column (17)** Remove the sentence "Reacts violently with acids" and insert it after the sentence "Immiscible with water." for UN 2386
- **Column (17)** Remove the sentence "Reacts violently with acids" and insert it after the sentence "Miscible with water." for UN 2399
- Column (17) Insert a colon after the word "Flashpoint" for UN 2604 (English only)
- **Column (17)** Replace "acid" with "acids" for UN 2624 (English only)
- Column (17) Replace "flashpoints" with "flashpoint" for UN 2742 (English only)
- Column (17) Replace "Salt-c" with "C" for UN 2950
- Column (17) Move the sentence "Cause burns to skin, eyes and mucous membranes" to the end of the text for UN 2986
- Column (17) Move the sentence "Cause burns to skin, eyes and mucous membranes" to the end of the text for UN 2987
- Column (17) Replace "Causes" with "Cause" for UN 2988 (English only)
- Column (17) At the beginning of the sentence, replace "They" with "It" for UN 2995
- Column (17) At the beginning of the sentence, replace "They" with "It" for UN 2997

- **Column (17)** At the beginning of the sentence, replace "They" with "It", and "Mercury-based" with "Mercury based" for UN 3011 (second replacement English only)
- Column (17) Replace "Mercury-based" with "Mercury based" for UN 3012 (English only)
- **Column (17)** Insert a new line before paragraph 5 for UN 3065 (English only)
- Column (17) Delete "or lithium alloy" for UN 3090
- Column (17) Replace "Immiscible with" with "Insoluble in" for UN 3232
- Column (17) Replace "Immiscible with" with "Insoluble in" for UN 3238
- Column (17) Replace "Immiscible with" with "Insoluble in" for UN 3240
- **Column (17)** Replace "acid" with "acids" for UN 3275 (English only)
- Column (17) Replace "acid" with "acids" for UN 3276 (English only)
- Column (17) Replace "Soluble in water" with "Miscible with water" for UN 3302
- Column (17) Insert the word "c.c." after "-30°C" for UN 3342
- **Column (17)** Replace "generator" with "generators" for UN 3356 (English only)
- **Column (17)** Replace existing text with "See entry above" for UN 3412 (English only)
- **Column (17)** Delete the parentheses around the word "c.c." for UN 3463 (English only)
- Column (17) Insert ", which is much lighter than air" after "odourless gas" for UN 3468
- Column (17) Replace existing text with "See entry above" for UN 3469
- Column (17) Replace existing text with "See entry above" for UN 3471 (English only)
- **Column (17)** Insert "Fuel cell cartridges may also be shipped in, or packed with, equipment." after "... water solutions." for UN 3473
- Column (17) Insert "Electrical batteries containing lithium ion encased in a rigid metallic body. Lithium batteries may also be shipped in, or packed with, equipment. Electrical lithium batteries may cause fire due to an explosive rupture of the body caused by improper construction or reaction with contaminants." for UN Nos. 3480 and 3481
- Column (17) Replace "See 1.1.3.1.1 and IAEA Transport Schedule" with "See 1.5.1" for UN Nos. 2908, 2909, 2910, 2911, 2912, 2913, 2915, 2916, 2917, 2919, 2977, 2978, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3332 and 3333

Insert new entries:

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(13)	(14)	(15)	(16)	(17)	(18)
0505	SIGNALS, DISTRESS, ship	1.4G	-	-	-	0	E0	P135	-	-	-	-	-	F-B,	Category 06	See glossary of	0506
														S-X		terms in appendix	
																B for "SIGNALS,	
0506	CLONAL C DISTRICC 1	1.40				0	50	D125						ГР		DISTRESS, ship	0506
0506	SIGNALS, DISTRESS, ship	1.48	-	-	-	0	EO	P135	-	-	-	-	-	F-B,	Category 05	See glossary of	0506
														5-A		P for "SIGNALS	
																DISTRESS shin"	
0507	SIGNALS SMOKE	148	-	-	-	0	E0	P135	-	-	-	_	_	F-B	Category 05	See glossary of	0507
0001		1.10				Ŭ	Ξů	1150						S-X	cutegory of	terms in appendix	0007
														~		B for "SIGNALS,	
																SMOKE"	
0508	1-HYDROXYBENZOTRIAZOLE,	1.3C	-	-	-	0	E0	P114(b)	PP48	-	-	-	-	F-B,	Category 10	Substance	0508
	ANHYDROUS, dry or wetted with								PP50					S-Y			
	less than 20% water, by mass																
1910	CALCIUM OXIDE	8	-	-	960	-	-	-	-	-	-	-	-	-	-	Not subject to the	1910
																provisions of this	
																Code but may be	
																subject to	
																provisions	
																transport of	
																dangerous goods	
																by other modes.	
2808	MAGNETIZED MATERIAL	9	-	-	960	-	-	-	-	-	-	-	-	-	-	Not subject to the	2807
																provisions of this	
																Code but may be	
																subject to	
																provisions	
																governing the	
																transport of	
																dangerous goods	
								1								by other modes.	

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(13)	(14)	(15)	(16)	(17)	(18)
2812	SODIUM ALUMINATE, SOLID	8	-	-	960	-	-	-	-	-	-	-	-	-	-	Not subject to the	2812
																provisions of this	
																Code but may be	
																subject to	
																provisions	
																governing the	
																transport of	
																dangerous goods	
																by other modes.	
3166	ENGINE, INTERNAL	9	-	-	960	-	-	-	-	-	-	-	-	-	-	Types of articles	3166
	COMBUSTION or VEHICLE,															transported under	
	FLAMMABLE GAS POWERED															this entry include	
	or VEHICLE, FLAMMABLE															internal	
	LIQUID POWERED															combustion	
																engines,	
																compression/igniti	
																on engines, motor	
																vehicles, hybrid	
																vehicles,	
																motorcycles and	
																boats. Not subject	
																to the provisions of	
																this Code but may	
																be subject to	
																provisions	
																governing the	
																transport of	
																dangerous goods	
																by other modes.	
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(13)	(14)	(15)	(16)	(17)	(18)
------	-------------------------	-----	-----	-----	-----	------	------	-----	-----	------	------	------	------	------	------	----------------------	------
3171	BATTERY-POWERED VEHICLE	9	-	-	960	-	-	-	-	-	-	-	-	-	-	Types of articles	3171
	or BATTERY-POWERED															transported under	
	EQUIPMENT															this entry include	
																vehicles or	
																equipment	
																powered by wet	
																batteries, sodium	
																batteries or lithium	
																batteries with the	
																batteries installed,	
																such as	
																electrically-	
																powered cars,	
																lawnmowers,	
																wheelchairs and	
																other mobility aids.	
																Not subject to the	
																provisions of this	
																Code but may be	
																subject to	
																provisions	
																governing the	
																transport of	
																dangerous goods	
																by other modes.	

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(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(13)	(14)	(15)	(16)	(17)	(18)
3474	1-HYDROXYBENZOTRIAZOLE,	4.1	-	Ι	28	0	E0	P406	PP48	-	-	-	-	F-B,	Category D.	Desensitized	3474
	ANHYDROUS, WETTED with													S-J	"Away from"	explosive. White	
	not less than 20% water, by mass														class 3 and	to light beige	
															heavy metals	powder. Explosive	
															and their salts.	and sensitive to	
																friction in the dry	
																state. When	
																involved in a fire,	
																evolves toxic	
																fumes; in closed	
																compartments	
																these fumes may	
																form an explosive	
																mixture with air.	
																May form	
																extremely sensitive	
																compounds with	
																heavy metals or	
																their salts.	
3475	ETHANOL AND GASOLINE	3	-	II	333	1 l	E2	P001	-	IBC0	-	T4	TP1	F-E,	Category E.	Colourless, volatile	3475
	MIXTURE or ETHANOL AND									2				S-E		liquids. Misciblity	
	MOTOR SPIRIT MIXTURE or															with water depends	
	ETHANOL AND PETROL															on the	
	MIXTURE, with more than 10%															composition.	
2456		4.2			220	500	ГО	<b>D</b> 004						ГО			2456
3476	FUEL CELL CARTRIDGES or	4.3	-	-	328	500	EO	P004	-	-	-	-	-	F-G,	Category A.	Fuel cell cartridges	3476
	FUEL CELL CARTRIDGES				334	ml or								S-P		containing water	
	CUNTAINED IN EQUIPMENT or					500 g										reactive substances	
	FUEL CELL CAKIKIDGES															may also be	
	PACKED WITH EQUIPMENT,															snipped in or	
	containing water-reactive															packed with,	
1	substances					1			1		1					equipment.	1

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(13)	(14)	(15)	(16)	(17)	(18)
3477	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing corrosive substances	8	-	-	328 334	1 <i>l</i> or 1 kg	E0	P004	-	-	-	-	-	F-A, S-B	Category A.	Fuel cell cartridges containing corrosive substances may also be shipped in or packed with, equipment.	3477
3478	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing liquefied flammable gas	2.1	-	-	328 338	120 m <i>l</i>	E0	P004	-	-	-	-	-	F-D, S-U	Category B.	Fuel cell cartridges containing butane or other flammable liquefied gas may also be shipped in or packed with equipment.	3478
3479	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing hydrogen in metal hydride	2.1	-	-	328 339	120 m/	EO	P004	-	-	-	-	-	F-D, S-U	Category B.	Fuel cell cartridges containing hydrogen, butane or other flammable odourless gas, which is much lighter than air, may also be shipped in or packed with equipment.	3479

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(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(13)	(14)	(15)	(16)	(17)	(18)
3480	LITHIUM ION BATTERIES	9	-	II	188	0	E0	P903	-	-	-	-	-	F-A,	Category A.	Electrical batteries	3480
	(including lithium ion polymer				230									S-I		containing lithium	
	batteries)				310											ion encased in a	
					957											rigid metallic	
																body. Lithium ion	
																batteries may also	
																be shipped in, or	
																packed with,	
																equipment.	
																Electrical lithium	
																batteries may	
																cause fire due to an	
																explosive rupture	
																of the body caused	
																by improper	
																construction or	
																reaction with	
																contaminants.	

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(13)	(14)	(15)	(16)	(17)	(18)
3481	LITHIUM ION BATTERIES	9	-	II	188	0	E0	P903	-	-	-	-	-	F-A,	Category A.	Electrical batteries	3481
	CONTAINED IN EQUIPMENT or				230									S-I		containing lithium	
	LITHIUM ION BATTERIES				957											ion encased in a	
	PACKED WITH EQUIPMENT															rigid metallic	
	(including lithium ion polymer															body. Lithium ion	
	batteries)															batteries may also	
																be shipped in, or	
																packed with,	
																equipment.	
																Electrical lithium	
																batteries may	
																cause fire due to an	
																explosive rupture	
																of the body caused	
																by improper	
																construction or	
																reaction with	
																contaminants.	

# Chapter 3.3

- SP106 Delete
- **SP169** Replace "no more than" with "not more than" (English only)

Replace "these regulations" with "the provisions of this Code" (English only)

- **SP181** Insert the word "see" before "5.4.2.5.5.1" (English only)
- **SP188** Replace SP188 with "Cells and batteries offered for transport are not subject to other provisions of this Code if they meet the following:
  - .1 For a lithium metal or lithium alloy cell, the lithium content is not more than 1g, and for a lithium-ion cell, the Watt-hour rating is not more than 20 Wh;
  - .2 For a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g, and for a lithium-ion battery, the Watt-hour rating is not more than 100 Wh. Lithium ion batteries subject to this provision shall be marked with the Watt-hour rating on the outside case;
  - .3 Each cell or battery is of the type proved to meet the requirements of each test in the United Nations Manual of Tests and Criteria, Part III, sub-section 38.3;
  - .4 Cells and batteries, except when installed in equipment, shall be packed in inner packagings that completely enclose the cell or battery. Cells and batteries shall be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit. The inner packagings shall be packed in strong outer packagings which conform to the provisions of 4.1.1.1, 4.1.1.2, and 4.1.1.5.
  - .5 Cells and batteries when installed in equipment shall be protected from damage and short circuit, and the equipment shall be equipped with an effective means of preventing accidental activation. When batteries are installed in equipment, the equipment shall be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packagings capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
  - .6 Except for packages containing no more than four cells installed in equipment or no more than two batteries installed in equipment, each package shall be marked with the following:
    - (i) an indication that the package contains "lithium metal" or "lithium ion" cells or batteries, as appropriate;

- (ii) an indication that the package shall be handled with care and that a flammability hazard exists if the package is damaged;
- (iii) an indication that special procedures shall be followed in the event the package is damaged, to include inspection and repacking if necessary; and
- (iv) a telephone number for additional information.
- .7 Each consignment of one or more packages marked in accordance with paragraph .6 shall be accompanied with a document including the following:
  - (i) an indication that the package contains "lithium metal" or "lithium ion" cells or batteries, as appropriate;
  - (ii) an indication that the package shall be handled with care and that a flammability hazard exists if the package is damaged;
  - (iii) an indication that special procedures shall be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - (iv) a telephone number for additional information.
- .8 Except when batteries are installed in equipment, each package shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents; and
- .9 Except when batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass."

As used above and elsewhere in this Code, "lithium content" means the mass of lithium in the anode of a lithium metal or lithium alloy cell. Separate entries exist for lithium metal batteries and lithium ion batteries to facilitate the transport of these batteries for specific modes of transport and to enable the application of different emergency response actions."

- **SP198** Replace "UN 1210, UN 1263 and UN 3066." with "UN Nos. 1210, 1263, 3066, 3469 and 3470."
- SP199 Replace "are considered insoluble. See ISO 3711:1990." with "(see ISO 3711:1990 "Lead chromate pigments and lead chromate-molybdate pigments Specifications and methods of test") are considered insoluble and are not subject to the provisions of this Code unless they meet the criteria for inclusion in another hazard class."

- SP216 Replace "bulk packaging" with "bulk container"
- SP217 Replace "bulk packaging" with "bulk container"
- SP218 Replace "bulk packaging" with "bulk container"
- **SP236** Replace "The quantity limit shown in column 7 of the Dangerous Goods List applies to the base material." with "The quantity limit and the excepted quantity code shown in columns 7a and 7b of the Dangerous Goods List apply to the base material"
- **SP251** Replace "the word "NONE" has been indicated in column 7" with "the quantity "0" has been indicated in column 7a"

Replace "quantity limits applicable to individual substances as specified in column 7" with "quantity limits for limited quantities applicable to individual substances as specified in column 7a"

- SP289 Replace "Air bags or seat-belts" with "Air bag inflators, air bag modules or seat-belt pretensioners"
- **SP299.iv** Tampico Fibre, dry having a density not less than 360 kg/m<sup>3</sup>
- **SP301** Replace "in column 7" by "in column 7a" (twice)
- SP307.2 Insert "and/or mineral calcium sulphate" after "dolomite"
- SP310 Replace "100 lithium cells" with "100 cells"
- SP328 Replace text with:
  - **"328** This entry applies to fuel cell cartridges including when contained in equipment or packed with equipment. Fuel cell cartridges installed in or integral to a fuel cell system are regarded as contained in equipment. Fuel cell cartridge means an article that stores fuel for discharge into the fuel cell through a valve(s) that controls the discharge of fuel into the fuel cell. Fuel cell cartridges, including when contained in equipment, shall be designed and constructed to prevent fuel leakage under normal conditions of transport.

Fuel cell cartridge design types using liquids as fuels shall pass an internal pressure test at a pressure of 100 kPa (gauge) without leakage.

Except for fuel cell cartridges containing hydrogen in metal hydride which shall be in compliance with special provision 339, each fuel cell cartridge design type shall be shown to pass a 1.2 meter drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss of contents."

- SP330 Delete
- Insert "SP332 Magnesium nitrate hexahydrate is not subject to the provisions of this Code.
  - **SP333** Ethanol and gasoline, motor spirit or petrol mixtures for use in spark-ignition engines (e.g., in automobiles, stationary engines and other engines) shall be assigned to this entry regardless of variations in volatility.
  - **SP334** A fuel cell cartridge may contain an activator provided it is fitted with two independent means of preventing unintended mixing with the fuel during transport.
  - **SP335** Mixtures of solids which are not subject to the provisions of this Code and environmentally hazardous liquids assigned to UN 3082 may be classified and transported as UN 3077, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging or cargo transport unit is closed. If free liquid is visible at the time the mixture is loaded or at the time the packaging or cargo transport unit is closed the mixture shall be classified as UN 3082. Each cargo transport unit shall be leakproof when used as a bulk container. Sealed packets and articles containing less than 10 ml of an environmentally hazardous liquid assigned to UN 3082, absorbed into a solid material but with no free liquid in the packet or article, or containing less than 10 g of an environmentally hazardous solid assigned to UN 3077, are not subject to the provisions of this Code.
  - **SP338** Each fuel cell cartridge transported under this entry and designed to contain a liquefied flammable gas shall:
    - .1 Be capable of withstanding, without leakage or bursting, a pressure of at least two times the equilibrium pressure of the contents at 55°C;
    - .2 Not contain more than 200 ml of liquefied flammable gas with a vapour pressure not exceeding 1 000 kPa at 55°C; and
    - .3 Pass the hot water bath test prescribed in 6.2.4.1 of chapter 6.2.
  - SP339 Fuel cell cartridges containing hydrogen in a metal hydride transported under this entry shall have a water capacity less than or equal to 120 ml. The pressure in the fuel cell cartridge shall not exceed 5 MPa at 55°C. The design type shall withstand, without leaking or bursting, a pressure of two (2) times the design pressure of the cartridge at 55°C or 200 kPa more than the design pressure of the cartridge at 55°C, whichever is greater. The pressure at which this test is conducted is referred to in the Drop Test and the Hydrogen Cycling Test as the "minimum shell burst pressure".

Fuel cell cartridges shall be filled in accordance with procedures provided by the manufacturer. The manufacturer shall provide the following information with each fuel cell cartridge:

- .1 Inspection procedures to be carried out before initial filling and before refilling of the fuel cell cartridge;
- .2 Safety precautions and potential hazards to be aware of;
- .3 Method for determining when the rated capacity has been achieved;
- .4 Minimum and maximum pressure range;
- .5 Minimum and maximum temperature range; and
- .6 Any other requirements to be met for initial filling and refilling including the type of equipment to be used for initial filling and refilling.

The fuel cell cartridges shall be designed and constructed to prevent fuel leakage under normal conditions of transport. Each cartridge design type, including cartridges integral to a fuel cell, shall be subjected to and shall pass the following tests:

#### **Drop test**

A 1.8 metre drop test onto an unyielding surface in four different orientations:

- .1 Vertically, on the end containing the shut-off valve assembly;
- .2 Vertically, on the end opposite to the shut-off valve assembly;
- .3 Horizontally, onto a steel apex with a diameter of 38 mm, with the steel apex in the upward position; and
- .4 At a 45° angle on the end containing the shut-off valve assembly.

There shall be no leakage, determined by using a soap bubble solution or other equivalent means on all possible leak locations, when the cartridge is charged to its rated charging pressure. The fuel cell cartridge shall then be hydrostatically pressurized to destruction. The recorded burst pressure shall exceed 85% of the minimum shell burst pressure.

#### Fire test

A fuel cell cartridge filled to rated capacity with hydrogen shall be subjected to a fire engulfment test. The cartridge design, which may include a vent feature integral to it, is deemed to have passed the fire test if:

- .1 The internal pressure vents to zero gauge pressure without rupture of the cartridge; or
- .2 The cartridge withstands the fire for a minimum of 20 minutes without rupture.

# Hydrogen cycling test

This test is intended to ensure that a fuel cell cartridge design stress limits are not exceeded during use.

The fuel cell cartridge shall be cycled from not more than 5% rated hydrogen capacity to not less than 95% rated hydrogen capacity and back to not more than 5% rated hydrogen capacity. The rated charging pressure shall be used for charging and temperatures shall be held within the operating temperature range. The cycling shall be continued for at least 100 cycles.

Following the cycling test, the fuel cell cartridge shall be charged and the water volume displaced by the cartridge shall be measured. The cartridge design is deemed to have passed the hydrogen cycling test if the water volume displaced by the cycled cartridge does not exceed the water volume displaced by an uncycled cartridge charged to 95% rated capacity and pressurized to 75% of its minimum shell burst pressure.

#### **Production leak test**

Each fuel cell cartridge shall be tested for leaks at  $15^{\circ}C \pm 5^{\circ}C$ , while pressurized to its rated charging pressure. There shall be no leakage, determined by using a soap bubble solution or other equivalent means on all possible leak locations.

Each fuel cell cartridge shall be permanently marked with the following information:

- .1 The rated charging pressure in megapascals (MPa);
- .2 The manufacturer's serial number of the fuel cell cartridges or unique identification number; and
- .3 The date of expiry based on the maximum service life (year in four digits; month in two digits).
- **SP340** Chemical kits, first aid kits and polyester resin kits containing dangerous substances in inner packagings which do not exceed the quantity limits for excepted quantities applicable to individual substances as specified in

column 7b of the Dangerous Goods List may be transported in accordance with chapter 3.5. Class 5.2 substances, although not individually authorized as excepted quantities in the Dangerous Goods List, are authorized in such kits and are assigned code E2 (see 3.5.1.2).

- **SP341** Bulk transport of infectious substances in BK2 bulk containers is only permitted for infectious substances contained in animal material as defined in 1.2.1 (see 4.3.2.4.1)."
- **SP900** Delete comma after the word "BROMATE" (English only)

Delete comma after the word "CHLORATE" (English only)

Delete comma after the word "PERMANGANATE" (English only)

Delete comma after the word "CYANIDE" (English only)

- **SP909** Delete "The provisions of this entry are applicable to:
  - substances designated as marine pollutants by a superscript "**P**" or "**PP**" next to its name in the Index; and
  - mixtures or isomers of substances identified as marine pollutants by a "**P**" or "**PP**" in the Index and which meet the criteria of 2.10.3 and which do not meet the classification criteria of any other hazard class."
- **SP910.1** Replace "the IMO publication *Recommendations on the Safe Use of Pesticides in Ships*" with "MSC/Circ.[...] Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units"
- SP911 Delete
- **SP919** Replace the words "packing method" with the words "packing instruction"
- **SP920** Replace "provision" with "provisions" (English only)
- **SP921** Replace "provision" with "provisions" (English only)
- **SP922** Replace "provision" with "provisions" (English only)
- **SP927** Replace "provision" with "provisions" (English only)
- SP929 Insert a full stop after the words "SEED CAKE, UN 2217" (English only)
- **SP930** Replace "provision" with "provisions" (English only)
- **SP931** Replace "provision" with "provisions" (English only)
- **SP937** Replace "provision" with "provisions" (English only)

- **SP939** Replace "provision" with "provisions" (English only)
- SP944 Delete
- SP951 Replace "packaging" with "container"
- SP952 Replace "packaging" with "container"
- **SP960** Insert "Not subject to the provisions of this Code but may be subject to provisions governing the transport of dangerous goods by other modes."

#### **Consequential Amendment:**

**Column (6)** Delete "911" for UN 1013

#### Chapter 3.4

**3.4.1** Replace "in column 7" with "in column 7a" (twice)

Replace "the word "None"" with "the quantity "0""

3.4.8.2 Delete

#### Chapter 3.5

Insert new Chapter 3.5:

#### "Chapter 3.5

#### Dangerous goods packed in excepted quantities

#### **3.5.1** Excepted quantities

- **3.5.1.1** Excepted quantities of dangerous goods of certain classes, other than articles, meeting the provisions of this chapter are not subject to any other provisions of this Code except for:
  - .1 The training provisions in chapter 1.3;
  - .2 The classification procedures and packing group criteria in Part 2, Classification;
  - .3 The packaging provisions of 4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.4.1 and 4.1.1.6 in Part 4; and
  - .4 The provisions for documentation specified in chapter 5.4.

**Note:** In the case of radioactive material, the provisions for radioactive material in excepted packages in 1.5.1.5 apply.

**3.5.1.2** Dangerous goods which may be carried as excepted quantities in accordance with the provisions of this chapter are shown in column 7b of the dangerous goods list by means of an alphanumeric code as follows:

Code	Maximum net quantity per inner packaging (in grams for solids and ml	Maximum net quantity per outer packaging (in grams for solids and ml for liquids and gases, or sum of grams and ml								
	for liquids and gases)	in the case of mixed packaging)								
E0	Not permitted as Excepted Quantity									
E1	30	1000								
E2	30	500								
E3	30	300								
E4	1	500								
E5	1	300								

For gases, the volume indicated for inner packagings refers to the water capacity of the inner receptacle and the volume indicated for outer packagings refers to the combined water capacity of all inner packagings within a single outer packaging.

**3.5.1.3** Where dangerous goods in excepted quantities for which different codes are assigned are packaged together the total quantity per outer packaging shall be limited to that corresponding to the most restrictive code.

# 3.5.2 Packagings

- **3.5.2.1** Packagings used for the transport of dangerous goods in excepted quantities shall be in compliance with the following:
  - .1 There shall be an inner packaging and each inner packaging shall be constructed of plastic (when used for liquid dangerous goods it shall have a thickness of not less than 0.2 mm), or of glass, porcelain, stoneware, earthenware or metal (see also 4.1.1.2) and the closure of each inner packaging shall be held securely in place with wire, tape or other positive means; any receptacle having a neck with moulded screw threads shall have a leak proof threaded type cap. The closure shall be resistant to the contents;
  - .2 Each inner packaging shall be securely packed in an intermediate packaging with cushioning material in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents. The intermediate packaging shall completely contain the contents in case of breakage or leakage, regardless of package orientation. For liquid dangerous goods, the intermediate packaging shall contain sufficient absorbent material to absorb the entire contents of the inner packaging. In such cases, the absorbent material may be the cushioning material. Dangerous goods shall not react dangerously with cushioning, absorbent material and packaging material or reduce the integrity or function of the materials;

- .3 The intermediate packaging shall be securely packed in a strong, rigid outer packaging (wooden, fibre-board or other equally strong material);
- .4 Each package type shall be in compliance with the provisions in 3.5.3;
- .5 Each package shall be of such a size that there is adequate space to apply all necessary markings; and
- .6 Overpacks may be used and may also contain packages of dangerous goods or goods not subject to the provisions of this Code.

# 3.5.3 *Tests for packages*

- **3.5.3.1** The complete package as prepared for transport, with inner packagings filled to not less than 95% of their capacity for solids or 98% for liquids, shall be capable of withstanding, as demonstrated by testing which is appropriately documented, without breakage or leakage of any inner packaging and without significant reduction in effectiveness:
  - .1 Drops onto a rigid, non-resilient flat and horizontal surface from a height of 1.8 m:
    - (i) Where the sample is in the shape of a box, it shall be dropped in each of the following orientations:
      - flat on the base;
      - flat on the top;
      - flat on the longest side;
      - flat on the shortest side;
      - on a corner;
    - (ii) Where the sample is in the shape of a drum, it shall be dropped in each of the following orientations:
      - diagonally on the top chime, with the centre of gravity directly above the point of impact;
      - diagonally on the base chime;
      - flat on the side.
  - **Note:** Each of the above drops may be performed on different but identical packages.
  - .2 A force applied to the top surface for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 m (including the drop sample).

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**3.5.3.2** For the purposes of testing, the substances to be transported in the packaging may be replaced by other substances except where this would invalidate the results of the tests. For solids, when another substance is used, it shall have the same physical characteristics (mass, grain size, etc.) as the substance to be carried. In the drop tests for liquids, when another substance is used, its relative density (specific gravity) and viscosity shall be similar to those of the substance to be transported.

# 3.5.4 Marking of packages

**3.5.4.1** Packages containing excepted quantities of dangerous goods prepared in accordance with this chapter shall be durably and legibly marked with the mark shown below. The primary hazard class of each of the dangerous goods contained in the package shall be shown in the mark. Where the name of the consignor or consignee is not shown elsewhere on the package this information shall be included within the mark.



#### **Excepted quantities mark**

Hatching and symbol of the same colour, black or red, on white or suitable contrasting background

- \* The class shall be shown in this location.
- \*\* The name of the consignor or of the consignee shall be shown in this location if not shown elsewhere on the package.
- **3.5.4.2** The dimensions of the mark shall be a minimum of 100 mm x 100 mm.
- **3.5.4.3** An overpack containing dangerous goods in excepted quantities shall display the markings required by 3.5.4.1, unless such markings on packages within the overpack are clearly visible.

#### 3.5.5 Maximum number of packages in any cargo transport unit

**3.5.5.1** The number of packages containing dangerous goods packed in excepted quantities in any cargo transport unit shall not exceed 1,000.

#### 3.5.6 Documentation

**3.5.6.1** In addition to the provisions for documentation specified in chapter 5.4, the words "dangerous goods in excepted quantities" and the number of packages shall be included on the dangerous goods declaration together with the description of the shipment.

#### 3.5.7 Stowage

**3.5.7.1** Notwithstanding the stowage provisions indicated in the Dangerous Goods List, dangerous goods transported under the provisions of this chapter are allocated stowage category A.

#### 3.5.8 Segregation

- **3.5.8.1** The segregation provisions of chapter 7.2 are not applicable for packagings containing dangerous goods in excepted quantities or in relation to other dangerous goods.
- **3.5.8.2** The segregation provisions of chapter 7.2 are not applicable for different dangerous goods in excepted quantities in the same outer packaging provided that they do not react dangerously with each other (see 4.1.1.6

#### **Consequential amendments:**

#### **Contents page:**

#### Chapter 3.5 Insert "Chapter 3.5 Dangerous goods packed in excepted quantities

- 3.5.1 Excepted quantities
- 3.5.2 Packagings
- 3.5.3 Tests for packages
- 3.5.4 Marking of packages
- 3.5.5 Maximum number of packages in any cargo transport unit
- 3.5.6 Documentation
- 3.5.7 Stowage
- 3.5.8 Segregation"

#### PART 4

# Chapter 4.1

**4.1.1** Replace text of note with "For the packing of goods of classes 2, 6.2 and 7, the general provisions of this section only apply as indicated in 4.1.8.2 (class 6.2), 4.1.9.1.5 (class 7) and in the applicable packing instructions of 4.1.4 (P201 and LP02 for class 2 and P620, P621, P650, IBC620 and LP621 for class 6.2)."

#### 4.1.1.3 Insert "otherwise" before "provided"

Insert "However, IBCs manufactured before 1 January 2011 and conforming to a design type which has not passed the vibration test of 6.5.6.13 or which has not passed the drop test criteria of 6.5.6.9.5.4 may still be used." after "with the provisions of 6.1.5, 6.3.5, 6.5.6 or 6.6.5, as applicable."

- **4.1.1.16** Replace "class I" with "class 1" (English only)
- 4.1.2.2Number first paragraph "4.1.2.2.1"<br/>Number second paragraph "4.1.2.2.2"
- 4.1.2.2.1.2 Insert "and" after "... as appropriate;"
- 4.1.3.6.4 Replace "doivent" with "peuvent" after ", les recipients à pression" (French version)
- **4.1.4.1** P001/P002/P400/P401/P402/P403/P404/P410/P601/P602/P800

Replace "**Pressure receptacles** may be used provided that the general provisions of 4.1.3.6 are met." with "**Pressure receptacles**, provided that the general provisions of 4.1.3.6 are met"

- **P001 PP1** Replace "UN 1133, UN 1210, UN 1263 and UN 1866, packagings for substances of packing groups II and III in quantities of 5 *l* or less per metal or plastics" with "UN Nos. 1133, 1210, 1263 and 1866 and for adhesives, printing ink related materials, paints, paint related materials and resin solutions which are assigned to UN 3082, metal or plastics packagings for substances of packing groups II and III in quantities of 5 litres or less per"
- P001 PP6 Delete
- **P001 PP31** Replace "3207" with "3398 (PG II and III), 3399 (PG II and III)"
- **P001 PP81** Replace "hydrofluoric acid" with "hydrogen fluoride"
- P002 PP6 Delete
- **P003 PP17** Replace "packagings shall not exceed 55 kg net mass for fibreboard" with "packages shall not exceed 55 kg net mass for fibreboard packagings"

#### P003 - PP88 Delete

#### **P010** Insert **P010**:

P010	PACKING INSTRUC	P010 PACKING INSTRUCTION P010											
The following pack	agings are authorized, provided that	the general provisions of <b>4.1.1</b> and <b>4.1.3</b>											
are met:													
Combination pack	agings												
Inner packagings	Outer packagings	Maximum net mass (see 4.1.3.3)											
Glass 1 l	Drums												
Steel 40 <i>l</i>	steel (1A2)	400 kg											
	plastics (1H2)	400 kg											
	plywood (1D)	400 kg											
	fibre (1G)	400 kg											
	Boxes												
	steel (4A)	400 kg											
	natural wood (4C1, 4C2)	400 kg											
	plywood (4D)	400 kg											
	reconstituted wood (4F)	400 kg											
	fibreboard (4G)	400 kg											
	expanded plastics (4H1)	60 kg											
	solid plastics (4H2)	400 kg											
Single packagings		Maximum capacity (see 4.1.3.3)											
Drums													
steel, non-remov	able head (1A1)	450 <i>l</i>											
Jerricans													
steel, non-remov	able head (3A1)	60 <i>l</i>											
Composite packag	gings												
plastics receptac	le in steel drums (6HA1)	250 <i>l</i>											

**P099** Insert "for these goods" before "by the competent authority"

Insert "A copy of the competent authority approval shall accompany each consignment or the transport document shall include an indication that the packaging was approved by the competent authority." after "may be used (see 4.1.3.7)."

- P112 (a) Replace "removable-head" with "removable head" (English only)
- P114 (a) Replace "removable-head" with "removable head" (English only)
- P114(b) Insert "PP48 For UN 0508, metal packagings shall not be used."
- **P114(b) PP50** Replace "For UN 0160 and UN 0161" with "For UN Nos. 0160, 0161 and 0508"

Replace "required" with "necessary"

- P116 Replace "removable-head" with "removable head" (English only)
- P143 In the title, replace "provisions" with "provision" (English only)
- **P200(3)(b)** Replace "provided that the above criterion is met, except where special packing provision "o" applies" with:

"The use of test pressures and filling ratios other than those in the table is permitted, except where (4), special packing provision "o" applies, provided that:

- (i) the criterion of (4), special packing provision "r" is met when applicable; or
- (ii) the above criterion is met in all other cases."
- **P200(4)(k)** Replace "assemblies (groups)" with "groups"
- P200(4)(n) Replace paragraph with "Cylinders and individual cylinders in a bundle shall contain not more than 5 kg of the gas. When bundles containing UN 1045 Fluorine, compressed are divided into groups of cylinders in accordance with special packing provision "k" each group shall contain not more than 5 kg of the gas."
- **P200(4)(r)** Insert new provision "The filling ratio of this gas shall be limited such that, if complete decomposition occurs, the pressure does not exceed two thirds of the test pressure of the pressure receptacle."
- **P200(4)(z)** Insert "Mixtures containing UN 2192 germane, other than mixtures of up to 35% germane in hydrogen or nitrogen or up to 28% germane in helium or argon, shall be filled to a pressure such that, if complete decomposition of the germane occurs, two thirds of the test pressure of the pressure receptacle shall not be exceeded." after "may be transported in pressure drums."
- **Table 1**Replace "200" with "225" in column "Test pressure, bar\*" for UN 1660

Replace "50" with "33" in column "Maximum working pressure" for UN 1660

**Table 2**Insert "5.1" in column "Subsidiary risk" for UN 1017

Replace "1.02" with "0.064" in column "Filling ratio" for UN 2192

Insert ", r" in column "Special packing provisions" for UN 2192

Delete "d," in column "Special packing provisions" for UN 2203 (twice)

Insert ", r" in column "Special packing provisions" for UN 2676

Insert "200" in column "Test Pressure, bar<sup>\*</sup>" for UN 2189

Insert "1.08" in column "Filling ratio" for UN 2189

Replace values in column "Filling ratio":

UN No.	Name	Test pressure, bar	Filling ratio
1011	Butane	10	0.52
1013	Carbon dioxide	190	0.68
1013	Carbon dioxide	250	0.76
1020	Chloropentafluoroethane (R115)	25	1.05
1022	Chlorotrifluoromethane (R13)	250	1.11
1035	Ethane	120	0.30
1035	Ethane	300	0.40
1048	Hydrogen bromide	60	1.51
1080	Sulphur hexafluoride	70	1.06
1080	Sulphur hexafluoride	140	1.34
1080	Sulphur hexafluoride	160	1.38
1962	Ethylene	300	0.38
1973	R502	31	1.01
1976	Octafluorocyclobutane (RC318)	11	1.32
1982	Tetrafluoromethane (R14)	200	0.71
1982	Tetrafluoromethane (R14)	300	0.90
1984	Trifluoromethane (R23)	190	0.88
1984	Trifluoromethane (R23)	250	0.96
2035	1,1,1-trifluoroethane (R143a)	35	0.73
2036	Xenon	130	1.28
2193	Hexafluoroethane (R116)	200	1.13
2196	Tungsten hexafluoride	10	3.08
2198	Phosphorus pentafluoride	300	1.25
2424	Octafluoropropane (R218)	25	1.04
2454	Methyl fluoride (R41)	300	0.63
2599	R503	31	0.12
2599	R503	42	0.17
2599	R503	100	0.64

Replace values in columns "Test pressure" and "Filling ratio":

UN No.	Name	Test pres	ssure, bar	Filling ratio
		Existing	Amended	
1005	Ammonia, anhydrous	33	29	0.54
1018	Chlorodifluoromethane (R22)	29	27	Unchanged
1021	1-Chloro-1,2,2,2-tetrafluoroethane (R124)	12	11	Unchanged
1027	Cyclopropane	20	18	0.55
1028	Dichlorodifluoromethane (R12)	18	16	Unchanged
1030	1,1-Difluoroethane (R152a)	18	16	Unchanged
1053	Hydrogen sulphide	55	48	Unchanged

UN No.	Name	Test pre	Test pressure, bar				
		Existing	Amended				
1077	Propylene	30	27	Unchanged			
1079	Sulphur dioxide	14	12	Unchanged			
1978	Propane	25	23	0.43			
2204	Carbonyl sulphide	26	30	0.87			
2676	Stibine	20	200	0.49			
3159	1,1,1,2-Tetrafluoroethane (R134a)	22	18	1.05			
3220	Pentafluoroethane (R125)	36	35	0.87			
3296	Heptafluoropropane (R227)	15	13	1.21			
3338	R407A	36	32	Unchanged			
3339	R407B	38	33	Unchanged			
3340	R407C	35	30	Unchanged			

Insert new packing instruction P004:

P004	PACKING INSTRUCTION P00	)4
This instr	uction applies to UN Nos. 3473, 3476, 3477, 3478 and 3479	
The follo 4.1.1.3, 4	wing packagings are authorized provided the general provisions of 4.1.1.1, 4.1.1.2, 1.1.6 and 4.1.3 are met:	
(1) For leve	fuel cell cartridges, packagings conforming to the packing group II performance l; and	
(2) For pack trans shal mate may pack agai inad	fuel cell cartridges contained in equipment or packed with equipment, strong outer tagings. Large robust equipment (see 4.1.3.8) containing fuel cell cartridges may be sported unpackaged. When fuel cell cartridges are packed with equipment, they be packed in inner packagings or placed in the outer packaging with cushioning erial or divider(s) so that the fuel cell cartridges are protected against damage that be caused by the movement or placement of the contents within the outer taging. Fuel cell cartridges which are installed in equipment shall be protected nst short circuit and the entire system shall be protected against vertent operation.	•
P402 – PP3	B1 Replace "and 3207 (PGI)" with ", 3398 (PG I) and 3399 (PG I)"	
P404	Replace ", 3393 and 3461." with "and 3393."	
P404 – PP3	<b>31</b> Replace ", 3200 and 3461," with "and 3200,"	
P406	Insert " <b>PP48</b> For UN 3474, metal packagings shall not be used."	
P601(2)	Delete "or additionally, for UN 1744 only, in polyvinylidene fluoride (PVDI inner packagings,"	F)
P601	Delete PP82	

**P602** In the first sentence, insert a comma after the word "authorized" (English only)

- **P620** In the first sentence, insert a comma after the word "authorized" (English only)
- P620.1(i) Replace "watertight" with "leakproof"
- P620.1(ii) Replace "watertight" with "leakproof"
- P620.2 Delete "of adequate strength for its capacity, mass and intended use"
- **P620 2(b)** Replace "6.3.1.1" with "6.3.3"
- **P620 4** Insert "4 Alternative packagings for the transport of animal material may be authorized by the competent authority in accordance with the provisions of 4.1.3.7."
- P621 Delete "and the special provisions of 4.1.8" after "general provisions of 4.1.1 and 4.1.3"
- P650 In the diamond shaped mark, insert a space between "UN" and "3373"

#### P650 Insert "Additional requirement:

- (1) Alternative packagings for the transport of animal material may be authorized by the competent authority in accordance with the provisions of 4.1.3.7."
- P650 (4) Replace "package" with "packaging" in the last sentence
- **P650(6)** Replace "6.3.2.5" with "6.3.5.3"

Replace "6.3.2.2 to 6.3.2.4" with "6.3.5.2"

- **P800** Delete the colon at the end of the sentence (English only)
- **P801** Insert ", except 4.1.1.3," after "provisions of 4.1.1"

Replace "Part 6" with "part 6" (English and Spanish only)

Insert new packing instruction P804:

P804		PACKING INSTRUCTION P	804
This	instruc	tion applies to UN 1744.	
The are n	followi net and	ing packagings are authorized provided the general provisions of 4.1.1 and 4.1 the packagings are hermetically sealed:	1.3
(1)	Comb	ination packagings with a maximum gross mass of 25 kg, consisting of:	
-	one of filled held i vibrat metal the en 1A2, 1	r more glass inner packaging(s) with a maximum capacity of 1.3 litres each a to not more than 90% of their capacity, the closure(s) of which shall be physical n place by any means capable of preventing back-off or loosening by impact ion during transport, individually placed in: receptacles together with cushioning and absorbent material sufficient to absorbent receptacies of the glass inner packaging(s), further packed in: 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings	nd lly or orb s.
(2)	Comb packa materi 1N2, maxin of the by any vibrat	ination packagings consisting of metal or polyvinylidene fluoride (PVDF) inr gings, not exceeding 5 litres in capacity individually packed with absorbe ial sufficient to absorb the contents and inert cushioning material in 1A2, 1E 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with num gross mass of 75 kg. Inner packagings shall not be filled to more than 90 ir capacity. The closure of each inner packaging shall be physically held in pla y means capable of preventing back-off or loosening of the closure by impact ion during transport.	ner ent 32, 1 a )% ace or
(3)	Packa	gings consisting of:	
	Outer	packagings:	
	Steel or require ither intend	or plastic drums, removable head (1A2 or 1H2) tested in accordance with the terments in 6.1.5 at a mass corresponding to the mass of the assembled packa as a packaging intended to contain inner packagings, or as a single packagiled to contain solids or liquids, and marked accordingly;	est ige ng
	Inner	packagings:	
	Drum: requir	s and composite packagings (1A1, 1B1, 1N1, 1H1 or 6HA1) meeting t rements of chapter 6.1 for single packagings, subject to the following conditions:	the :
	(a)	The hydraulic pressure test shall be conducted at a pressure of at least 300 k (3 bar) (gauge pressure);	Pa
	(b)	The design and production leakproofness tests shall be conducted at a to pressure of 30 kPa (0,3 bar);	est
	(c)	They shall be isolated from the outer drum by the use of inert shock-mitigati cushioning material which surrounds the inner packaging on all sides;	ng
	(d)	Their capacity shall not exceed 125 litres;	

P804		PACKING INSTRUCTION	P804	
(e)	Clos	ures shall be of a screw type that are:		
	(i)	Physically held in place by any means capable of preventing back-of loosening of the closure by impact or vibration during transport;	f or	
	(ii)	Provided with a cap seal;		
(f)	) The outer and inner packagings shall be subjected periodically to an interinspection and leakproofness test according to (b) at intervals of not more than and a half years; and			
(g)	The	outer and inner packagings shall bear in clearly legible and durable character	s:	
	(i)	the date (month, year) of the initial test and the latest periodic test inspection of the inner packaging; and	and	
	(ii)	the name or authorized symbol of the expert performing the tests inspections.	and	
(4) Pr	essure	e receptacles, provided that the general provisions of 4.1.3.6 are met.		
(a)	(a) They shall be subjected to an initial test and periodic tests every 10 year pressure of not less than 1 MPa (10 bar) (gauge pressure);		at a	
(b)	They at int	y shall be subjected periodically to an internal inspection and leakproofness tervals of not more than two and a half years;	test	
(c)	They	may not be equipped with any pressure relief device;		
(d)	(d) Each pressure receptacle shall be closed with a plug or valve(s) fitted w secondary closure device; and		th a	
(e)	e) The materials of construction for the pressure receptacle, valves, plugs, outlet cap luting and gaskets shall be compatible with each other and with the contents.			
P903	]	Replace "UN 3090 and UN 3091." with "UN Nos. 3090, 3091, 3480 and 348	1."	
	]	Delete "lithium" before "cells and batteries" (twice)		
P904		Replace "Part 6" with "part 6" (English and Spanish only)		
4.1.4.2				
IBC01	]	Delete the Additional provision		

**IBC02** Delete the *Additional provision* 

Insert "B15 For UN 2031 with more than 55% nitric acid, the permitted use of rigid plastics IBCs and of composite IBCs with a rigid plastics inner receptacle shall be two years from their date of manufacture."

- **IBC03** Delete the *Additional provision*
- **IBC03(B11)** Insert "Notwithstanding the provisions of 4.1.1.10 " before "UN 2672 amonia solution"
- **IBC05(B2)** Delete "packing group II"
- **IBC06(B2)** Delete "packing group II"
- **IBC07(B2)** Delete "packing group II"
- **IBC08(B2)** Delete "packing group II"
- **IBC99** Insert "for these goods" before "by the competent authority"

Insert "A copy of the competent authority approval shall accompany each consignment or the transport document shall include an indication that the packaging was approved by the competent authority." after "competent authority may be used (see 4.1.3.7)."

**IBC520** Replace "32%" with "37%" for UN 3109 – tert-Butyl peroxy-3, 5, 5-trimethylhexanoate, not more than 32% in diluent type A (third entry)

Replace "52%" with "62%" for UN 3119 – Di-(2-ethylhexyl) peroxydicarbonate, not more than 52%, stable dispersion, in water (eleventh entry)

**IBC520** Delete "and the special provisions of 4.1.8"

Insert new entries:

UN	Organic peroxide	Type of	Maximum	Control	Emergency
No.		IBC	quantity	temperature	temperature
			(litres)		
3109	tert-Butyl peroxybenzoate, not more than	31A	1250		
	32% in diluent type A				
3109	1,1-Di-(tert-Butylperoxy)cyclohexane, not	31A	1250		
	more than 37% in diluent type A				
3119	tert-Amyl peroxypivalate, not more than	31A	1250	+10	+15
	32% in diluent type A				
3119	tert-Butyl peroxyneodecanoate, not more	31A	1250	-5	+5
	than 52%, stable dispersion, in water				
3119	Di-(2-neodecanoylperoxyisopropyl)benzene,	31A	1250	-15	-5
	not more than 42%, stable dispersion, in				
	water				
3119	3-Hydroxy-1,1-dimethylbutyl	31A	1250	-15	-5
	peroxy-neodecanoate, not more than 52%,				
	stable dispersion, in water				

4.1.4.3

- **LP01** In the first sentence, insert a comma after the word "authorized" (English only)
- **LP02** In the first sentence, insert a comma after the word "authorized" (English only)

Bring words and figures to the centre of columns in column 3

**LP99** Insert "for these goods" before "by the competent authority"

Insert "A copy of the competent authority approval shall accompany each consignment or the transport document shall include an indication that the packaging was approved by the competent authority" after "**competent authority may be used (see 4.1.3.7)**."

- **LP621** Delete "and the special provisions of 4.1.8"
- **4.1.6** Amend the heading to read: "Special packing provisions for goods of class 2"
- **4.1.6.1.2** Delete "Pressure receptacles for UN 1001 acetylene ... compatible with the pressure receptacles."
- **4.1.7.4.1** Delete first round bracket after "2.4.2.3.2.3" (English only)
- 4.1.8 Replace "(class 6.2)" with "of Category A (class 6.2, UN 2814 and UN 2900)"
- **4.1.8.2** Replace "liquids shall be filled into packagings, including IBCs, which" with "liquids shall only be filled into packagings which"
- **4.1.8.3** Delete "For UN 2814 and UN 2900," and "and assignment to UN 2814 or UN 2900"
- 4.1.8.4 Delete "thoroughly"

Insert "to nullify any hazard" after "sterilized"

- **4.1.8.5** Replace with the text of existing 6.3.2.8
- **4.1.9.1.1** Replace "2.7.7.1." with "2.7.2.2, 2.7.2.4.1, 2.7.2.4.4, 2.7.2.4.5, 2.7.2.4.6 and 4.1.9.3

The types of packages for radioactive materials covered by the provisions of this Code are:

- .1 Excepted package (see 1.5.1.5);
- .2 Industrial package Type 1 (Type IP-1 package);
- .3 Industrial package Type 2 (Type IP-2 package);

- .4 Industrial package Type 3 (Type IP-3 package);
- .5 Type A package;
- .6 Type B(U) package;
- .7 Type B(M) package;
- .8 Type C package.

Packages containing fissile material or uranium hexafluoride are subject to additional requirements."

Replace section 4.1.9.1.6 with:

- "4.1.9.1.6 Before the first shipment of any package, the following provisions shall be fulfilled:
  - .1 If the design pressure of the containment system exceeds 35 kPa (gauge), it shall be ensured that the containment system of each package conforms to the approved design requirements relating to the capability of that system to maintain its integrity under that pressure;
  - .2 For each Type B(U), Type B(M) and Type C package and for each package containing fissile material, it shall be ensured that the effectiveness of its shielding and containment and, where necessary, the heat transfer characteristics and the effectiveness of the confinement system, are within the limits applicable to or specified for the approved design;
  - .3 For packages containing fissile material, where, in order to comply with the requirements of 6.4.11.1, neutron poisons are specifically included as components of the package, checks shall be performed to confirm the presence and distribution of those neutron poisons.
- **4.1.9.1.7** Before each shipment of any package, the following provisions shall be fulfilled:
  - .1 For any package it shall be ensured that all the provisions specified in the relevant provisions of this Code have been satisfied;
  - .2 It shall be ensured that lifting attachments which do not meet the requirements of 6.4.2.2 have been removed or otherwise rendered incapable of being used for lifting the package, in accordance with 6.4.2.3;
  - .3 For each package requiring competent authority approval, it shall be ensured that all the requirements specified in the approval certificates have been satisfied;

- .4 Each Type B(U), Type B(M) and Type C package shall be held until equilibrium conditions have been approached closely enough to demonstrate compliance with the requirements for temperature and pressure unless an exemption from these requirements has received unilateral approval;
- .5 For each Type B(U), Type B(M) and Type C package, it shall be ensured by inspection and/or appropriate tests that all closures, valves, and other openings of the containment system through which the radioactive contents might escape are properly closed and, where appropriate, sealed in the manner for which the demonstrations of compliance with the requirements of 6.4.8.8 and 6.4.10.3 were made;
- .6 For each special form radioactive material, it shall be ensured that all the provisions specified in the approval certificate and the relevant provisions of these Regulations have been satisfied;
- .7 For packages containing fissile material the measurement specified in 6.4.11.4 (b) and the tests to demonstrate closure of each package as specified in 6.4.11.7 shall be performed where applicable;
- .8 For each low dispersible radioactive material, it shall be ensured that all the requirements specified in the approval certificate and the relevant provisions of these Regulations have been satisfied.
- **4.1.9.1.8** The consignor shall also have a copy of any instructions with regard to the proper closing of the package and any preparation for shipment before making any shipment under the terms of the certificates.
- **4.1.9.1.9** Except for consignments under exclusive use, the transport index of any package or overpack shall not exceed 10, nor shall the criticality safety index of any package or overpack exceed 50.
- **4.1.9.1.10** Except for packages or overpacks transported under exclusive use by rail or by road under the conditions specified in 7.1.14.7.1, or under exclusive use and special arrangement by ship under the conditions specified in 7.1.14.9, the maximum radiation level at any point on any external surface of a package or overpack shall not exceed 2 mSv/h.
- **4.1.9.1.11** The maximum radiation level at any point on any external surface of a package or overpack under exclusive use shall not exceed 10 mSv/h.
- **4.1.9.1.12** Pyrophoric radioactive material shall be packaged in Type A, Type B(U), Type B(M) or Type C packages and shall also be suitably inerted."
- 4.1.9.3 Insert new section:

#### **"4.1.9.3 Packages containing fissile material**

Unless not classified as fissile in accordance with 2.7.2.3.5, packages containing fissile material shall not contain:

- .1 A mass of fissile material different from that authorized for the package design;
- .2 Any radionuclide or fissile material different from those authorized for the package design; or
- .3 Contents in a form or physical or chemical state, or in a spatial arrangement, different from those authorized for the package design,

as specified in their certificates of approval where appropriate."

# Chapter 4.2

**4.2.0.1** Delete "IMO type portable tanks and road tank vehicles may continue to be constructed in accordance with the provisions of the IMDG Code in force on 1 July 1999 (amendment 29) until 1 January 2003."

Replace "Tanks certified and approved prior to 1 January 2003" with "IMO type portable tanks and road tank vehicles certified and approved prior to 1 January 2003 in accordance with the provisions of the IMDG Code in force on 1 July 1999 (amendment 29)"

Delete "However, the provisions of column (12) may be used instead of the provisions of column (13) until 1 January 2010."

**4.2.1.13.8** Insert "**Note:** An example of a method to determine the size of emergency-relief devices is given in Appendix 5 of the Manual of Tests and Criteria."

# 4.2.5.2.6

**T23** Insert "or type B" after "type A" for UN 3119 - Di-(3, 5, 5-trimethylhexanoyl) peroxide, not more than 38% in diluent type A

Insert new entry:

UN No	Substance	Min. test pressure (bar)	Min. shell thickness (mm- reference steel)	Bottom opening requirements	Pressure- relief requirements	Degree of filling	Control temp.	Emergency temp.
3119	tert-Amyl peroxyneodecanoate, not more than 47% in diluent type A						-10	-5

# 4.2.5.3

- TP12 Delete
- **TP13** Replace "is transported." With "is transported, unless no self-contained breathing apparatus, as required by SOLAS regulation II-2/19 (II-2/54), is onboard"
- **TP35** Insert "Portable tank instruction T14 may continue to be applied until 31 December 2014."

# Chapter 4.3

- **4.3.2.4** Delete "waste"
- 4.3.2.4.1 Replace "Bulk waste goods of class 6.2 (UN Nos. 2814 and 2900 (animal carcasses only))" with "Transport in bulk containers of animal material of class 6.2"

Insert "Animal material containing infectious substances (UN Nos. 2814, 2900 and 3373) is authorized for transport in bulk containers provided the following conditions are met:" before ".1 closed bulk containers ..."

- 4.3.2.4.1.2 Replace "Waste goods UN 2814 and 2900" with "The animal material"
- **4.3.2.4.1.3** Delete "used for the transport of waste goods UN 2814 and 2900"

Insert "**Note:** Additional provisions may be required by appropriate national health authorities."

#### PART 5

#### Chapter 5.1

- **5.1.2.1** Insert ", except as required in 5.2.2.1.12." after "in the overpack are visible."
- **5.1.3.2** Replace "Tanks and intermediate bulk containers" with "Packagings, including IBCs, and tanks"
- **5.1.5** Delete "**Note:** The provisions of chapter 5.2 apply to all class 7 packages as defined in 2.7.2."
- **5.1.5.1** Delete paragraph 5.1.5.1

#### **Consequential amendments:**

**5.1.5.1** Renumber paragraphs 5.1.5.2 to 5.1.5.3.3

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- **5.1.5.2.1** Replace "5.1.5.2.2", "5.1.5.2.3" and "5.1.5.2.4" with "5.1.5.1.2", "5.1.5.1.3" and "5.1.5.1.4"
- **6.4.22.2** Replace "5.1.5.3.1" with "5.1.5.2.1"
- **6.4.22.3** Replace "5.1.5.3.1" with "5.1.5.2.1"
- **6.4.23.2** Replace "5.1.5.3.1" with "5.1.5.2.1"
- **6.4.23.14(h)** Replace "5.1.5.2.2" with "5.1.5.1.2"

5.1.5.2.2 (current 5.1.5.3.2)

Delete "The consignor shall also have a copy of any instructions with regard to the proper closing of the package and any preparation for shipment before making any shipment under the terms of the certificates."

5.1.5.3 Insert new section:

#### **"5.1.5.3 Determination of transport index (TI) and criticality safety index (CSI)**

- **5.1.5.3.1** The transport index (TI) for a package, overpack or freight container, or for unpackaged LSA-I or SCO-I, shall be the number derived in accordance with the following procedure:
  - .1 Determine the maximum radiation level in units of millisieverts per hour (mSv/h) at a distance of 1 m from the external surfaces of the package, overpack, freight container, or unpackaged LSA-I and SCO-I. The value determined shall be multiplied by 100 and the resulting number is the transport index. For uranium and thorium ores and their concentrates, the maximum radiation level at any point 1 m from the external surface of the load may be taken as:
    - 0.4 mSv/h for ores and physical concentrates of uranium and thorium;
    - 0.3 mSv/h for chemical concentrates of thorium;
    - 0.02 mSv/h for chemical concentrates of uranium, other than uranium hexafluoride;
  - .2 For tanks, freight containers and unpackaged LSA-I and SCO-I, the value determined in 5.1.5.3.1.1 above shall be multiplied by the appropriate factor from Table 5.1.5.3.1;
  - .3 The value obtained in 5.1.5.3.1.1 and 5.1.5.3.1.2 above shall be rounded up to the first decimal place (e.g., 1.13 becomes 1.2), except that a value of 0.05 or less may be considered as zero.

Size of load <sup>a</sup>	Multiplication factor
size of load $\leq 1 \text{ m}^2$	1
$1 \text{ m}^2 < \text{size of load} \le 5 \text{ m}^2$	2
$5 \text{ m}^2 < \text{size of load} \le 20 \text{ m}^2$	3
$20 \text{ m}^2 < \text{size of load}$	10

# Table 5.1.5.3.1:Multiplication factors for tanks, freight containers<br/>and unpackaged LSA-I and SCO-I

- <sup>a</sup> Largest cross-sectional area of the load being measured.
- **5.1.5.3.2** The transport index for each overpack, freight container or conveyance shall be determined as either the sum of the TIs of all the packages contained, or by direct measurement of radiation level, except in the case of non-rigid overpacks for which the transport index shall be determined only as the sum of the TIs of all the packages.
- **5.1.5.3.3** The criticality safety index for each overpack or freight container shall be determined as the sum of the CSIs of all the packages contained. The same procedure shall be followed for determining the total sum of the CSIs in a consignment or aboard a conveyance.
- **5.1.5.3.4** Packages and overpacks shall be assigned to either category I-WHITE, II-YELLOW or III-YELLOW in accordance with the conditions specified in Table 5.1.5.3.4 and with the following requirements:
  - .1 For a package or overpack, both the transport index and the surface radiation level conditions shall be taken into account in determining which is the appropriate category. Where the transport index satisfies the condition for one category but the surface radiation level satisfies the condition for a different category, the package or overpack shall be assigned to the higher category. For this purpose, category I-WHITE shall be regarded as the lowest category;
  - .2 The transport index shall be determined following the procedures specified in 5.1.5.3.1 and 5.1.5.3.2;
  - .3 If the surface radiation level is greater than 2 mSv/h, the package or overpack shall be transported under exclusive use and under the provisions of 7.2.3.1.3, 7.2.3.2.1, or 7.2.3.3.3, as appropriate;
  - .4 A package transported under a special arrangement shall be assigned to category III-YELLOW except when otherwise specified in the competent authority approval certificate of the country of origin of design (see 2.7.2.4.6);

.5 An overpack which contains packages transported under special arrangement shall be assigned to category III-YELLOW except when otherwise specified in the competent authority approval certificate of the country of origin of design (see 2.7.2.4.6).

Table 5.1.5.3.4:	Categories	of packages and	overpacks
------------------	------------	-----------------	-----------

Conditions					
Transport index	Maximum radiation level at any point on external surface	Category			
$0^{\mathbf{a}}$	Not more than 0.005 mSv/h	I-WHITE			
More than 0 but not more than 1 <sup>a</sup>	More than $0.005 \text{ mSv/h}$ but not more than $0.5 \text{ mSv/h}$	II-YELLOW			
More than 1 but not more than 10	More than 0.5 mSv/h but not more than 2 mSv/h	III-YELLOW			
More than 10	More than 2 mSv/h but not more than 10 mSv/h	III-YELLOW <sup>b</sup>			

- <sup>a</sup> If the measured TI is not greater than 0.05, the value quoted may be zero in accordance with 5.1.5.3.1.3.
- <sup>b</sup> Shall also be transported under "exclusive use"."

# Chapter 5.2

- **5.2.1.5.2** Replace paragraph with "In the case of excepted packages marking the proper shipping name is not required."
- **5.2.1.6** Replace section with:
- **"5.2.1.6.1** Packages containing marine pollutants meeting the criteria of 2.10.3 shall be durably marked with the marine pollutant mark with the exception of single packagings and combination packagings containing inner packagings with:
  - contents of 5 *l* or less for liquids; or
    - contents of 5 kg or less for solids.
- **5.2.1.6.2** The marine pollutant mark shall be located adjacent to the markings required by 5.2.1.1. The provisions of 5.2.1.2 and 5.2.1.4 shall be met.
- **5.2.1.6.3** The marine pollutant mark shall be as shown below. For packagings, the dimensions shall be at least  $100 \text{ mm} \times 100 \text{ mm}$ , except in the case of packages of such dimensions that they can only bear smaller marks.

# Marine pollutant mark



Symbol (fish and tree): black on white or suitable contrasting background"

- **5.2.1.7** Delete "open" before "cryogenic receptacles intended for the transport of"
- **5.2.1.7.1(a)** Insert "except for cryogenic receptacles" after "pressure receptacles"
- **5.2.1.8** Insert new section:
- **"5.2.1.8 Excepted quantity mark**
- **5.2.1.8.1** Packages containing excepted quantities of dangerous goods shall be marked according to 3.5.4."
- **5.2.2.1.12.1** Replace "Except as provided for large freight containers and tanks in accordance with 5.3.1.1.5.1" with "Except when enlarged labels are used in accordance with 5.3.1.1.5.1"
- **5.2.2.1.12.2.4** Replace "See 2.7.6.1.1 and 2.7.6.1.2" with "The number determined in accordance with 5.1.5.3.1 and 5.1.5.3.2"
- **5.2.2.2.1.1** Replace "They shall have a line of the same colour as the symbol, 5 mm inside the edge and running parallel with it." with "They shall have a line 5 mm inside the edge and running parallel with it. In the upper half of a label the line shall have the same colour as the symbol and in the lower half it shall have the same colour as the figure in the bottom corner."
- **5.2.2.2.1.2** Replace "ISO 7225:1994" with "ISO 7225:2005" (twice)
- **5.2.2.1.3** Replace with "With the exception of divisions 1.4, 1.5 and 1.6 of class 1, the upper half of the label shall contain the pictorial symbol and the lower half shall contain the class number 1, 2, 3, 4, 4.1, 5.2, 6, 7, 8 or 9 as appropriate. The label may include text such as the UN number, or words describing the hazard class (e.g., "flammable") in accordance with 5.2.2.2.1.5 provided the text does not obscure or detract from the other label elements."
- **5.2.2.2.1.4** Replace "Except for divisions 1.4, 1.5 and 1.6, labels for class 1 show in the lower half" with "In addition, except for divisions 1.4, 1.5 and 1.6, labels for class 1 shall show in the lower half, above the class number,"

Replace "Labels for divisions 1.4, 1.5 and 1.6 show in the upper half the division number and in the lower half the" with "Labels for divisions 1.4, 1.5 and 1.6 shall show in the upper half the division number and in the lower half the class number and the"

# 5.2.2.2.1.6.3 Renumber as "5.2.2.2.1.6.4"

Insert "the class 5.2 label, where the symbol may be shown in white; and"

#### **Consequential amendments:**

**5.2.2.2.2** Replace "5.2.2.2.1.6.3" with "5.2.2.2.1.6.4" for class 2.1



**5.2.2.1.6.2** Delete "and" after "... where they may be shown in white;"

#### Chapter 5.3

- **5.3.1.2.1.1** Delete "of the same colour as the symbol"
- **5.3.1.2.1.1** Replace ";" with ". In the upper half of the placard the line shall have the same colour as the symbol and in the lower half it shall have the same colour as the figure in the bottom corner."
- **5.3.2.1.2.1** Replace "against a white background in the lower half of each primary hazard class placard; or" with "against a white background in the area below the pictorial symbol and above the class number and the compatibility group letter in a manner that does not obscure or detract from the other required label elements (see 5.3.2.1.3); or"
**5.3.2.3** Replace "The mark shall conform to 5.2.1.6.3 and shall have sides of at least 250 mm." with "The mark shall conform to the specifications given in 5.2.1.6.3, and shall have minimum dimensions of 250 mm x 250 mm."

#### Chapter 5.4

**5.4.1.2.5** Replace footnote with "<sup>1</sup> For standardized formats, see also the relevant recommendations of the UNECE United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT), in particular Recommendation No.1 (United Nations Lay-out Key for Trade Documents) (ECE/TRADE/137, edition 81.3), UN Layout Key for Trade Documents – Guidelines for Applications (ECE/TRADE/270, edition 2002), Recommendation No.11 (Documentary Aspects of the International Transport of Dangerous Goods).

(ECE/TRADE/204, edition 96.1 – currently under revision) and Recommendation No.22 (Lay-out Key for standard Consignment Instructions) (ECE/TRADE/168, edition 1989). Refer also to the UN/CEFACT Summary of Trade Facilitation Recommendations (ECE/TRADE/346, edition 2006) and the United Nations Trade Data Elements Directory (UNTDED) (ECE/TRADE/362, edition 2005)."

- **5.4.1.4.4** Delete ", n.o.s." for UN 2761
- **5.4.1.5.2.1** Replace "in column 7" with "in column 7a"
- **5.4.1.5.11.1** Replace paragraph with "For substances, mixtures, solutions or preparations classified under N.O.S. entries not included in the segregation groups listed in 3.1.4.4 but belonging, in the opinion of the consignor, to one of these groups (see 3.1.4.2), the appropriate segregation group name preceded by the phrase "IMDG Code segregation group" shall be included in the transport document after the dangerous goods description. For example:

"UN 1760 CORROSIVE LIQUID, N.O.S. (Phosphoric acid) 8 III IMDG Code segregation group – 1 Acids"

5.4.1.5.13 Insert new paragraph "5.4.1.5.13":

# **"5.4.1.5.13** Transport of IBCs or portable tanks after the date of expiry of the last periodic test or inspection

For transport in accordance with 4.1.2.2.2.2, 6.7.2.19.6.2, 6.7.3.15.6.2 or 6.7.4.14.6.2, a statement to this effect shall be included in the transport document, as follows: "Transport in accordance with 4.1.2.2.2.2", "Transport in accordance with 6.7.3.15.6.2" or "Transport in accordance with 6.7.4.14.6.2" as appropriate."

Insert new section:

### **"5.4.1.5.14 Dangerous goods in excepted quantities**

- **5.4.1.5.14.1** When dangerous goods are transported according to the exceptions for dangerous goods packed in excepted quantities provided for in column 7b of the Dangerous Goods List and chapter 3.5, the words "dangerous goods in excepted quantities" shall be included."
- **5.4.2.2** Insert "Facsimile signatures are acceptable where applicable laws and regulations recognize the legal validity of facsimile signatures." after "shall be identified on the document."
- **5.4.2.3** Insert new paragraph "**5.4.2.3**":
- "5.4.2.3 If the dangerous goods documentation is presented to the carrier by means of electronic data processing (EDP) or electronic data interchange (EDI) transmission techniques, the signature(s) may be replaced by the name(s) (in capitals) of the person authorized to sign."
- **5.4.5.1** Insert a full stop at the end of the note, after "tanks" (English only)

#### PART 6

#### Chapter 6.1

- **6.1.1.3** Insert "Note: ISO 16106:2006 "Packaging Transport packages for dangerous goods Dangerous goods packagings, intermediate bulk containers (IBCs) and large packagings Guidelines for the application of ISO 9001" provides acceptable guidance on procedures which may be followed." after "packaging meets the provisions of this chapter."
- 6.1.2.6 Insert "Note: *Plastics materials,* is taken to include other polymeric materials such as rubber." after "Glass, porcelain or stoneware"
- **6.1.3.1(a)** Replace "This shall not be used for any purpose other than certifying that a packaging complies with the relevant provisions of this chapter." with "This symbol shall not be used for any purpose other than certifying that a packaging complies with the relevant requirements in chapter 6.1, 6.2, 6.3, 6.5 or 6.6."
- **6.1.5.1.2** Replace "Tests shall be successfully performed on each packaging design type before such packaging is used." with "Each packaging design type shall successfully pass the tests prescribed in this chapter before being used."

6.1.5.3.4 Replace "The target shall be a rigid, non-resilient, flat and horizontal surface." with:

# "Target

The target shall be a non-resilient and horizontal surface and shall be:

- .1 Integral and massive enough to be immovable;
- .2 Flat with a surface kept free from local defects capable of influencing the test results;
- .3 Rigid enough to be non-deformable under test conditions and not liable to become damaged by the tests; and
- .4 Sufficiently large to ensure that the test package falls entirely upon the surface."

# Chapter 6.2

# TitleReplace "and small receptacles containing gas (gas cartridges)" with ", small<br/>receptacles containing gas (gas cartridges) and fuel cell cartridges containing<br/>liquefied flammable gas"

- 6.2.1 Replace "and small receptacles containing gas (gas cartridges)" with ", small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas"
- **6.2.1.1.6** Replace "Manifolds shall be designed such that they are protected from impact." with "Manifold assemblies (e.g., manifold, valves, and pressure gauges) shall be designed and constructed such that they are protected from impact damage and forces normally encountered in transport. Manifolds shall have at least the same test pressure as the cylinders."

Replace "means shall be provided" with "each pressure receptacle shall have an isolation valve"

# 6.2.1.1.9 Insert "Additional requirements for the construction of pressure receptacles for acetylene".

Pressure receptacles for UN 1001 acetylene, dissolved, and UN 3374 acetylene, solvent free, shall be filled with a porous material, uniformly distributed, of a type that conforms to the requirements and testing specified by the competent authority and which:

.1 is compatible with the pressure receptacle and does not form harmful or dangerous compounds either with the acetylene or with the solvent in the case of UN 1001; and

.2 is capable of preventing the spread of decomposition of the acetylene in the porous material.

In the case of UN 1001, the solvent shall be compatible with the pressure receptacles."

- **6.2.1.3.1** Replace "Except for pressure relief devices, valves, piping, fittings and other equipment subjected to pressure shall be designed and constructed to withstand at least 1.5 times the test pressure of the pressure receptacles." with "Valves, piping and other fittings subjected to pressure, excluding pressure relief devices, shall be designed and constructed so that the burst pressure is at least 1.5 times the test pressure receptacle."
- **6.2.1.6.1.5** Insert new paragraph ".5 Check of service equipment, other accessories and pressure-relief devices, if to be reintroduced into service."
- **6.2.1.6.2** Replace paragraph with "Pressure receptacles intended for the transport of UN 1001 acetylene, dissolved and UN 3374 acetylene, solvent free, shall be examined only as specified in 6.2.1.6.1.1, 6.2.1.6.3 and 6.2.1.6.1.5. In addition the condition of the porous material (e.g., cracks, top clearance, loosening, or settlement) shall be examined."
- **6.2.2.1.3** Delete "ISO 11118:1999 Gas cylinders Non-refillable metallic gas cylinders Specification and test methods"
- **6.2.2.2** Insert after the table "**Note:** The limitations imposed in ISO 11114-1 on high strength steel alloys at ultimate tensile strength levels up to 1 100 MPa do not apply to SILANE (UN 2203)." after "Part 2: Non-metallic materials"
- 6.2.2.4 Replace "ISO 6406:1992 Periodic inspection and testing of seamless steel gas cylinders" with "ISO 6406:2005 Seamless steel gas cylinders Periodic inspection and testing"

Replace "ISO 10461:1993" with "ISO 10461:2005/A1:2006"

Replace "ISO 10462:1994 Cylinders for dissolved acetylene – Periodic inspection and maintenance" with "ISO 10462:2005 Transportable cylinders for dissolved acetylene – Periodic inspection and maintenance"

- **6.2.2.7.1 Replace** "This symbol shall only be marked on pressure receptacles which conform to the provisions of this Code for UN pressure receptacles." with "This symbol shall not be used for any purpose other than certifying that a packaging complies with the relevant requirements in chapter 6.1, 6.2, 6.3, 6.5 or 6.6."
- 6.2.4 Replace "and small receptacles containing gas (gas cartridges)" with ", small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas"
- 6.2.4.1 Insert "and fuel cell cartridges containing liquefied flammable gas" after "(gas cartridges)"

6.2.4.1.1 Insert "or fuel cell cartridge" after "Each receptacle"

Insert "or the fuel cell cartridge" after "95% of the capacity of the receptacle"

Insert "or the fuel cell cartridges" after "or if the receptacles"

Insert "or fuel cell cartridge" after "but in addition one receptacle"

- 6.2.4.1.2 Insert "or fuel cell cartridge" after "receptacle" (twice)
- 6.2.4.2.2.3 Replace "weight" with "mass"

#### **Consequential amendments:**

#### **Contents page:**

- **Chapter 6.2** Replace "and small receptacles containing gas (gas cartridges)" with ", small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas"
- **6.2.1.4** Renumber "6.2.1.4" as "6.2.1.5"

Renumber "6.2.1.4.1" as "6.2.1.5.1"

Renumber "6.2.1.4.2" as "6.2.1.5.2"

**6.2.1.5** Renumber "6.2.1.5" as "6.2.1.6"

Renumber "6.2.1.5.1" as "6.2.1.6.1"

Renumber "6.2.1.5.1" as "6.2.1.6.2"

**6.2.1.6** Renumber "6.2.1.6" as "6.2.1.4"

Renumber "6.2.1.6.1" as "6.2.1.4.1"

Renumber "6.2.1.6.1" as "6.2.1.4.2"

- 6.2.4 Replace "and small receptacles containing gas (gas cartridges)" with ", small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas"
- **4.1.6.1.4** Replace "6.2.1.5" with "6.2.1.6"
- **4.1.6.1.10** Replace "6.2.1.5" with "6.2.1.6"
- **4.2.4.2** Replace "6.2.1.5" with "6.2.1.6"

6.2.1.4.2	Replace "6.2.1.4.1.1" with "6.2.1.5.1.1"
	Replace "6.2.1.4.1.2" with "6.2.1.5.1.2"
	Replace "6.2.1.4.1.4" with "6.2.1.5.1.4"
	Replace "6.2.1.4.1.6" with "6.2.1.5.1.6"
	Replace "6.2.1.4.1.7" with "6.2.1.5.1.7"
	Replace "6.2.1.4.1.8" with "6.2.1.5.1.8"
	Replace "6.2.1.4.1.9" with "6.2.1.5.1.9"

**6.7.5.12.4** Replace "6.2.1.5" with "6.2.1.6"

# Chapter 6.3

# Title Replace "substances" with "infectious substances of category A"

- **6.3.1.1** Replace paragraph with "The provisions of this chapter apply to packagings intended for the transport of infectious substances of Category A."
- 6.3.1.2 Delete
- 6.3.1.3 Delete
- **6.3.2** Replace section with:
- **"6.3.2 Provisions for packagings**
- **6.3.2.1** The provisions for packagings in this section are based on packagings, as specified in 6.1.4, currently used. In order to take into account progress in science and technology, there is no objection to the use of packagings having specifications different from those in this chapter provided that they are equally effective, acceptable to the competent authority and able successfully to withstand the tests described in 6.3.5. Methods of testing other than those described in the provisions of this Code are acceptable provided they are equivalent.
- **6.3.2.2** Packagings shall be manufactured and tested under a quality assurance programme which satisfies the competent authority in order to ensure that each packaging meets the provisions of this chapter.

**Note:** ISO 16106:2006 "Packaging – Transport packages for dangerous goods – Dangerous goods packagings, intermediate bulk containers (IBCs) and large packagings – Guidelines for the application of ISO 9001" provides acceptable guidance on procedures which may be followed."

- **6.3.2.3** Insert text of existing 6.3.1.3
- **6.3.3** Replace section with:

# **"6.3.3 Code for designating types of packagings**

- **6.3.3.1** The codes for designating types of packagings are set out in 6.1.2.7.
- **6.3.3.2** The letters "U" or "W" may follow the packaging code. The letter "U" signifies a special packaging conforming to the provisions of 6.3.5.1.6. The letter "W" signifies that the packaging, although, of the same type indicated by the code is manufactured to a specification different from that in 6.1.4 and is considered equivalent under the provisions of 6.3.2.1."

Insert new sections 6.3.4 and 6.3.5:

# "6.3.4 Marking

**Note 1**: The marking indicates that the packaging which bears it corresponds to a successfully tested design type and that it complies with the provisions of this chapter which are related to the manufacture, but not to the use, of the packaging.

**Note 2**: The marking is intended to be of assistance to packaging manufacturers, reconditioners, packaging users, carriers and regulatory authorities.

**Note 3**: The marking does not always provide full details of the test levels, etc., and these may need to be taken further into account, e.g., by reference to a test certificate, to test reports or to a register of successfully tested packagings.

- **6.3.4.1** Each packaging intended for use according to the provisions of this Code shall bear markings which are durable, legible and placed in a location and of such a size relative to the packaging as to be readily visible. For packages with a gross mass of more than 30 kg, the markings or a duplicate thereof shall appear on the top or on a side of the packaging. Letters, numerals and symbols shall be at least 12 mm high, except for packagings of 30 litres or 30 kg capacity or less, when they shall be at least 6 mm in height and for packagings of 5 litres or 5 kg or less when they shall be of an appropriate size.
- **6.3.4.2** Insert text of existing 6.3.1.1 with the following modifications:

Replace "6.3.2" with "6.3.5"

**6.3.4.2(a)** Replace "the United Nations Packaging symbol;" with "the United Nations Packaging symbol. This symbol shall not be used for any purpose other than certifying that a packaging complies with the relevant provisions in chapter 6.1, 6.2, 6.3, 6.5 or 6.6;"

- **6.3.4.2(g)** Replace "6.3.2.9" with "6.3.5.1.6"
- **6.3.4.2(h)** Delete "shall be clearly separated, such as by a slash or space, so as to be easily identifiable" after "with subparagraphs (a) to (g)"
- **6.3.4.3** Marking shall be applied in the sequence shown in 6.3.4.2 (a) to (g); each element of the marking required in these sub-paragraphs shall be clearly separated, e.g., by a slash or space, so as to be easily identifiable. For examples, see 6.3.4.4

Any additional markings authorized by a competent authority shall still enable the parts of the mark to be correctly identified with reference to 6.3.4.1

**6.3.4.4** Insert text of existing 6.3.1.2 with the following modifications:

Replace "4G/CLASS 6.2/01" with "4G/CLASS 6.2/06"

Replace "6.3.1.1" with "6.3.4.2" (twice)

**6.3.5** Insert heading of existing 6.3.2

#### 6.3.5.1 **Performance and frequency of tests**

- **6.3.5.1.1** The design type of each packaging shall be tested as provided in this section in accordance with procedures established by the competent authority.
- **6.3.5.1.2** Each packaging design type shall successfully pass the tests prescribed in this chapter before being used. A packaging design type is defined by the design, size, material and thickness, manner of construction and packing, but may include various surface treatments. It also includes packagings which differ from the design type only in their lesser design height.
- **6.3.5.1.3** Tests shall be repeated on production samples at intervals established by the competent authority.
- **6.3.5.1.4** Tests shall also be repeated after each modification which alters the design, material or manner of construction of a packaging.
- **6.3.5.1.5** Insert text of existing 6.3.2.7 with the following modifications:

Replace "of inner packagings or inner packagings of lower net mass" with "or lower net mass of primary receptacles"

Delete ", bags" after "such as drums"

6.3.5.1.6 Insert text of existing 6.3.2.9 with the following modifications: Replace "Inner" with "Primary" Replace "intermediate (secondary)" with "secondary" Replace "outer" with "rigid outer"
6.3.5.1.6.1 Replace "intermediate/outer packaging combination" with "rigid outer packaging" Replace "6.3.2.3" with "6.3.5.2.2"

Replace "inner" with "primary"

- **6.3.5.1.6.2** Replace "inner" with "primary" (twice)
- 6.3.5.1.6.3 Replace "inner" with "primary" (seven times)Replace "intermediate" with "secondary" (twice)Insert "spaces" after "to take up the void"
- **6.3.5.1.6.4** Replace "outer" with "rigid outer"

Replace "inner receptacles" with "packagings"

- 6.3.5.1.6.5 Replace "inner" with "primary" (twice)
- 6.3.5.1.6.6 Replace "outer" with "rigid outer"

Replace "inner" with "primary" (twice)

- **6.3.5.1.6.7** Replace "6.3.1.1" with "6.3.4.2" (twice)
- **6.3.5.1.7** The competent authority may at any time require proof, by tests in accordance with this section, that serially-produced packagings meet the provisions of the design type tests.
- **6.3.5.1.8** Provided the validity of the test results is not affected and with the approval of the competent authority, several tests may be made on one sample.
- **6.3.5.2** Preparation of packagings for testing
- **6.3.5.2.1** Insert text of existing 6.3.2.2 with the following modifications:

Replace "98% capacity" with "not less than 98% of its capacity"

Insert "**Note:** The term water includes water/antifreeze solution with a minimum specific gravity of 0.95 for testing at -18°C." after "98% of its capacity."

# 6.3.5.2.2 *Tests and number of samples required*

Type of packaging <sup>a</sup>			Tests requ	iired				
Rigid outer packaging	Primary receptacle PlasticsOther		Water spray 6.3.5.3.6.1	Cold conditioning 6.3.5.3.6.2	Drop 6.3.5.3	Additional drop 6.3.5.3.6.3	Puncture 6.3.5.4	Stack 6.1.5.6
			No. of samples	No. of samples	No. of samples	No. of samples	No. of samples	
Fibreboard	Х		5	5	10		2	
box		Х	5	0	5		2	
Fibreboard	Х		3	3	6		2	
drum		х	3	0	3		2	Required on
Plastics box	Х		0	5	5	Required on	2	three samples
1 lastics box		х	0	5	5	one sample	2	when testing a
Plastics	Х		0	3	3	when the	2	"U"-marked
drum/ jerrican		х	0	3	3	packaging is intended to	2	packaging as defined in
Boxes of	х		0	5	5	contain dry	2	6.3.5.1.6 for
other material		х	0	0	5	ice.	2	specific provisions.
Drums/ jerricans of	x		0	3	3		2	
other material		x	0	0	3		2	

#### Tests required for packaging types

<sup>a</sup> "Type of packaging" categorizes packagings for test purposes according to the kind of packaging and its material characteristics.

**Note 1:** In instances where a primary receptacle is made of two or more materials, the material most liable to damage determines the appropriate test.

**Note 2:** The material of the secondary packagings are not taken into consideration when selecting the test or conditioning for the test.

Explanation for use of the table:

If the packaging to be tested consists of a fibreboard outer box with a plastics primary receptacle, five samples must undergo the water spray test (see 6.3.5.3.6.1) prior to dropping and another five must be conditioned to  $-18^{\circ}$ C (see 6.3.5.3.6.2) prior to dropping. If the packaging is to contain dry ice then one further single sample shall be dropped five times after conditioning in accordance with 6.3.5.3.6.3.

Packagings prepared as for transport shall be subjected to the tests in 6.3.5.3 and 6.3.5.4. For outer packagings, the headings in the table relate to fibreboard or similar materials whose performance may be rapidly affected by moisture; plastics which may embrittle at low temperature; and other materials such as metal whose performance is not affected by moisture or temperature.

### 6.3.5.3 Drop test

- **6.3.5.3.1** Samples shall be subjected to free-fall drops from a height of 9 m onto a non-resilient, horizontal, flat, massive and rigid surface in conformity with 6.1.5.3.4.
- **6.3.5.3.2** Where the samples are in the shape of a box; five shall be dropped one in each of the following orientations:
  - .1 flat on the base;
  - .2 flat on the top;
  - .3 flat on the longest side;
  - .4 flat on the shortest side; and
  - .5 on a corner.
- **6.3.5.3.3** Where the samples are in the shape of a drum, three shall be dropped one in each of the following orientations:
  - .1 diagonally on the top chime, with the centre of gravity directly above the point of impact;
  - .2 diagonally on the base chime; and
  - .3 flat on the side.
- **6.3.5.3.4** While the sample shall be released in the required orientation, it is accepted that for aerodynamic reasons the impact may not take place in that orientation.
- **6.3.5.3.5** Following the appropriate drop sequence, there shall be no leakage from the primary receptacle(s) which shall remain protected by cushioning/absorbent material in the secondary packaging.

#### 6.3.5.3.6 Special preparation of test sample for the drop test

#### 6.3.5.3.6.1 Fibreboard – Water spray test

Fibreboard outer packagings: The sample shall be subjected to a water spray that simulates exposure to rainfall of approximately 5 cm per hour for at least one hour. It shall then be subjected to the test described in 6.3.5.3.1.

# 6.3.5.3.6.2 Plastics material – Cold conditioning

Plastics primary receptacles or outer packagings: The temperature of the test sample and its contents shall be reduced to -18°C or lower for a period of at least 24 hours and within 15 minutes of removal from that atmosphere the test sample shall be subjected to the test described in 6.3.5.3.1. Where the sample contains dry ice, the conditioning period shall be reduced to 4 hours.

# 6.3.5.3.6.3 Packagings intended to contain dry ice – Additional drop test

Where the packaging is intended to contain dry ice, a test additional to that specified in 6.3.5.3.1 and, when appropriate, in 6.3.5.3.6.1 or 6.3.5.3.6.2 shall be carried out. One sample shall be stored so that all the dry ice dissipates and then that sample shall be dropped in one of the orientations described in 6.3.5.3.2 which shall be that most likely to result in failure of the packaging.

# 6.3.5.4 Puncture test

# 6.3.5.4.1 Packagings with a gross mass of 7 kg or less

Insert text of existing 6.3.2.6.1 with the following modification:

Replace "not exceeding 38 mm" with "of 38 mm"

#### 6.3.5.4.2 Packagings with a gross mass exceeding 7 kg

Insert text of existing 6.3.2.6.2 with the following modifications:

Replace "the primary receptacle(s) and the outer surface" with "the centre of the primary receptacle(s) and the outer surface"

Insert "with its top face lowermost" before "in a vertical free fall"

Replace "the steel rod would penetrate" with "the steel rod would be capable of penetrating"

Replace "there shall be no leakage" with "penetration of the secondary packaging is acceptable provided that there is no leakage"

- **6.3.5.5** Insert heading of existing 6.3.3
- **6.3.5.5.1** Insert text of existing 6.3.3.1 with the following modifications:

Insert "written" before "test report"

**6.3.5.5.1.4** Replace "the test report" with "the test and of the report"

- **6.3.5.5.1.8** Replace "Characteristics of test contents, e.g., viscosity and relative density for liquids and particle size for solids;" with "Test contents;"
- **6.3.5.5.2** Insert text of existing 6.3.3.2"

#### **Consequential amendments:**

#### **Contents page:**

Chapter 6.3 Replace "substances" with "infectious substances of category A"

- 6.3.2 Replace "Test p" with "P"
- 6.3.3 Replace "Test report" with "Code for designating types of packagings"
- 6.3.4 Insert "6.3.4 Marking"
- 6.3.5 Insert "6.3.5 Test provisions for packagings"

#### Chapter 6.4

- **6.4.5.4.1.2** Replace "conform to the standards prescribed in chapter 6.1, or other provisions at least equivalent to those standards" with "satisfy the provisions for packing group I or II in chapter 6.1 of this Code"
- **6.4.5.4.2.2** Replace "conform to the standards prescribed in chapter 6.7, or other provisions at least equivalent to those standards" with "satisfy the provisions of chapter 6.7 of this Code"
- 6.4.5.4.3 Replace "that they conform to standards at least equivalent to those prescribed in 6.4.5.4.2." with "that:
  - .1 They satisfy the provisions of 6.4.5.1;
  - .2 They are designed to satisfy the provisions prescribed in regional or national regulations for the transport of dangerous goods and are capable of withstanding a test pressure of 265 kPa; and
  - .3 They are designed so that any additional shielding which is provided shall be capable of withstanding the static and dynamic stresses resulting from handling and routine conditions of transport and of preventing an increase of more than 20% in the maximum radiation level at any external surface of the tanks."
- 6.4.5.4.4 Insert "of a permanent enclosed character" after "Freight containers"

- **6.4.5.4.5.2** Replace "conform to the standards and test prescribed in chapter 6.5, for packing group I or II, and if they were subjected to the tests prescribed" with "satisfy the provisions of chapter 6.5 of this Code for packing group I or II, and if they were subjected to the tests prescribed in that chapter"
- **6.4.8.8** Justify the text to the left after .2(i) and .2(ii)
- 6.4.11.2 Replace "of this paragraph" with "of 2.7.2.3.5"
- 6.4.11.2.1 to 6.4.11.2.4 Delete text and table
- **6.4.11.11** Replace *""N"* is subcritical" with *""N"* packages shall be subcritical"
- 6.4.11.12 Replace *""N"* is subcritical" with *""N"* packages shall be subcritical"
- **6.4.11.13** Insert "**6.4.11.13** The criticality safety index (CSI) for packages containing fissile material shall be obtained by dividing the number 50 by the smaller of the two values of N derived in 6.4.11.11 and 6.4.11.12 (i.e. CSI = 50/N). The value of the criticality safety index may be zero, provided that an unlimited number of packages is subcritical (i.e. N is effectively equal to infinity in both cases)."
- **6.4.23.14(o)** Insert "6.4.8.4," before "6.4.8.5"

#### Chapter 6.5

**6.5.1.2** In the definition of *Plastics*:

Insert "material" after "Plastics"

Delete ", etc"

- **6.5.1.4.1(a)** Renumber 6.5.1.4.1(a) 6.5.1.4.1.1
- **6.5.1.4.1(b)** Renumber 6.5.1.4.1(b) as 6.5.1.4.1.2
- **6.5.2.1.1.1** Insert "This symbol shall not be used for any purpose other than certifying that a packaging complies with the relevant requirements in chapter 6.1, 6.2, 6.3, 6.5 or 6.6." before "For metal IBCs"
- **6.5.2.1.2** In the fourth, fifth, sixth and seventh examples, insert a full stop after the word "packaging" (English only)

In the fifth example, insert a full stop after the word "solids" (English only)

In the sixth example, insert a full stop after the word "stacked" (English only)

6.5.2.2.1 Replace "\*" with "a" (five times)

Insert new entry:

Additional marking	Category of IBC				
	Metal	Rigid Plastics	Composite	Fibreboard	Wooden
Maximum permitted stacking load <sup>b</sup>	Х	Х	Х	Х	Х

Insert "<sup>b</sup> See 6.5.2.2.2 This additional marking shall apply to all IBCs manufactured, repaired or remanufactured as from 1 January 2011..." after "<sup>a</sup> The unit used shall be indicated."

**6.5.2.2.2** Replace paragraph with "The maximum permitted stacking load applicable when the IBC is in use shall be displayed on a symbol as follows:





IBCs capable of being stacked

IBCs NOT capable of being stacked

The symbol shall be not less than  $100 \text{ mm} \times 100 \text{ mm}$ , be durable and clearly visible. The letters and numbers indicating the mass shall be at least 12 mm high.

The mass marked above the symbol shall not exceed the load imposed during the design type test (see 6.5.6.6.4) divided by 1.8.

- **Note:** The provisions of 6.5.2.2.2 shall apply to all IBCs manufactured, repaired or remanufactured as from 1 January 2011."
- **6.5.2.2.3** Replace paragraph with "Each flexible IBC may also bear a pictogram or pictograms indicating the recommended lifting methods."
- **6.5.2.2.4** Insert the existing text of 6.5.2.2.3
- **6.5.2.2.5** Insert the existing text of 6.5.2.2.5
- 6.5.4.1 Insert "Note: ISO 16106:2006 "Packaging Transport packages for dangerous goods Dangerous goods packagings, intermediate bulk containers (IBCs) and large packagings Guidelines for the application of ISO 9001" provides acceptable guidance on procedures which may be followed."

# 6.5.4.4.2 Insert "at least equally effective as the test prescribed in 6.5.6.7.3" after "a suitable leakproofness test"

Replace "For this test the IBC need not have its closures fitted." with "For this test the IBC shall be fitted with the primary bottom closure."

- **6.5.4.5.4** Renumber as 6.5.4.4.4
- **6.5.5.4.1** In the last paragraph replace "6.5.1.4.1.2" with "6.5.1.4.1(b)"
- **6.5.6.1.1** Replace "Tests shall be successfully performed on each IBC design type before such an IBC is used." with "Each IBC design type shall successfully pass the tests prescribed in this chapter before being used."
- **6.5.6.3.5** Replace the seven first columns with the following new eight first columns (3 last columns unchanged):

Type of IBC	Vibration <sup>f</sup>	Bottom	Top	Stacking <sup>b</sup>	Leak-	Hydraulic	Drop
		IIIt	mt		proofness	pressure	
Metal:							
11A, 11B, 11N	-	lst <sup>a</sup>	2nd	3rd	-	-	4th <sup>e</sup>
21A, 21B, 21N	-	1st <sup>a</sup>	2nd	3rd	4th	5th	6th <sup>e</sup>
31A, 31B, 31N	1st	2nd <sup>a</sup>	3rd	4th	5th	6th	7th <sup>e</sup>
Flexible <sup>d</sup>	-	-	x <sup>c</sup>	Х	-	-	Х
Rigid plastics:							
11H1, 11H2	-	1st <sup>a</sup>	2nd	3rd	-	-	4th
21H1, 21H2	-	1st <sup>a</sup>	2nd	3rd	4th	5th	6th
31H1, 31H2	1st	2nd <sup>a</sup>	3rd	4th	5th	6th	7th
Composite:							
11HŽ1, 11HZ2	-	1st <sup>a</sup>	2nd	3rd	-	-	4th <sup>e</sup>
21HZ1, 21HZ2	-	1st <sup>a</sup>	2nd	3rd	4th	5th	6th <sup>e</sup>
31HZ1, 31HZ2	1st	2nd <sup>a</sup>	3rd	4th	5th	6th	7th <sup>e</sup>
Fibreboard	-	1st	-	2nd	-	-	3rd
Wooden	-	1st	_	2nd	_	_	3rd

Insert "<sup>f</sup> Another IBC of the same design may be used for the vibration test."

- **6.5.6.5.5.1** Replace "no permanent deformation which renders the IBC, including the base pallet, if any, unsafe for transport" with "the IBC remains safe for normal conditions of transport, there is no observable permanent deformation of the IBC, including the base pallet, if any,"
- 6.5.6.7.3 Delete "Other methods at least equally effective may be used."
- **6.5.6.9.3** Replace "rigid, non-resilient, smooth, flat and horizontal surface, in such a manner so as to ensure that the point of impact is on" with "non-resilient, horizontal, flat, massive and rigid surface in conformity with the requirements of 6.1.5.3.4, in such a manner as to ensure that the point of impact is"

**6.5.6.9.5.4** Insert new paragraph "All IBCs: no damage which renders the IBC unsafe to be transported for salvage or for disposal, and no loss of contents. In addition, the IBC shall be capable of being lifted by an appropriate means until clear of the floor for five minutes.

**Note**: The criterion in 6.5.6.9.5.4 applies to design types for IBCs manufactured as from 1 January 2011."

**6.5.6.13** Insert new section 6.5.6.13:

#### "6.5.6.13 Vibration test

#### 6.5.6.13.1 *Applicability*

For all IBCs used for liquids, as a design type test.

**Note:** This test applies to design types for IBCs manufactured as from 1 January 2011.

#### 6.5.6.13.2 Preparation of the IBC for test

A sample IBC shall be selected at random and shall be fitted and closed as for transport. The IBC shall be filled with water to not less than 98% of its maximum capacity.

#### 6.5.6.13.3 *Test method and duration*

- **6.5.6.13.3.1** The IBC shall be placed in the center of the test machine platform with a vertical sinusoidal, double amplitude (peak-to peak displacement) of  $25 \text{ mm} \pm 5\%$ . If necessary, restraining devices shall be attached to the platform to prevent the specimen from moving horizontally off the platform without restricting vertical movement.
- **6.5.6.13.3.2** The test shall be conducted for one hour at a frequency that causes part of the base of the IBC to be momentarily raised from the vibrating platform for part of each cycle to such a degree that a metal shim can be completely inserted intermittently at, at least, one point between the base of the IBC and the test platform. The frequency may need to be adjusted after the initial set point to prevent the packaging from going into resonance. Nevertheless, the test frequency shall continue to allow placement of the metal shim under the IBC as described in this paragraph. The continuing ability to insert the metal shim is essential to passing the test. The metal shim used for this test shall be at least 1.6 mm thick, 50 mm wide, and be of sufficient length to be inserted between the IBC and the test platform a minimum of 100 mm to perform the test.

#### 6.5.6.13.4 Criteria for passing the test

No leakage or rupture shall be observed. In addition, no breakage or failure of structural components, such as broken welds or failed fastenings, shall be observed."

#### **Consequential amendments:**

- **6.5.6.2.1** Replace "6.5.6.12" with "6.5.6.13"
- **6.5.6.2.3** Replace "6.5.6.13" with "6.5.6.14"
- **6.5.6.14** Renumber 6.5.6.13 to 6.5.6.14

#### Chapter 6.6

- **6.6.1.2** Insert "Note: ISO 16106:2006 "Packaging Transport packages for dangerous goods Dangerous goods packagings, intermediate bulk containers (IBCs) and large packagings Guidelines for the application of ISO 9001" provides acceptable guidance on procedures which may be followed." after "meets the provisions of this chapter."
- **6.6.3.1(a)** Insert "This symbol shall not be used for any purpose other than certifying that a packaging complies with the relevant requirements in chapter 6.1, 6.2, 6.3, 6.5 or 6.6." before "For metal large packagings"
- **6.6.3.2** Insert a full stop at the end of the sentence (English only)
- **6.6.5.1.2** Replace "Tests shall be successfully performed on each large packaging design type before such a packaging is used." with "Each large packaging design type shall successfully pass the tests prescribed in this chapter before being used."
- **6.6.5.3.4.3** Replace "rigid, non-resilient, smooth, flat and horizontal surface," with "non resilient, horizontal, flat, massive and rigid surface in conformity with the requirements of 6.1.5.3.4,"

#### Chapter 6.7

- **6.7.1.1** Delete "of classes 1, 2, 3, 4, 5, 6, 8 and 9"
- **6.7.2.12.2.1** Replace " $kW.m^{-2}.K^{-1}$ " with "kW/m.K"
- **6.7.3.2.12.2** Replace "W.m<sup>-2</sup>.K<sup>-1</sup>" with "W/mK"
- **6.7.3.8.1.1** Replace " $kW.m^{-2}.K^{-1}$ " with "kW/m.K"

Insert "C may also be taken from the following table" before the table

- 6.7.4.14.4 Insert "and tests" after "5-year periodic inspection"
- 6.7.4.14.5 Replace paragraph with "(Reserved)"
- **6.7.4.14.10** Replace ", 6.7.4.14.5 and 6.7.4.14.7" with "and 6.7.4.14.7"
- **6.7.5.3.2** Replace "isolated by a valve into assemblies of not more than 3000 litres" with "divided into groups of not more than 3000 litres each isolated by a valve"
- **6.7.5.4.1 Replace** "shall be isolated by a valve into assemblies of not more than 3000 litres. Each assembly shall be fitted" with "shall be divided into groups of not more than 3000 litres each isolated by a valve. Each group shall be fitted"

#### PART 7

#### Chapter 7.1

7.1.7.4.5.2.2 Insert a comma between the words "deck" and "deckhead" (English only)

Insert new paragraph:

#### **"7.1.7.4.10 Loading and unloading operations**

In the event that a package containing goods of class 1 is found to be suffering from breakage or leakage expert advice should be obtained for its safe handling and disposal (see 7.3.1.3). Loading and unloading procedures and equipment used should be of such a nature that sparks are not produced, in particular where the floors of the cargo compartment are not constructed of close-boarded wood. All cargo handlers should be briefed by the shipper or receiver of the possible risks and necessary precautions, prior to commencing the handling of explosives."

- **7.1.9.2** Replace "substances with a flashpoint of 23°C c.c. or less" with "substances with a flashpoint of less than 23°C c.c."
- **7.1.9.6** Replace "flammable liquids with a flashpoint of 23°C c.c. or less" with "flammable liquids with a flashpoint of less than 23°C c.c."

#### Chapter 7.2

**7.2.7.1.1** Replace "and sodium nitrate of class 5.1" with "(UN 1942), AMMONIUM NITRATE FERTILZERS (UN 2067), alkali metal nitrates (e.g., UN 1486) and alkaline earth metal nitrates (e.g., UN 1454)"

# Chapter 7.3

Insert new paragraph:

- "7.3.1.3 In the event that a package containing dangerous goods is found to be suffering from breakage or leakage while the ship is in port, the port authorities should be informed and appropriate procedures should be followed."
- 7.3.4.3 Replace "Safety Guide No. TS-G-1-2 (ST-3) (ISBN 92-0-111602-0)" with "Safety Standard Series No. TS-G-1.2 (ST-3), IAEA, Vienna (2002)."

# Chapter 7.4

- 7.4.2.5 Replace "3.5 of the IMO publication *Recommendations on the Safe Use of Pesticides in Ships*" in the footnote with "MSC/Circ.[...] Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units"
- 7.4.4.1.1 Replace "23°C c.c. or less" with "less than 23°C c.c."
- 7.4.4.1.2 Replace "below" with "less than"
- 7.4.4.1.3 Replace "below" with "less than"
- 7.4.5.8 Replace "23°C c.c. or less" with "less than 23°C c.c."
- 7.4.5.11 Replace "23°C c.c. or less" with "less than 23°C c.c."
- 7.4.5.13 Replace "23°C c.c. or less" with "less than 23°C c.c."

#### Chapter 7.7

- **7.7.3.1.3** Replace " $W/m^2 K$ " with " $W/(m^2 K)$ "
- 7.7.6 Replace "below" with "less than"
- 7.7.6.1 Replace "below" with "less than"
- 7.7.6.2 Replace "below" with "less than"

#### Chapter 7.9

- **7.9.1 Note 2** Replace "1.1.3.4" with "1.5.4"
- **7.9.3** Subject to review by the Secretariat on the basis of information received from member States and Organizations.

Update the following Contact information:

Amend the entry of Germany to read:

Federal Ministry of transport, Building and Urban Affairs Division A 33 – Transport of Dangerous Goods PO Box 20 01 00 D 53170 Bonn GERMANY Telephone: +49 228 3000 or 300-extension +49 228 300 2643 Telefax: +49 228 300 3428 E-mail: Ref-A33@bmvbs.bund.de

Insert:

#### GHANA

The Director General Ghana Maritime Authority P.M.B. 34, Ministries Post Office Accra GHANA Telephone: +233 21 662122 Telefax: +233 21 677702

Amend the entry of Iran (Islamic Republic of) to read:

Ports and Shipping Organization PSO Building, South Didar Ave, Shahid Haghani Highway, Vanak Square Tehran IRAN Telephone: +98 21 8493 2201 Telefax: +98 21 8493 2227

Amend the entry of Italy to read:

Italian Coast Guard Headquarters Ponte Dei Mille Genoa 16100 ITALY Telephone: +39 010 25 18 154 + 102 +39 010 25 18 154 + 111 Fax: +39 010 24 78 245 E-mail: 001@sicnavge.it 005@sicnavge.it Insert:

# MONTENEGRO

Ministry of Interior and Public Administration of the Republic of MontenegroDepartment for Contingency Plans and Civil SecurityREPUBLIC OF MONTENEGROTelephone:+382 81 241 590Fax:+382 81 246 779E-mail:mup.emergency@cg.yu

Amend the entry of New Zealand to read:

Maritime New Zealand Level 10 Optimation House 1 Grey Street PO Box 27006 Wellington NEW ZEALAND Telephone: +64 4 473 0111 Telefax: +64 4 494 1263 E-mail: enquiries@maritimenz.govt.nz Website: www.maritimenz.govt.nz

Amend the entry of Norway to read:

Norwegian Maritime Directorate Smedasundeh 50B P.O. Box 2222 N-5509 HAUGESUND NORWAY Telephone: +47 5274 5000 Fax: +47 5244 5001 E-mail: postmottak@sjofartsdir.no Amend the entry of Peru to read:

Dirección General de Capitanías y Guardacostas Autoridad Marítima del Peru Dirección de Medio Ambiente Jr. Independencia No 150 Callao PERU Telefax: +51 1 613 6857 E-mail: dicapi.medioambiente@dicapi.mil.peru

Autoridad Portuaria Nacional Unidad de Protección y Seguridad Contralmirante Raygada No. 111 Callao PERU Telephone: +51 1 453 5656 ext. 114 +51 1 453 8112 Fax: +51 1 453 5656

Amend the entry of Poland to read:

Ministry of Maritime Economy Department of Maritime Safety 00-928 Warsaw ul. Chalubinskiego 4/6 POLAND Telephone: +48 22 630 15 40 Telefax: +48 22 830 09 47

Amend the entry of the Republic of Korea to read:

Maritime Technology Team Maritime Safety Bureau Ministry of Maritime Affairs and Fisheries 140-2 Gye-Dong, Jongno-gu, Seoul, 110-793 REPUBIC OF KOREA Telephonhe: +82 2 3674 6323 Telefax: +82 2 3674 6327

Insert:

#### **UNITED ARAB EMIRATES**

National Authority of Communications Marine Affairs Department PO Box 900 Abu Dhabi UNITED ARAB EMIRATES Telephone: +9712 4182 124 Fax: +9712 4491 500 E-mail: marine@naoc.gov.ae

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Amend the entry of the United States to read:

US Department of Transportation Pipeline and Hazardous Materials Safety Administration Office of International Standards East building/PHH-70 1200 New Jersey Ave S.E. Washington DC 20590 USA Telephone: +1 202 366 0656 Telefax: +1 202 366 5713 E-mail: infocntr@dot.gov Website: hazmat.dot.gov

United States Coast Guard Hazardous Materials Standards Division (G-3PSO-3) 2100 Second Street SW Washington, D.C. 20593-0001 USA Telephone: +1 202 372 1420 +1 202 372 1426 Telefax: +1 202 372 1926

# **APPENDIX A**

Replace "division 6.1" with "class 6.1"

Replace "61°C" with "60°C" In the General entries for ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S.

- Class 1.3L Insert "4.3" in the column marked "Subsidiary risk" for UN 0249
- Class 3 Delete the comma after the words "N.O.S" UN 3343 (English and French only)
- Class 3 Delete the comma after the words "N.O.S." in the column marked "Proper shipping name" for UN 3357 (English and French only)
- Class 3 Replace "61°C" with "60°C" for UN 3256
- Class 4.1 Delete "5.1" in the column marked "Subsidiary Risk" for UN 3181 (English only)
- Class 4.1 Replace "6.1" with "5.1" in the column marked "Subsidiary Risk" for UN 3097 (English only)
- Class 4.1 Replace "8" with "6.1" in the column marked "Subsidiary Risk" for UN 3179 (English only)

- Class 4.1 Insert "8" in the column marked "Subsidiary Risk" for UN 3180 (English only)
- Class 6.1 Replace title with "NICOTINE COMPOUND, LIQUID, N.O.S. or NICOTINE PREPARATION, LIQUID, N.O.S." in the column marked "Proper shipping name" for UN 3144 (English only)
- Class 6.1 Delete "3" in the column marked "Subsidiary Risk" for UN 3466 (English only)
- Class 6.1 Delete "8" in the column marked "Subsidiary Risk" for UN 3275 (English only)
- **Class 6.1** Delete "8" in the column marked "Subsidiary Risk" for UN 3279 (English only)
- Class 6.1 Replace existing entry with "3+8" in the column marked "Subsidiary Risk" for UN 2742 (English only)
- Class 6.1 Replace existing entry with "3+8" in the column marked "Subsidiary Risk" for UN 3362 (English only)
- Class 6.1 Insert "8" in the column marked "Subsidiary Risk" for UN 3277 (English only)
- Class 6.1 Insert "8" in the column marked "Subsidiary Risk" for UN 3361 (English only)
- Class 6.2 Replace existing entry with "BIOLOGICAL SUBSTANCE, CATEGORY B" for UN 3373 (English and French only)

**Class 8** Insert new entry (English and French only)

Class or	Subsidiary	UN	Proper Shipping Name
division	risk	Number	
8	6.1	3471	HYDROGENDIFLUORIDES SOLUTION, N.O.S

#### INDEX

- **Note 1** Replace "Certain marine pollutants or severe marine pollutants are identified only in the Index." with "Certain marine pollutants are identified only in the Index."
- Replace "These marine pollutants or severe marine pollutants have not been assigned to an N.O.S. or generic entry. These marine pollutants or severe marine pollutants may possess properties of classes 1 to 8 and shall be classified accordingly." with "These marine pollutants have not been assigned to an N.O.S. or generic entry. These marine pollutants may possess properties of classes 1 to 8 and shall be classified accordingly."

Delete:

Substance, material or article	MP	Class	UN No.
Paraffins, see	-	3	1223
2,4-D, see PHENOXY PESTICIDE	Р	-	-
2,4-DB, see PHENOXY PESTICIDE	-	-	-

Replace:

<b>Substance, material or article</b> 2,4-D, <i>see</i> PHENOXY PESTICIDE 2,4-DB, <i>see</i> PHENOXY PESTICIDE	<b>МР</b> Р -	Class - -	UN No. - -
With:			
<b>Substance, material or article</b> 2,4-D, <i>see</i> PHENOXYACETIC ACID DERIVATIVE 2,4-DB, <i>see</i> PHENOXYACETIC ACID DERIVATIVE	MP - -	Class - -	UN No. -
Replace "-" with " <b>P</b> " for:			
<b>Substance, material or article</b> <i>N, N</i> -Bis(2-hydroxyethyl)oleamide (loa), <i>see</i> <b>Note 1</b>	MP -	Class -	UN No.
Replace " <b>PP</b> " with " <b>P</b> " for:			
Substance, material or article	MP	Class	UN No.
Aldrin, see ORGANOCHLORINE PESTICIDE	PP		
Azinphos-ethyl, see ORGANOPHOSPHORUS PESTICIDE	PP		
Azinphos-methyl, see ORGANOPHOSPHORUS	РР		
Binapacryl, see SUBSTITUTED NITROPHENOL	PP		
Brodifacoum, see COUMARIN DERIVATIVE	PP		
Bromophos-ethyl, see ORGANOPHOSPHORUS	рр		
PESTICIDE Camphechlor_see ORGANOCHLORINE			
PESTICIDE	PP	-	
Carbophenothion, see ORGANOPHOSPHORUS PESTICIDE	PP		
Chlordane, see ORGANOCHLORINE PESTICIDE	PP		
Chlorinated Paraffins (C10-C13), see	PP	9	3082
Chlorinated Paraffins (C14-C17) with more than 1%	РР	9	3082
Shorter chain length, see Chlorpyrinhos, see ORGANOPHOSPHORUS			
PESTICIDE	PP		
Chlorthiophos, see ORGANOPHOSPHORUS	DD		
PESTICIDE	PP		
COPPER CHLORIDE	PP	8	2802
COPPER CYANIDE	PP	6.1	1587
Copper Metal Powder, see Note 1	РР		
see Note 1	PP		
Coumaphos, see COUMARIN DERIVATIVE	<b>D</b> 5		
PESTICIDE	PP		

Substance, material or article	MP	Class	UN No.
Cresyl Diphenyl Phosphate, see	РР	9	3082
Cupric Chloride, see	PP	8	2802
Cupric Cyanide, see	PP	6.1	1587
Cupric Sulphate, see Note 1	PP		
Cuprous Chloride, see	РР	8	2802
1,5,9-CYCLODODECATRIENE	PP	6.1	2518
Cyhexatin, see ORGANOTIN PESTICIDE,	РР		
CYMENES	PP	3	2046
Cymol, see	PP	3	2046
Cypermethrin, see PYRETHROID PESTICIDE	PP		
DDT, see ORGANOCHLORINE PESTICIDE	PP		
Dialifos, see ORGANOPHOSPHORUS PESTICIDE	PP		
Dialifos, see ORGANOPHOSPHRUS PESTICIDE	PP		
Diazinon, see ORGANOPHOSPHORUS	DD		
PESTICIDE	PP		
Dichlofenthion, see ORGANOPHOSPHORUS	DD		
PESTICIDE and	PP		
Dichlorvos, see ORGANOPHOSPHORUS	DD		
PESTICIDE	PP		
Diclofop-methyl, see Note 1	РР		
Dieldrin, see ORGANOCHLORINE PESTICIDE	РР		
Dimethoate, see ORGANOPHOSPHORUS	DD		
PESTICIDE	PP		
N,N-Dimethyldodecylamine, see Note 1	PP		
DIPHENYLAMINE CHLOROARSINE	PP	6.1	1698
DIPHENYLCHLOROARSINE, LIQUID	PP	6.1	1699
DIPHENYLCHLOROARSINE, SOLID	PP	6.1	3450
Dodecyl Hydroxypropyl Sulphide, see Note 1	РР		
Dodecylphenol, see	PP	8	3145
Endosulfan, see ORGANOCHLORINE PESTICIDE	PP		
Endrin, see ORGANOCHLORINE PESTICIDE	PP		
EPN, see ORGANOPHOSPHORUS PESTICIDE	PP		
Esfenvalerate, see Note 1	PP		
Ethion, see ORGANOPHOSPHORUS PESTICIDE	PP		
Fenbutatin Oxide, see Note 1	PP		
Fenitrothion, see ORGANOPHOSPHORUS	DD		
PESTICIDE	PP		
Fenoxapro-ethyl, see Note 1	PP		
Fenoxaprop-P-ethyl, see Note 1	PP		
Fenpropathrin, see PESTICIDE, N.O.S.	PP		
Fenthion, see ORGANOPHOSPHORUS	חח		
PESTICIDE	rr		
Fentin Acetate, see ORGANOTIN PESTICIDE	PP		
Fentin Hydroxide, see ORGANOTIN PESTICIDE	PP		

Substance, material or article	MP	Class	UN No.
Fonofos, see ORGANOPHSPHORUS PESTICIDE	РР		
Furathiocarb (iso), see CARBAMATE PESTICIDES	PP		
Heptachlor, see ORGANOCHLORINE PESTICIDE	РР		
Hexachloro-1,3-butadiene, see	РР	6.1	2279
HEXACHLOROBUTADIENE	РР	6.1	2279
1,3-Hexachlorobutadiene, see	PP	6.1	2279
Isopropyltoluene, see	PP	3	2046
Isopropyltoluol, see	PP	3	2046
Isoxathion, see ORGANOPHOSPHORUS	DD		
PESTICIDE	PP		
Lindane, see ORGANOCHLORINE PESTICIDE	PP		
Mercuric Acetate, see	PP	6.1	1629
Mercuric Ammonium Chloride, see	PP	6.1	1630
MERCURIC ARSENATE	PP	6.1	1623
Mercuric Benzoate, see	PP	6.1	1631
Mercuric Bisulphate, see	PP	6.1	1645
Mercuric Bromide, see	PP	6.1	1634
MERCURIC CHLORIDE	PP	6.1	1624
Mercuric Cyanide, see	PP	6.1	1636
Mercuric Gluconate, see	PP	6.1	1637
MERCURIC NITRATE	PP	6.1	1625
Mercuric Oleate, see	PP	6.1	1640
Mercuric Oxide, see	PP	6.1	1641
Mercuric Oxycyanide, Desensitized, see	PP	6.1	1642
MERCURIC POTASSIUM CYANIDE	PP	6.1	1626
Mercuric Sulphate, see	PP	6.1	1645
Mercuric Thiocyanate, see	PP	6.1	1646
Mercurol, see	PP	6.1	1639
Mercurous Acetate, see	PP	6.1	1629
Mercurous Bisulphate, see	PP	6.1	1645
Mercurous Bromide, see	PP	6.1	1634
Mercurous Chloride, see	PP	9	3077
MERCUROUS NITRATE	PP	6.1	1627
Mercurous Salicylate, see	PP	6.1	1644
Mercurous Sulphate, see	PP	6.1	1645
MERCURY ACETATE	PP	6.1	1629
MERCURY AMMONIUM CHLORIDE	PP	6.1	1630
MERCURY BASED PESTICIDE, LIQUID,	РР	3	2778
FLAMMABLE, TOXIC flashpoint less than 23°C			
MERCURY BASED PESTICIDE, LIQUID, TOXIC	PP	6.1	3012
MERCURY BASED PESTICIDE, LIQUID,			
IOXIC, FLAMMABLE flashpoint not less than	PP	6.1	3011
23°C	DP		0.555
MERCURY BASED PESTICIDE, SOLID, TOXIC	rr DD	6.1	2777
MERCURY BENZOATE	PP	6.1	1631

Substance, material or article	MP	Class	UN No.
Mercury Bichloride, see	РР	6.1	1624
Mercury Bisulphate, see	PP	6.1	1645
MERCURY BROMIDES	PP	6.1	1634
MERCURY COMPOUND, LIQUID, N.O.S.	PP	6.1	2024
MERCURY COMPOUND, SOLID, N.O.S.	PP	6.1	2025
MERCURY CYANIDE	PP	6.1	1636
MERCURY GLUCONATE	PP	6.1	1637
MERCURY NUCLEATE	PP	6.1	1639
MERCURY OLEATE	PP	6.1	1640
MERCURY OXIDE	PP	6.1	1641
MERCURY OXYCYANIDE, DESENSITIZED	PP	6.1	1642
Mercury Potassium Cyanide, see	PP	6.1	1626
MERCURY POTASSIUM IODIDE	PP	6.1	1643
MERCURY SALICYLATE	PP	6.1	1644
MERCURY SULPHATE	PP	6.1	1645
MERCURY THIOCYANATE	PP	6.1	1646
Mercury(II) (mercuric) Compounds or Mercury(I)			
(mercurous) Compounds, see MERCURY BASED PESTICIDE	PP		
Methylpronylbenzenes see	рр	3	2046
Mevinnhos see ORGANOPHOSPHORUS		5	2010
PESTICIDE	PP		
Nickel (II) Cvanide see	РР	61	1653
NICKEL CARBONYL	PP	6.1	1259
NICKEL CYANIDE	PP	6.1	1653
Nickel Tetracarbonyl, see	PP	6.1	1259
ORGANOTIN COMPOUND, LIQUID, N.O.S.	PP	6.1	2788
ORGANOTIN COMPOUND, SOLID, N.O.S.	PP	6.1	3146
Organotin Compounds (pesticides), see	DD		
ORGANOTIN PESTICIDE	PP		
ORGANOTIN PESTICIDE, LIQUID,	DD	2	2707
FLAMMABLE, TOXIC flashpoint less than 23°C	PP	3	2/8/
ORGANOTIN PESTICIDE, LIQUID, TOXIC	PP	6.1	3020
ORGANOTIN PESTICIDE, LIQUID, TOXIC,	DD	6 1	2010
FLAMMABLE flashpoint not less than 23°C	rr	0.1	3019
ORGANOTIN PESTICIDE, SOLID, TOXIC	PP	6.1	2786
OSMIUM TETROXIDE	PP	6.1	2471
Parathion, see ORGANOPHOSPHORUS	DD		
PESTICIDE	rr		
Parathion-methyl, see ORGANOPHOSPHORUS	DD		
PESTICIDE	11		
PCBs, LIQUID, see	PP	9	2315
PCBs, SOLID, see	PP	9	3432
PENTACHLOROPHENOL	PP	6.1	3155

Substance, material or article	MP	Class	UN No.
Pentachlorophenol, see ORGANOCHLORINE	DD		
PESTICIDE	11		
Phenarsazine Chloride, see	PP	6.1	1698
Phenthoate, see ORGANOPHOSPHORUS	РР		
PESTICIDE			
PHENYLMERCURIC ACETATE	PP	6.1	1674
PHENYLMERCURIC COMPOUND, N.O.S.	PP	6.1	2026
PHENYLMERCURIC HYDROXIDE	PP	6.1	1894
PHENYLMERCURIC NITRATE	PP	6.1	1895
Phorate, see ORGANOPHOSPHORUS PESTICIDE	PP		
Phosalone, see ORGANOPHOSPHORUS	РР		
PESTICIDE			
Phosphamidon, see ORGANOPHOSPHORUS	РР		
PESTICIDE			1001
PHOSPHORUS, WHITE, DRY	PP	4.2	1381
PHOSPHORUS, WHITE, IN SOLUTION	PP	4.2	1381
PHOSPHORUS, WHITE, MOLTEN	PP	4.2	2447
PHOSPHORUS, WHITE, UNDER WATER	PP	4.2	1381
PHOSPHORUS, YELLOW, DRY	PP	4.2	1381
PHOSPHORUS, YELLOW, IN SOLUTION	PP	4.2	1381
PHOSPHORUS, YELLOW, UNDER WATER	PP	4.2	1381
Pirimiphos-ethyl, see ORGANOPHOSPHORUS	РР		
PESTICIDE	 DD	0	2215
POLYCHLORINATED BIPHENYLS, LIQUID	PP	9	2315
POLYCHLORINATED BIPHENYLS, SOLID	PP	9	3432
POLYHALOGENATED BIPHENYLS, LIQUID	PP	9	3151
POLYHALOGENATED TEPPUNANU S. LIOUD	PP	9	3152
POLYHALOGENATED TERPHENYLS, LIQUID	PP	9	3151
POLYHALOGENATED TERPHENYLS, SOLID	PP	9	3152
POTASSIUM CUPROCYANIDE	PP	6.1	16/9
Potassium Cyanocuprate(1), see	PP	6.1	16/9
Potassium Cyanomercurate, see	PP	6.1	1626
Potassium Mercuric Iodide, see	РР	6.1	1643
Pyrazophos, see ORGANOPHOSPHORUS PESTICIDE	РР		
Quizalofop, see Note 1	PP		
Quizalofop-p-ethyl, see Note 1	РР		
Silafluofen, see Note 1	PP		
Sodium Copper Cyanide Solution, see	PP	6.1	2317
Sodium Copper Cyanide, Solid, see	PP	6.1	2316
SODIUM CUPROCYANIDE SOLUTION	PP	6.1	2317
SODIUM CUPROCYANIDE, SOLID	PP	6.1	2316
Sodium Dicyanocuprate(I), Solid, see	PP	6.1	2316
SODIUM PENTACHLOROPHENATE	PP	6.1	2567

Substance, material or article	MP	Class	UN No.
Sulprophos, see ORGANOPHOSPHORUS PESTICIDE	РР		
Terbufos, see ORGANOPHOSPHORUS PESTICIDE	PP		
Tetrachlorvinphos, see Note 1	РР		
Tetraethyl lead, see	РР	6.1	1649
Triaryl Phosphates, N.O.S., see	PP	9	3082
Tributyltin Compounds, see ORGANOTIN PESTICIDE	PP		
1,2,3-Trichlorobenzenes, see Note 1	PP		
TRICRESYL PHOSPHATE with more than 3% ortho-isomer	PP	6.1	2574
Tricresyl Phosphate, not less than 1% but not more than 3% ortho- isomer, see	PP	9	3082
Triphenyl Phosphate, see	PP	9	3077
Triphenyl Phosphate/tert-butylatedTriphenyl			
Phosphates mixtures containing 10% to 48% of Triphenyl Phosphate, see Note 1	РР		
and Fentin Hydroxide), see ORGANOTIN	РР		
Tritolyl Phosphate see	рр	61	2574
White Phosphorus, Dry, see	PP	4.2	1381
White Phosphorus, Wet, see	РР	4.2	1381
Yellow Phosphorus, Dry, see	PP	4.2	1381
Yellow Phosphorus, Wet, see	PP	4.2	1381
Delete "●" for:			
Substance, material or article	MP	Class	UN No.
ADHESIVES containing flammable liquid	•	3	1133
AEROSOLS	•	2	1950
ALCOHOLATES SOLUTION, N.O.S. in alcohol	•	3	3274
ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	•	3	1986
ALCOHOLS, N.O.S.	•	3	1987
ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	٠	3	1988
ALDEHYDES, N.O.S.	•	3	1989
ALKALI METAL ALCOHOLATES,	•	4.2	3206
SELF-HEATING, CORROSIVE, N.O.S.	_	4.2	1 40 1
ALKALI METAL AMALCANA LIQUID, N.U.S.	•	4.3	1421
ALNALI METAL AMALCAM SOLD	•	4.5	1389
ALNALI METAL AMALGAM, SOLID	•	4.3	5401 1710
Aikanne Causile Liquid, N.U.S., See	•	0	1/19

Substance, material or article	MP	Class	UN No.
ALKALINE EARTH METAL ALCOHOLATES,	•	4.2	3205
N.O.S.	•	4.2	5205
ALKALINE EARTH METAL ALLOY, N.O.S.	٠	4.3	1393
ALKALINE EARTH METAL AMALGAM,	•	43	1392
LIQUID	-	1.5	10/2
ALKALINE EARTH METAL AMALGAM, SOLID	•	4.3	3402
ALKALOIDS SALTS, LIOUID, N.O.S.	•	6.1	3140
ALKALOIDS SALTS, SOLID, N.O.S.	•	6.1	1544
ALKALOIDS, LIQUID, N.O.S.	•	6.1	3140
ALKALOIDS, SOLID, N.O.S.	•	6.1	1544
ALKYLPHENOLS, LIQUID, N.O.S. (including C2		0	2145
-C12 homologues)	•	8	3145
ALKYLPHENOLS, SOLID, N.O.S.(including C2 -		0	2420
C12 homologues)	•	8	2430
Aluminium Powder, Pyrophoric, see	•	4.2	1383
AMINES, FLAMMABLE, CORROSIVE, N.O.S.	•	3	2733
AMINES, LIQUID, CORROSIVE, FLAMMABLE,		0	2724
N.O.S.	•	8	2734
AMINES, LIQUID, CORROSIVE, N.O.S.	•	8	2735
AMINES, SOLID, CORROSIVE, N.O.S.	•	8	3259
Ammonium Bisulphite Solution, see	•	8	2693
Animal Fabrics, Oily, see	•	4.2	1373
Animal Fibres, Oily, see	•	4.2	1373
Arsenates, Liquid, N.O.S., Inorganic, see	•	6.1	1556
Arsenates, Solid, N.O.S., Inorganic, see	•	6.1	1557
ARSENIC COMPOUND, LIQUID, N.O.S.			
inorganic, including: Arsenates, n.o.s., Arsenites,	•	6.1	1556
n.o.s., and Arsenic sulphides, n.o.s.			
ARSENIC COMPOUND, SOLID, N.O.S.			
inorganic, including: Arsenates, n.o.s.; Arsenites,	•	6.1	1557
n.o.s.; and Arsenic sulphides, n.o.s.			
Arsenic Sulphides, Liquid, N.O.S., Inorganic, see	•	6.1	1556
Arsenic Sulphides, Solid, N.O.S., Inorganic, see	•	6.1	1557
ARSENICAL PESTICIDE, LIQUID,	•	3	2760
FLAMMABLE, TOXIC flashpoint less than 23°C	-	5	2,00
ARSENICAL PESTICIDE, LIQUID, TOXIC	•	6.1	2994
ARSENICAL PESTICIDE, LIQUID, TOXIC,	•	6.1	2993
FLAMMABLE flashpoint not less than 23°C		<u> </u>	
ARSENICAL PESTICIDE, SOLID, TOXIC	•	6.1	2759
Arsenites, Liquid, N.O.S., Inorganic, see	•	6.1	1556
Arsenites, Solid, N.O.S., Inorganic, see	•	6.1	1557
ARTICLES, PRESSURIZED, HYDRAULIC	•	2.2	3164
(containing non-flammable gas)			

Substance, material or article	MP	Class	UN No.
ARTICLES, PRESSURIZED, PNEUMATIC	_	2.2	2164
(containing non-flammable gas)	•	2.2	3164
Asphalt, see	٠	3	1999
Barium Alloys, non-pyrophoric, see	٠	4.3	1393
BARIUM ALLOYS, PYROPHORIC	٠	4.2	1854
Barium Amalgams, see	٠	4.3	1392
BARIUM COMPOUND, N.O.S.	•	6.1	1564
Barium Powder, Pyrophoric, see	•	4.2	1383
Bifluorides, N.O.S., see	٠	8	1740
BIPYRIDILIUM PESTICIDE, LIQUID,	•	3	2782
FLAMMABLE, TOXIC flashpoint less than 23°C	•	5	2782
BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC	٠	6.1	3016
BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC,	•	61	3015
FLAMMABLE flashpoint not less than 23°C	•	0.1	5015
BIPYRIDILIUM PESTICIDE, SOLID, TOXIC	٠	6.1	2781
BISULPHATES, AQUEOUS SOLUTION	٠	8	2837
BISULPHITES, AQUEOUS SOLUTION, N.O.S.	٠	8	2693
Bitumen, see	٠	3	1999
Borate and Chlorate Mixture, see	٠	5.1	1458
BROMATES, INORGANIC, AQUEOUS	•	51	3213
SOLUTION, N.O.S.	•	0.1	5215
BROMATES, INORGANIC, N.O.S.	٠	5.1	1450
Butylphenols, Liquid, N.O.S., see	٠	8	3145
Butylphenols, Solid, N.O.S., see	٠	8	2430
BUTYLTOLUENES	٠	6.1	2667
CADMIUM COMPOUND	٠	6.1	2570
Caesium Alloy (liquid), see	٠	4.3	1421
Caesium Amalgams, see	٠	4.3	1389
Caesium Powder, Pyrophoric, see	٠	4.2	1383
Calcium Alloy, non-pyrophoric, see	٠	4.3	1421
Calcium Amalgams, see	٠	4.3	1389
CARBAMATE PESTICIDE, LIQUID,	•	3	2758
FLAMMABLE, TOXIC flashpoint less than 23°C	-	5	2750
CARBAMATE PESTICIDE, LIQUID, TOXIC	٠	6.1	2992
CARBAMATE PESTICIDE, LIQUID, TOXIC,	•	61	2991
FLAMMABLE, flashpoint not less than 23°C	-	0.1	
CARBAMATE PESTICIDE, SOLID, TOXIC	٠	6.1	2757
CAUSTIC ALKALI LIQUID, N.O.S.	٠	8	1719
Cellulose Nitrate with plasticizing substance, see	٠	4.1	2557
Cement, Liquid, see	•	3	1133
CHLORATE AND BORATE MIXTURE	٠	5.1	1458
CHLORATE AND MAGNESIUM CHLORIDE	•	5.1	3407
MIXTURE SOLUTION		•••	2.07
CHLORATE AND MAGNESIUM CHLORIDE	•	5.1	1459
MIXTURE, SOLID		••••	- 107

Substance, material or article	MP	Class	UN No.
CHLORATES, INORGANIC, AQUEOUS	_	5 1	2210
SOLUTION, N.O.S.	•	3.1	3210
CHLORATES, INORGANIC, N.O.S.	•	5.1	1461
CHLORITE SOLUTION	•	8	1908
CHLORITES, INORGANIC, N.O.S.	•	5.1	1462
Chlorocarbonates, Toxic, Corrosive, Flammable,		6.1	2742
N.O.S., see	•	0.1	2742
Chlorocarbonates, Toxic, Corrosive, N.O.S., see	•	6.1	3277
CHLOROFORMATES, TOXIC, CORROSIVE,		6.1	2742
FLAMMABLE, N.O.S.	•	0.1	2742
CHLOROFORMATES, TOXIC, CORROSIVE,	-	(1	2277
N.O.S.	•	6.1	3277
CHLOROPHENOLATES, LIQUID	•	8	2904
CHLOROPHENOLATES, SOLID	•	8	2905
CHLOROPICRIN MIXTURE, N.O.S.	•	6.1	1583
CHLOROSILANES, CORROSIVE,			••••
FLAMMABLE, N.O.S.	•	8	2986
CHLOROSILANES CORROSIVE NOS	•	8	2987
CHLOROSILANES, FLAMMABLE,			
CORROSIVE, N.O.S.	•	3	2985
CHLOROSILANES TOXIC CORROSIVE			
FLAMMABLE NOS	•	6.1	3362
CHLOROSILANES TOXIC CORROSIVE			
N.O.S.	•	6.1	3361
CHLOROSILANES, WATER-REACTIVE,			
FLAMMABLE CORROSIVE NOS	•	4.3	2988
CHLOROTOLUENES	•	3	2238
Coal Tar Naphtha see	•	3	1268
COATING SOLUTION (includes surface		5	1200
treatments or coatings used for industrial purposes	•	3	1139
such as vehicle under-coating, drum or barrel lining)			
Collodion Cotton with plasticizing substance, see	•	4.1	2557
COMPRESSED GAS, FLAMMABLE, N.O.S.	•	2.1	1954
COMPRESSED GAS, N.O.S.	•	2.2	1956
COMPRESSED GAS, OXIDIZING, N.O.S.	•	2.2	3156
COMPRESSED GAS, TOXIC, CORROSIVE,	•	2.2	2204
N.O.S.	•	2.5	5504
COMPRESSED GAS, TOXIC, FLAMMABLE,	•	2.2	2205
CORROSIVE, N.O.S.	•	2.3	5505
COMPRESSED GAS, TOXIC, FLAMMABLE,	•	2.2	1052
N.O.S.	•	2.3	1933
COMPRESSED GAS, TOXIC, N.O.S.	•	2.3	1955
COMPRESSED GAS, TOXIC, OXIDIZING,	-	2.2	2200
CORROSIVE, N.O.S.	•	2.3	3300
COMPRESSED GAS, TOXIC, OXIDIZING,		2.2	2202
N.O.S.	•	2.3	3303

Substance, material or article	MP	Class	UN No.
Copper Arsenate, see	•	6.1	1557
COPPER BASED PESTICIDE, LIQUID, TOXIC	•	6.1	3010
COPPER BASED PESTICIDE, LIQUID, TOXIC,		3	2776
FLAMMABLE flashpoint less than 23°C	•	5	2770
COPPER BASED PESTICIDE, LIQUID, TOXIC,	•	61	3009
FLAMMABLE flashpoint not less than 23°C	•	0.1	5007
COPPER BASED PESTICIDE, SOLID, TOXIC	•	6.1	2775
N O S	•	8	3265
CORROSIVE LIQUID, ACIDIC, INORGANIC,		0	2264
N.O.S.	•	8	3264
CORROSIVE LIQUID, BASIC, INORGANIC,	•	8	32.66
N.U.S.		0	2200
CORROSIVE LIQUID, BASIC, OKGANIC, N.O.S.	•	8	3267
CORROSIVE LIQUID, FLAMMABLE, N.U.S.	•	8	2920
CORROSIVE LIQUID, N.O.S.	•	0 0	1/00
CORROSIVE LIQUID, OXIDIZING, N.O.S.	•	0	3093
CORROSIVE LIQUID, SELF-HEATING, N.O.S.	•	0 8	2022
CORROSIVE LIQUID, TOAIC, N.O.S.	•	0	2922
NOS	•	8	3094
CORROSIVE SOLID ACIDIC INORGANIC			
N O S	•	8	3260
CORROSIVE SOLID ACIDIC ORGANIC NOS	•	8	3261
CORROSIVE SOLID, Meinice, Originale, Aloris, CORROSIVE SOLID BASIC INORGANIC	•	0	5201
N.O.S.	•	8	3262
CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.	•	8	3263
CORROSIVE SOLID, FLAMMABLE, N.O.S.	•	8	2921
CORROSIVE SOLID, N.O.S.	•	8	1759
CORROSIVE SOLID, OXIDIZING, N.O.S.	•	8	3084
CORROSIVE SOLID, SELF- HEATING, N.O.S.	•	8	3095
CORROSIVE SOLID, TOXIC, N.O.S.	•	8	2923
CORROSIVE SOLID, WATER-REACTIVE,	•	Q	2006
N.O.S.	•	0	3090
Cosmetics, see	•	3	1266
COUMARIN DERIVATIVE PESTICIDE,			
LIQUID, FLAMMABLE, TOXIC flashpoint less	٠	3	3024
than 23°C			
COUMARIN DERIVATIVE PESTICIDE,	•	61	3026
LIQUID, TOXIC	•	0.1	5020
COUMARIN DERIVATIVE PESTICIDE, SOLID,	•	61	3027
TOXIC	-	0.1	5021
COUMARIN DERIVATIVEPESTICIDE, LIQUID,		<i>c</i> -	
TOXIC, FLAMMABLE flashpoint not less	٠	6.1	3025
than 23°C			

Substance, material or article	MP	Class	UN No.
Crude naphtha, see	•	3	1268
Cut-backs, see	•	3	1999
Cyanides, Organic, flammable, toxic, N.O.S., see	•	3	3273
Cyanides, Organic, toxic, flammable, N.O.S., see	•	6.1	3275
Cyanides, Organic, toxic, N.O.S., see	•	6.1	3276
DISINFECTANT, LIQUID, CORROSIVE, N.O.S.	•	8	1903
DISINFECTANT, LIQUID, TOXIC, N.O.S.	•	6.1	3142
DISINFECTANT, SOLID, TOXIC, N.O.S.	•	6.1	1601
DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.	•	8	2801
DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.	•	6.1	1602
DYE INTERMEDIATE, SOLID, CORROSIVE,		0	21.47
N.O.S.	•	8	314/
DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.	•	6.1	3143
DYE, LIQUID, CORROSIVE, N.O.S.	•	8	2801
DYE, LIQUID, TOXIC, N.O.S.	•	6.1	1602
DYE, SOLID, CORROSIVE, N.O.S.	•	8	3147
DYE, SOLID, TOXIC, N.O.S.	•	6.1	3143
ELEVATED TEMPERATURE LIQUID,			
FLAMMABLE, N.O.S. with flashpoint above 60°C,	•	3	3256
at or above its flashpoint			
ELEVATED TEMPERATURE LIQUID, N.O.S. at			
or above 100°C and below its flashpoint (including	•	9	3257
molten metals, molten salts, etc.)			
ELEVATED TEMPERATURE SOLID, N.O.S. at		0	3258
or above 240°C	•	)	5250
ENVIRONMENTALLY HAZARDOUS	•	9	3082
SUBSTANCE, LIQUID, N.O.S.	•	)	5002
ENVIRONMENTALLY HAZARDOUS	•	9	3077
SUBSTANCE, SOLID, N.O.S.	•	,	5077
ETHERS, N.O.S.	•	3	3271
EXTRACTS, AROMATIC, LIQUID	•	3	1169
EXTRACTS, FLAVOURING, LIQUID	•	3	1197
FABRICS IMPREGNATED WITH WEAKLY	•	4.1	1353
NITRATED NITROCELLULOSE, N.O.S.			1000
FABRICS, ANIMAL with oil	•	4.2	1373
FABRICS, SYNTHETIC N.O.S. with oil	•	4.2	1373
FABRICS, VEGETABLE with oil	•	4.2	1373
FIBRES WITH WEAKLY NITRATED	•	4.1	1353
NITROCELLULOSE, N.O.S.		1.2	1070
FIBRES, SYNTHETIC N.O.S. with oil	•	4.2	1373
FIBRES, ANIMAL WITH OIL, N.U.S.	•	4.2	13/3
FIBRES, VEGETABLE with oil, N.U.S.	•	4.2	1373
FIRELIGHTERS, SOLID with flammable liquid	•	4.1	2623
FLAMMABLE LIQUID, CORROSIVE, N.O.S.	•	3	2924
Substance, material or article	MP	Class	UN No.
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FLAMMABLE LIQUID, N.O.S.	•	3	1993
FLAMMABLE LIQUID, TOXIC, CORROSIVE,	•	3	3286
N.O.S.	•	5	5200
FLAMMABLE LIQUID, TOXIC, N.O.S.	•	3	1992
FLAMMABLE SOLID, CORROSIVE,	•	4.1	3180
INORGANIC, N.O.S.			
FLAMMABLE SOLID, CORROSIVE, ORGANIC, N O S	٠	4.1	2925
FLAMMABLE SOLID, INORGANIC, N.O.S.	•	4.1	3178
FLAMMABLE SOLID, ORGANIC, MOLTEN,	•	4 1	2176
N.O.S.	•	4.1	31/0
FLAMMABLE SOLID, ORGANIC, N.O.S.	•	4.1	1325
FLAMMABLE SOLID, OXIDIZING, N.O.S.	•	4.1	3097
FLAMMABLE SOLID, TOXIC, INORGANIC,	•	4 1	3179
N.O.S.	•	1.1	5175
FLAMMABLE SOLID, TOXIC, ORGANIC,	•	4.1	2926
N.U.S.		6.1	2956
FLUORUSILICATES, N.U.S.	•	0.1	2856
LIOUID NOS	٠	-	-
GAS SAMPLE NON-PRESSURIZED			
FLAMMABLE, N.O.S. not refrigerated liquid	•	2.1	3167
GAS SAMPLE, NON-PRESSURIZED, TOXIC,		• •	21.00
FLAMMABLE, N.O.S. not refrigerated liquid	•	2.3	3168
GAS SAMPLE, NON-PRESSURIZED, TOXIC,	•	2.2	2160
N.O.S. not refrigerated liquid	•	2.5	5109
GAS, REFRIGERATED LIQUID, FLAMMABLE,	•	21	3312
N.O.S.	•	2.1	5512
GAS, REFRIGERATED LIQUID, N.O.S.	•	2.2	3158
GAS, REFRIGERATED LIQUID, OXIDIZING,	•	2.2	3311
N.U.S.	•	2	1202
Gasoline Casinghead see	•	3	1203
Hydrides Metal Water-reactive NOS see	•	43	1203
HYDROCARBON GAS MIXTURE	•	т.5	1407
COMPRESSED. N.O.S.	•	2.1	1964
HYDROCARBON GAS MIXTURE, LIQUEFIED,		0.1	10.65
N.O.S.	•	2.1	1965
HYDROCARBONS, LIQUID, N.O.S.	•	3	3295
Hydrogen Sulphates, Aqueous Solution, see	•	8	2837
HYDROGENDIFLUORIDES SOLUTION, N.O.S.	•	8	3471
HYDROGENDIFLUORIDES, SOLID, N.O.S.	•	8	1740
HYPOCHLORITES, INORGANIC, N.O.S.	٠	5.1	3212
INSECTICIDE GAS, FLAMMABLE, N.O.S.	•	2.1	3354
INSECTICIDE GAS, N.O.S.	•	2.2	1968

Substance, material or article	MP	Class	UN No.
INSECTICIDE GAS, TOXIC, FLAMMABLE, N O S	•	2.3	3355
INSECTICIDE GAS, TOXIC, N.O.S.	٠	2.3	1967
ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S.	•	3	2478
ISOCYANATE SOLUTION, TOXIC, FLAMMABLE, N.O.S.	•	6.1	3080
ISOCYANATE SOLUTION, TOXIC, N.O.S.	•	6.1	2206
ISOCYANATES, FLAMMABLE, TOXIC, N.O.S.	٠	3	2478
ISOCYANATES, TOXIC, FLAMMABLE, N.O.S	٠	6.1	3080
ISOCYANATES, TOXIC, N.O.S.	•	6.1	2206
KETONES, LIQUID, N.O.S.	•	3	1224
LIQUEFIED GAS, FLAMMABLE, N.O.S.	•	2.1	3161
LIQUEFIED GAS, N.O.S.	•	2.2	3163
LIQUEFIED GAS, OXIDIZING, N.O.S.	•	2.2	3157
LIQUEFIED GAS, TOXIC, FLAMMABLE,	•	2.3	3309
CORROSIVE, N.O.S.			
LIQUEFIED GAS, IUXIC, UXIDIZING,	•	2.3	3310
LIQUEEUED CAS, TOYIC, OVIDIZING, N.O.S.	-	2.2	2207
LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	•	2.3	3307
LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	•	2.5	3308
LIQUEFIED GAS, TOXIC, FLAMMABLE, N.U.S.	•	2.5	3100 2162
LIQUEFIED GAS, TOXIC, N.O.S.	•	2.3	3102 1075
LFO, See Magnesium Chlorida and Chlorata Mixtura, soa	•	2.1 5.1	1073
MEDICINE LIQUID ELAMMADIE TOXIC	•	5.1	1439
NOS	•	3	3248
MEDICINE LIQUID TOXIC NOS	•	61	1851
MEDICINE SOLID TOXIC NOS		6.1	32/10
MERCAPTAN MIXTURE LIQUID	•	0.1	5247
FLAMMABLE NOS	٠	3	3336
MERCAPTAN MIXTURE LIQUID			
FLAMMABLE TOXIC NOS	٠	3	1228
MERCAPTAN MIXTURE LIQUID TOXIC			
FLAMMABLE NOS	•	6.1	3071
MERCAPTANS LIQUID FLAMMABLE NOS	•	3	3336
MERCAPTANS LIQUID FLAMMABLE		5	2220
TOXIC NOS	•	3	1228
MERCAPTANS, LIOUID, TOXIC.			
FLAMMABLE, N.O.S.	•	6.1	3071
Metal Alkyl Halides, Water-reactive, N.O.S., see	•	4.2	3394
Metal Alkyl Hydrides, Water-reactive, N.O.S., see	•	4.2	3394
Metal Alkyls, Water-reactive, N.O.S., see	•	4.2	3394
Metal Aryl Halides, Water-reactive, N.O.S., see	•	4.2	3394
Metal Aryl Hydrides, Water-reactive, N.O.S., see	•	4.2	3394

Substance, material or article	MP	Class	UN No.
Metal Aryls, Water-reactive, N.O.S., see	•	4.2	3394
METAL CARBONYLS, LIOUID, N.O.S.	•	6.1	3281
METAL CARBONYLS, SOLID, N.O.S.	•	6.1	3466
METAL HYDRIDES, FLAMMABLE, N.O.S.	•	4.1	3182
METAL HYDRIDES. WATER-REACTIVE.			4 4 6 6
N.O.S.	•	4.3	1409
METAL POWDER, FLAMMABLE, N.O.S.	•	4.1	3089
METAL POWDER, SELF-HEATING, N.O.S.	•	4.2	3189
METAL SALTS OF ORGANIC COMPOUNDS,	•	4 1	2101
FLAMMABLE, N.O.S.	•	4.1	5181
METALLIC SUBSTANCE, WATER-REACTIVE,	•	1 2	2208
N.O.S.	•	4.3	5208
METALLIC SUBSTANCE, WATER-REACTIVE,	•	1 2	2200
SELF-HEATING, N.O.S.	•	4.5	5209
Methylchlorobenzenes, see	•	3	2238
MOTOR SPIRIT	•	3	1203
Naphtha, Petroleum, see	•	3	1268
Naphtha, see	•	3	1268
NITRATES, INORGANIC, AQUEOUS	•	51	2210
SOLUTION, N.O.S.	•	3.1	3218
NITRATES, INORGANIC, N.O.S.	•	5.1	1477
NITRILES, FLAMMABLE, TOXIC, N.O.S.	•	3	3273
NITRILES, TOXIC, FLAMMABLE, N.O.S.	•	6.1	3275
NITRILES, TOXIC, LIQUID, N.O.S.	•	6.1	3276
NITRILES, TOXIC, SOLID, N.O.S.	•	6.1	3439
NITRITES, INORGANIC, AQUEOUS	•	5 1	2210
SOLUTION, N.O.S.	•	5.1	3219
NITRITES, INORGANIC, N.O.S.	•	5.1	2627
NITROCELLULOSE with not more than 12.6%			
nitrogen, by dry mass MIXTURE WITH	•	4.1	2557
PLASTICIZER WITHOUT PIGMENT			
NITROCELLULOSE with not more than 12.6%			
nitrogen, by dry mass MIXTURE WITHOUT	•	4.1	2557
PLASTICIZER WITH PIGMENT			
NITROCELLULOSE with not more than 12.6%			
nitrogen, by dry mass MIXTURE WITHOUT	•	4.1	2557
PLASTICIZER WITHOUT PIGMENT			
NITROCELLULOSE with not more than 12.6%			
nitrogen, by dry mass, MIXTURE WITH	•	4.1	2557
PLASTICIZER WITH PIGMENT			
Nitrocotton with plasticizing substance, see	٠	4.1	2557
NITROGLYCERIN MIXTURE, DESENSITIZED,			
LIQUID, FLAMMABLE, N.O.S. with not more	٠	3	3343
than 30% nitroglycerin, by mass			

Substance, material or article	MP	Class	UN No.
NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, N.O.S with not more than 30%	•	3	3357
NITROGLYCERIN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 2% but not more than 10% nitroglycerin, by mass	•	4.1	3319
ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	•	6.1	3280
ORGANOARSENIC COMPOUND, SOLID, N.O.S.	•	6.1	3465
ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23°C	•	3	2762
ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	•	6.1	2996
TOXIC, FLAMMABLE flashpoint not less than 23°C	•	6.1	2995
ORGANOCHLORINE PESTICIDE, SOLID, TOXIC	•	6.1	2761
ORGANOMETALLIC COMPOUND, SOLID, TOXIC, N.O.S.	•	6.1	3467
URGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S. ORGANOMETALLIC SUBSTANCE LIQUID	•	6.1	3282
PYROPHORIC ORGANOMETALLIC SUBSTANCE, LIQUID,	•	4.2	3392
PYROPHORIC, WATER-REACTIVE ORGANOMETALLIC SUBSTANCE, LIQUID,	•	4.2	3394
WATER-REACTIVE ORGANOMETALLIC SUBSTANCE, LIQUID,	•	4.5	3398
WATER-REACTIVE, FLAMMABLE ORGANOMETALLIC SUBSTANCE, SOLID,	•	4.2	3391
ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC WATER-REACTIVE	•	4.2	3393
ORGANOMETALLIC SUBSTANCE, SOLID, SELF-HEATING	•	4.2	3400
ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE	•	4.3	3395
ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE	•	4.3	3396
ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING	•	4.3	3397
FLAMMABLE, N.O.S.	•	6.1	3279

Substance, material or article	MP	Class	UN No.
ORGANOPHOSPHORUS COMPOUND, TOXIC,	•	6.1	3278
LIQUID, N.O.S.			
ORGANOPHOSPHORUS COMPOUND, TOXIC,	•	61	3464
SOLID, N.O.S.			
ORGANOPHOSPHORUS PESTICIDE, LIQUID,	•	3	2784
FLAMMABLE, TOXIC flashpoint less than 23°C	-	5	2701
ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	•	6.1	3018
ORGANOPHOSPHORUS PESTICIDE LIQUID			
TOXIC FLAMMABLE flashpoint not less than	•	61	3017
23°C		011	0017
ORGANOPHOSPHORUS PESTICIDE SOLID			
TOXIC	•	6.1	2783
OXIDIZING LIQUID CORROSIVE NOS	•	51	3098
OXIDIZING LIQUID, CORRESPOND, N.O.S.	•	5.1	3139
OXIDIZING LIQUID, TOXIC NOS	•	5.1	3000
OXIDIZING SOLID CORROSIVE NOS	•	5.1	3085
OVIDIZING SOLID, CORROSIVE, N.O.S.	•	5.1	3137
OXIDIZING SOLID, TEAMMADLE, N.O.S.	•	5.1	1/70
OXIDIZING SOLID, N.O.S.	•	5.1	3100
OXIDIZING SOLID, SELF-INEATING, N.O.S.		5.1	3087
OXIDIZING SOLID, TOXIC, N.O.S.		5.1	3121
DAINT (including paint lacquer enamel stain	•	5.1	5121
shellac solutions varnish polish liquid filler and	•	3	1263
liquid lacquer base)	•	5	1205
PAINT (including paint lacquer enamel stain			
shellac varnish polish liquid filler and liquid		8	3066
Jacquer base)	•	0	5000
PAINT RELATED MATERIAL (including paint			
thinning or reducing compound)	٠	3	1263
PAINT RELATED MATERIAL (including paint			
thinning or reducing compound)	٠	8	3066
PAINT CORROSIVE FLAMMABLE (including			
naint lacquer enamel stain shellac varnish			
polish liquid filler and liquid lacquer base) or			
PAINT RELATED MATERIAL CORROSIVE	٠	8	3470
FI AMMABI E (including paint thinning or			
reducing compound)			
DAINT ELAMMARIE CORROSIVE (including			
naint lacquer enamel stain shellac varnish			
palich, liquid filler and liquid lacquer base) or			
DAINT DELATED MATEDIAL ELAMMADIE	•	3	3469
COPROSIVE (including point thinning or reducing			
concost v E (including paint uniting of reducing			
compound)			

Substance, material or article	MP	Class	UN No.
PENTAERYTHRITE TETRANITRATE MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by	•	4.1	3344
mass PERCHLORATES, INORGANIC, AQUEOUS	•	5 1	2211
SOLUTION, N.O.S.	•	5.1	5211
PERCHLORATES, INORGANIC, N.O.S.	•	5.1	1481
PERFUMERY PRODUCTS with flammable liquid	٠	3	1266
PERMANGANATES, INORGANIC, AQUEOUS	•	5.1	3214
SOLUTION, N.U.S. DEDMANGANATES INODCANIC NOS	•	5 1	1407
PERMANGANATES, INORGANIC, N.O.S. PEROVIDES, INORGANIC, N.O.S.	•	5.1	1482
PERSUIPHATES INORGANIC ADJEDUS	•	5.1	1405
SOLUTION NOS	٠	5.1	3216
PERSULPHATES, INORGANIC, N.O.S.	•	5.1	3215
PESTICIDE, LIQUID, FLAMMABLE, TOXIC,	-	2	2021
N.O.S. flashpoint less than 23°C	•	3	3021
PESTICIDE, LIQUID, TOXIC, FLAMMABLE,	•	6.1	2003
N.O.S. flashpoint not less than 23°C	•	0.1	2903
PESTICIDE, LIQUID, TOXIC, N.O.S.	٠	6.1	2902
PESTICIDE, SOLID, TOXIC, N.O.S.	•	6.1	2588
PETROL	•	3	1203
PETROLEUM DISTILLATES, N.O.S.	•	3	1268
Petroleum Etner, see	•	3 2 1	1268
Petroleum Nanhtha, see	•	2.1	1073
Petroleum Oil see	•	3	1268
PETROLEUM PRODUCTS NOS	•	3	1268
Petroleum Raffinate. see	•	3	1268
PHENOLATES, LIQUID	•	8	2904
PHENOLATES, SOLID	•	8	2905
PHENOXYACETIC ACID DERIVATIVE			
PESTICIDE, LIQUID, FLAMMABLE, TOXIC	٠	3	3346
flashpoint less than 23°C			
PHENOXYACETIC ACID DERIVATIVE	•	61	3348
PESTICIDE, LIQUID, TOXIC		011	2210
PHENOXYACETIC ACID DERIVATIVE	_	(1	2247
PESTICIDE, LIQUID, TOXIC, FLAMMABLE	•	6.1	3347
PHENOXYACETIC ACID DEBIVATIVE			
PESTICIDE SOLID TOXIC	٠	6.1	3345
PLASTICS NITROCELLULOSE-BASED SELF-			
HEATING, N.O.S.	•	4.2	2006
POLYAMINES, FLAMMABLE, CORROSIVE,	_	2	0700
N.O.S.	•	3	2/33

Substance, material or article	MP	Class	UN No.
POLYAMINES, LIQUID, CORROSIVE,		0	0704
FLAMMABLE, N.O.S.	•	8	2734
POLYAMINES, LIOUID, CORROSIVE, N.O.S.	•	8	2735
POLYAMINES, SOLID, CORROSIVE, N.O.S.	•	8	3259
POLYESTER RESIN KIT	•	3	3269
PYRETHROID PESTICIDE, LIOUID.		-	
FLAMMABLE TOXIC flashpoint less than 23°C	•	3	3350
PYRETHROID PESTICIDE LIQUID TOXIC	•	61	3352
PYRETHROID PESTICIDE, LIQUID, TOXIC.			
FLAMMABLE flashpoint not less than 23°C	•	6.1	3351
PYRETHROID PESTICIDE SOLID TOXIC	•	61	3349
PYROPHORIC ALLOY NOS	•	4 2	1383
PYROPHORIC LIQUID INORGANIC NOS	•	4 2	3194
PYROPHORIC LIQUID, ORGANIC NOS	•	4 2	2845
PYROPHORIC METAL NOS	•	4 2	1383
PYROPHORIC SOLID INORGANIC NOS	•	4 2	3200
PYROPHORIC SOLID, INCOMMUNE, INCOM	•	4 2	2846
REFRIGERANT GAS NOS	•	2.2	1078
RESIN SOLUTION flammable	•	3	1866
Road Asphalt see	•	3	1999
RUBBER SOLUTION	•	3	1287
SELENATES	•	61	2630
SELENITES	•	6.1	2630
SELENIUM COMPOUND LIQUID NOS	•	6.1	3440
SELENIUM COMPOUND SOLID NOS	•	6.1	3283
SELF-HEATING LIQUID CORROSIVE			
INORGANIC N O S	•	4.2	3188
SELF-HEATING LIQUID CORROSIVE			
ORGANIC N O S	•	4.2	3185
SELF-HEATING LIQUID INORGANIC NOS	•	42	3186
SELF-HEATING LIQUID ORGANIC NOS	•	4 2	3183
SELF-HEATING LIQUID TOXIC INORGANIC			5105
N.O.S.	•	4.2	3187
SELF-HEATING LIOUID. TOXIC. ORGANIC.		4.0	2104
N.O.S.	•	4.2	3184
SELF-HEATING SOLID, CORROSIVE,		4.0	2102
INORGANIC, N.O.S.	•	4.2	3192
SELF-HEATING SOLID, CORROSIVE,		1.0	2126
ORGANIC, N.O.S.	•	4.2	3126
SELF-HEATING SOLID, INORGANIC, N.O.S.	•	4.2	3190
SELF-HEATING SOLID, ORGANIC, N.O.S.	•	4.2	3088
SELF-HEATING SOLID, OXIDIZING, N.O.S.	•	4.2	3127
SELF-HEATING SOLID, TOXIC, INORGANIC.	_	4.0	2101
N.O.S.	•	4.2	3191

Substance, material or article	MP	Class	UN No.
SELF-HEATING SOLID, TOXIC, ORGANIC,	•	4.2	3128
N.O.S.			
Silicofluorides, N.O.S., see	•	6.1	2856
Sodium Dicyanocuprate(1) Solution, see	•	6.1	2317
SOLIDS CONTAINING CORROSIVE LIQUID,	•	8	3244
N.U.S.			
SOLIDS CONTAINING FLAMMABLE LIQUID,	•	4.1	3175
N.U.S.		6.1	2242
SOLIDS CONTAINING TOXIC LIQUID, N.O.S.	•	0.1	5245 1002
Solvents, Flammable, N.O.S., see	•	3 2	1993
Solvents, Toxic, Flammable, N.O.S., see	•	3 4 2	1992
Strontium Alloy, non-pyrophoric, see	•	4.3	1393
SUBSTITUTED NITRODUENOL DESTICIDE	•	4.2	1383
LIQUID ELAMMARIE TOXIC flashnoint loss	•	2	2780
than 22°C	•	5	2780
SUBSTITUTED NITROPHENOL DESTICIDE			
LIQUID TOXIC	•	6.1	3014
SUBSTITUTED NITROPHENOL PESTICIDE			
LIOUID TOXIC FLAMMABLE flashpoint not	•	61	3013
less than 23°C	•	0.1	5015
SUBSTITUTED NITROPHENOL PESTICIDE			
SOLID TOXIC	•	6.1	2779
Synthetic Fabrics, Oily, see	•	4.2	1373
Synthetic Fibres, Oily, see	•	4.2	1373
TARS, LIQUID including road asphalt and oils,		2	1000
bitumen and cut backs	•	3	1999
TEAR GAS SUBSTANCE, LIQUID, N.O.S.	•	6.1	1693
TEAR GAS SUBSTANCE, SOLID, N.O.S.	•	6.1	3448
TELLURIUM COMPOUND, N.O.S.	•	6.1	3284
TERPENE HYDROCARBONS, N.O.S.	•	3	2319
Terpenes, N.O.S., see	•	3	2319
THIOCARBAMATE PESTICIDE, LIQUID,	•	2	2772
FLAMMABLE, TOXIC flashpoint less than 23°C	•	5	2112
THIOCARBAMATE PESTICIDE, LIQUID,	•	6.1	2006
TOXIC	•	0.1	3000
THIOCARBAMATE PESTICIDE, LIQUID,			
TOXIC, FLAMMABLE flashpoint not less than	•	6.1	3005
23°C			
THIOCARBAMATE PESTICIDE, SOLID, TOXIC	٠	6.1	2771
TINCTURES, MEDICINAL	•	3	1293

Substance, material or article	MP	Class	UN No.
TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 L C = 0	•	6.1	3390
TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to $500 \text{ LC}_{50}$	•	6.1	3389
TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub>	•	6.1	3384
TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC so	•	6.1	3383
TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 1000 $ml/m^3$ and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub>	•	6.1	3382
TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 200 $ml/m^3$ and saturated vapour concentration greater	•	6.1	3381
TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC <sub>50</sub> TOXIC BY INHALATION LIQUID, OXIDIZING	•	6.1	3388
N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC <sub>50</sub>	•	6.1	3387
TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 m <i>l</i> /m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 L Cre	•	6.1	3386
TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m <sup>3</sup> and saturated vapour concentration greater than or equal	•	6.1	3385

Substance, material or article	MP	Class	UN No.
TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	٠	6.1	3289
TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.	•	6.1	2927
TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	•	6.1	2929
TOXIC LIQUID, INORGANIC, N.O.S.	•	6.1	3287
TOXIC LIQUID, ORGANIC, N.O.S.	•	6.1	2810
TOXIC LIQUID, OXIDIZING, N.O.S.	•	6.1	3122
TOXIC LIQUID, WATER-REACTIVE, N.O.S.	•	6.1	3123
TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.	•	6.1	3290
TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S.	•	6.1	2928
TOXIC SOLID, FLAMMABLE, ORGANIC,	-	(1	2020
N.O.S.	•	0.1	2930
TOXIC SOLID, INORGANIC, N.O.S.	•	6.1	3288
TOXIC SOLID, ORGANIC, N.O.S.	•	6.1	2811
TOXIC SOLID, OXIDIZING, N.O.S.	•	6.1	3086
TOXIC SOLID, SELF-HEATING, N.O.S.	•	6.1	3124
TOXIC SOLID, WATER-REACTIVE, N.O.S.	•	6.1	3125
TOXINS, EXTRACTED FROM LIVING	•	6.1	3172
SOURCES, LIQUID, N.O.S.	•	0.1	J1/2
TOXINS, EXTRACTED FROM LIVING	•	6.1	3462
SOURCES, SOLID, N.O.S.	•	0.1	5402
TRIAZINE PESTICIDE, LIQUID, FLAMMABLE,	•	3	2764
TOXIC flashpoint less than 23°C	-	5	2701
TRIAZINE PESTICIDE, LIQUID, TOXIC	•	6.1	2998
TRIAZINE PESTICIDE, LIQUID, TOXIC,	•	6.1	2997
FLAMMABLE, flashpoint not less than 23°C		6.1	07(0
TRIAZINE PESTICIDE, SOLID, TOXIC	•	6.1	2763
TUPPENTINE CUPCTUTUTE	•	4.2	3394
IURPENTINE SUBSTITUTE	•	5	1300
VANADIUM COMPOUND, N.O.S.	•	0.1	3285
Vegetable Fabrics, Olly, see	•	4.2	13/3
WATED DEACTIVE LIQUID CODDOSIVE	•	4.2	13/3
WATER-REACTIVE LIQUID, CORROSIVE,	•	4.3	3129
N.U.S. WATED DEACTIVE LIQUID NOS	•	13	21/18
WATER-REACTIVE LIQUID, N.O.S. WATER-REACTIVE LIQUID TOXIC NOS	•	4.3	3140
WATER-REACTIVE SOLID CORROSIVE	•	4.5	5150
NOS	•	4.3	3131
WATER-REACTIVE SOLID FLAMMARI F			
NOS	•	4.3	3132
WATER-REACTIVE SOLID, N.O.S	•	4.3	2813
WATER-REACTIVE SOLID, OXIDIZING, N.O.S.	•	4.3	3133
, , ,			

Substance, material or article	MP	Class	UN No.
WATER-REACTIVE SOLID, SELF-HEATING, N O S	•	4.3	3135
WATER-REACTIVE SOLID, TOXIC, N.O.S. WOOD PRESERVATIVES, LIQUID	•	4.3 3	3134 1306
Replace (French version) ACIDE FLUORHYDRIQUE, solution contenant au plus 60% de fluorure d'hydrogène with	-	8	1790
ACIDE FLUORHYDRIQUE, contenant au plus 60% de fluorure d'hydrogène	-	8	1790
Replace (French version) ACIDE FLUORHYDRIQUE, solution contenant plus de 60% de fluorure d'hydrogène with	-	8	1790
ACIDE FLUORHYDRIQUE, contenant plus de 60% de fluorure d'hydrogène	-	8	1790
Replace (French version) ALKYLALUMINIUMS with	-	4.2	3051
Alkylaluminiums, <i>voir</i>	-	4.2	3394
Replace 2-Butenoic Acid, <i>see</i>	-	8	2823
2-Butenoic Acid, Solid, <i>see</i> 2-Butenoic Acid, Liquid, <i>see</i>	-	8 8	2823 3472
Replace Barium Amalgams, <i>see</i>	-	4.3	1392
Barium Amalgams, Liquid, <i>see</i> Barium Amalgams, Solid, <i>see</i>	-	4.3 4.3	1392 3402
Insert new entry BATTERY-POWERED VEHICLE or BATTERY-POWERED EQUIPMENT	-	9	3171
Replace Caesium Amalgams, <i>see</i>	-	4.3	1389
Caesium Amalgams, Liquid, see Caesium Amalgams, Solid, see	-	4.3 4.3	1389 3401

Replace			
Calcium Amalgams. see	-	4.3	1389
with			
Calcium Amalgams, Liquid, see	-	4.3	1389
Calcium Amalgams, Solid, see	-	4.3	3402
Insert new entry			
CALCIUM OXIDE	-	8	1910
Deplace			
Cesium saa		13	1407
with	-	4.5	1407
Caesium see CAESIUM	_	_	_
Catsium, see CALSIOM	-	-	-
Replace			
CHARGES, BURSTING, PLASTICS-BONDED	-	1.4D	0459
with			
CHARGES, BURSTING, PLASTICS BONDED	-	1.4D	0459
Replace		1.40	0460
CHARGES, BURSTING, PLASTICS-BONDED	-	1.48	0460
WILL CHARCES DURSTING DI ASTICS DONDED		1 40	0460
CHARGES, BURSTING, PLASTICS BONDED	-	1.45	0400
Replace			
2.4-Di- <i>tert</i> -butylphenol. see	_	8	2430
with		-	
2,4-Di-tert-butylphenol, see Note 1	-	-	-
Replace			
2,6-Di- <i>tert</i> -butylphenol, see	-	8	2430
with			
2,6-D1- <i>tert</i> -butylphenol, see Note 1	-	-	-
Insert new entry			
ENGINE INTERNAL COMBUSTION or VEHICLE			
FLAMMABLE GAS POWERED or VEHICLE,	_	9	3166
FLAMMABLE LIQUID POWERED		,	5100
Insert new entry			
ETHANOL AND GASOLINE MIXTURE or			
ETHANOL AND MOTOR SPIRIT MIXTURE or	_	2	2175
ETHANOL AND PETROL MIXTURE, with more than	-	5	3473
10% ethanol			

Replace FUEL CELL CARTRIDGES containing flammable liquids with	-	3	3473
FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PLACED WITH EQUIPMENT	-	3	3473
Insert new entry FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing corrosive substances	-	8	3477
Insert new entry FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing hydrogen in metal hydride	-	2.1	3479
Insert new entry FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing liquefied flammable gas	-	2.1	3478
Insert new entry FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing water-reactive substances	-	4.3	3476
Replace HYDROFLUORIC ACID solution, with more than 60% hydrofluoric acid with	-	8	1790
HYDROFLUORIC ACID solution, with more than 60% hydrogen fluoride	-	8	1790
Replace HYDROFLUORIC ACID solution, with not more than 60% hydrofluoric acid with	-	8	1790
HYDROFLUORIC ACID solution, with not more than 60% hydrogen fluoride	_	8	1790

Replace HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM with HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM or HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM CONTAINED IN EQUIPMENT OR HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM PACKED WITH EQUIPMENT	-	2.1	3468
Insert new entry	-	2.1	5408
dry or wetted with less than 20% water, by mass	-	1.3C	0508
Insert new entry 1-HYDROXYBENZOTRIAZOLE, ANHYDROUS, WETTED with not less than 20% water, by mass	-	4.1	3474
Replace Lithium Amalgams, <i>see</i>	-	4.3	1389
with Lithium Amalgams, Liquid, see Lithium Amalgams, Solid, see		4.3 4.3	1389 3401
Replace LITHIUM BATTERIES with	-	9	3090
LITHIUM METAL BATTERIES (including lithium alloy batteries)	-	9	3090
Replace LITHIUM BATTERIES CONTAINED IN EQUIPMENT with	-	9	3091
LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT	-	9	3091
Replace LITHIUM BATTERIES PACKED WITH EQUIPMENT with	-	9	3091
LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT	-	9	3091
Insert new entry LITHIUM ION BATTERIES (including lithium ion polymer batteries)	-	9	3480

Insert new entry LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)	-	9	3481
Replace Magnesium Amalgams, <i>see</i> with	-	4.3	1392
Magnesium Amalgams, Liquid, <i>see</i> Magnesium Amalgams, Solid, <i>see</i>	-	4.3 4.3	1392 3402
Insert new entry MAGNETIZED MATERIAL	-	9	2807
Replace 3-Methacrylic Acid, <i>see</i>	-	8	2823
3-Methacrylic Acid, Solid, <i>see</i> 3-Methacrylic Acid, Liquid, <i>see</i>	-	8 8	2823 3472
Replace NITRIC ACID other than red fuming, with not more than 70% nitric acid with	-	8	2031
NITRIC ACID other than red fuming, with at least 65% but with not more than 70% nitric acid NITRIC ACID other than red fuming, with less than 65% nitric acid	-	8 8	2031 2031
Replace PENTAERYTHRITE TETRANITRATE MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass with PENTAERYTHRITE TETRANITRATE	-	4.1	3344
(PENTAERYTHRITOL TETRANITRATE; PETN) MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass	-	4.1	3344
Replace Potasium Amalgams, <i>see</i> with	-	4.3	1389
Potasium Amalgams, Liquid, see Potasium Amalgams, Solid, see	-	4.3 4.3	1389 3401

Replace			
Rubidium Amalgams, see	-	4.3	1389
Rubidium Amalgams Liquid saa		13	1380
Rubidium Amalgams, Elquid, see	-	4.3	3401
Rubidium Amarganis, Sond, see	-	4.3	3401
Insert new entry			
SIGNALS, DISTRESS, ship	-	1.4G	0506
Insert new entry			
SIGNALS, DISTRESS, ship	-	1.4S	0506
Insert new entry			
SIGNALS, SMOKE	-	1.4S	0507
Insert new entry		0	
SODIUM ALUMINATE, SOLID	-	8	2812
Replace			
Sodium Amalgams, see	-	4.3	1389
With			
Sodium Amalgams, Liquid, see	-	4.3	1389
Sodium Amalgams, Solid, see	-	4.3	3401
Replace			
Strontium Amalgams, see	-	4.3	1392
With			
Strontium Amalgams, Liquid, see	-	4.3	1392
Strontium Amalgams, Solid, see	-	4.3	3402
Replace			
TRINITROPHENOL, WETTED with not less than			
30% water, by mass	-	4.1	1344
with			
TRINITROPHENOL (PICRIC ACID), WETTED			
with not less than 30% water, by mass	-	4.1	1344
Replace			
TRINITROLUENE, WETTED with not less than 30%			
water, by mass	-	4.1	1356
with			
TRINITROLUENE (TNT), WETTED with not less			
than 30% water, by mass	-	4.1	1356

Insert Aluminium alkyls, <i>see</i> Aluminium alkyl halides, liquid, <i>see</i> Aluminium alkyl halides, solid, <i>see</i> Aluminium alkyl hydrides, <i>see</i>	4.2 4.2 4.2 4.2	3394 3394 3393 3394
Insert Diethylzinc, <i>see</i> Dimethylzinc, <i>see</i> Lithium alkyls, liquid, <i>see</i>	4.2 4.2 4.2	3394 3394 3394
Replace LITHIUM ALKYLS, SOLID -	4.2	3443
with Lithium alkyls, solid, <i>see</i> -	4.2	3393
Insert Magnesium alkyls, <i>see</i> Magnesium diphenyl, <i>see</i>	4.2 4.2	3394 3393
Insert Organometallic compound solid, water reactive,	1 2	2206
Organometallic compound dispersion, water reactive, flammable, <i>see</i>	4.3	3390
Organometallic compound solution, water reactive, flammable, <i>see</i>	4.3	3399
Replace ORGANOMETALLIC COMPOUND, SOLID, TOXIC, N.O.S	6.1	3467
with ORGANOMETALLIC COMPOUND, SOLID, TOXIC, N.O.S -	6.1	3467
Insert Pyrophoric organometallic compound, water reactive, liquid see	12	3394
Pyrophoric organometallic compound, water reactive,	4.2	3393



MARITIME SAFETY COMMITTEE 84th session Agenda item 24 MSC 84/24/Add.2 6 June 2008 Original: ENGLISH

# REPORT OF THE MARITIME SAFETY COMMITTEE ON ITS EIGHTY-FOURTH SESSION

Attached are annexes 9 to 11 and 13 to 23 to the report of the Maritime Safety Committee on its eighty-fourth session (MSC 84/24).

For reasons of economy, this document is printed in a limited number. Delegates are kindly asked to bring their copies to meetings and not to request additional copies.



#### LIST OF ANNEXES

- ANNEX 9 RESOLUTION MSC.263(84) REVISED PERFORMANCE STANDARDS AND FUNCTIONAL REQUIREMENTS FOR THE LONG-RANGE IDENTIFICATION AND TRACKING OF SHIPS
- ANNEX 10 RESOLUTION MSC.264(84) ESTABLISHMENT OF THE INTERNATIONAL LRIT DATA EXCHANGE ON AN INTERIM BASIS
- ANNEX 11 DRAFT AMENDMENTS TO THE 1974 SOLAS CONVENTION
- ANNEX 13 DRAFT AMENDMENTS TO THE INTERNATIONAL CODE FOR THE SAFE CARRIAGE OF PACKAGED IRRADIATED NUCLEAR FUEL, PLUTONIUM AND HIGH-LEVEL RADIOACTIVE WASTES ON BOARD SHIPS (INF CODE)
- ANNEX 14 RESOLUTION MSC.265(84) AMENDMENTS TO THE REVISED GUIDELINES FOR APPROVAL OF SPRINKLER SYSTEMS EQUIVALENT TO THAT REFERRED TO IN SOLAS REGULATION II-2/12 (RESOLUTION A.800(19))
- ANNEX 15 DRAFT AMENDMENTS TO SOLAS CHAPTER II-2
- ANNEX 16 DRAFT AMENDMENTS TO THE 2000 HSC CODE
- ANNEX 17 RESOLUTION MSC.266(84) CODE OF SAFETY FOR SPECIAL PURPOSE SHIPS, 2008
- ANNEX 18 DRAFT AMENDMENTS TO THE LSA CODE
- ANNEX 19 DRAFT MSC RESOLUTION ON ADOPTION OF AMENDMENTS TO THE REVISED RECOMMENDATION ON TESTING OF LIFE-SAVING APPLIANCES (RESOLUTION MSC.81(70))
- ANNEX 20 DRAFT AMENDMENTS TO THE INTERNATIONAL SAFETY MANAGEMENT (ISM) CODE
- ANNEX 21 WORK PROGRAMMES OF THE SUB-COMMITTEES
- ANNEX 22 PROVISIONAL AGENDAS FOR THE SUB-COMMITTEES
- ANNEX 23 STATEMENT BY THE DELEGATION OF PANAMA

(See document MSC 84/24/Add.1 for annexes 1 to 8 and document MSC 84/24/Add.3 for annex 12)

#### ANNEX 9

#### RESOLUTION MSC.263(84) (adopted on 16 May 2008)

### **REVISED PERFORMANCE STANDARDS AND FUNCTIONAL REQUIREMENTS FOR THE LONG-RANGE IDENTIFICATION AND TRACKING OF SHIPS**

#### 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) on Procedure for the adoption of, and amendments to, performance standards and technical specifications, 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,

RECALLING FURTHER the provisions of the new regulation V/19-1 of the International Convention for the Safety of Life at Sea, 1974, as amended (the Convention), relating to the long-range identification and tracking of ships,

ALSO RECALLING the Performance standards and functional requirements for the long-range identification and tracking of ships (the Performance standards) adopted by resolution MSC.210(81) and amended by resolution MSC.254(83),

RECOGNIZING the need to adopt certain amendments to the Performance standards,

HAVING CONSIDERED the recommendation made, at its eighty-fourth session,

1. ADOPTS the Revised performance standards and functional requirements for the long-range identification and tracking of ships, set out in the Annex to the present resolution;

2. **RECOMMENDS** Contracting Governments to the Convention to ensure that:

- .1 shipborne systems and equipment used to meet the requirements of regulation V/19-1 of the Convention conform to performance standards not inferior to those specified in the Annex to the present resolution;
- .2 all Long-range identification and tracking (LRIT) Data Centres and the International LRIT Data Exchange conform to functional requirements not inferior to those specified in the Annex to the present resolution; and
- .3 they promptly submit to the Organization and to the LRIT Data Centres the required information to enable the establishment and the continuous functioning of the LRIT system and that they update such information as and when changes occur;

3. AGREES to review and amend, in the light of experience gained as necessary, the Revised performance standards and functional requirements for the long-range identification and tracking of ships, set out in the Annex to the present resolution;

4. REVOKES resolutions MSC.210(81) and MSC.254(83).

#### ANNEX

### **REVISED PERFORMANCE STANDARDS AND FUNCTIONAL REQUIREMENTS FOR THE LONG-RANGE IDENTIFICATION AND TRACKING OF SHIPS**

#### 1 Overview

1.1 The Long-Range Identification and Tracking (LRIT) system provides for the global identification and tracking of ships.

1.2 The LRIT system consists of the shipborne LRIT information transmitting equipment, the Communication Service Provider(s), the Application Service Provider(s), the LRIT Data Centre(s), including any related Vessel Monitoring System(s), the LRIT Data Distribution Plan and the International LRIT Data Exchange. Certain aspects of the performance of the LRIT system are reviewed or audited by an LRIT Coordinator acting on behalf of all Contracting Governments. Figure 1 provides an illustration of the LRIT system architecture.

#### Figure 1



#### LRIT system architecture

1.3 LRIT information is provided to Contracting Governments and Search and rescue services<sup>1</sup> entitled to receive the information, upon request, through a system of National, Regional, Cooperative and International LRIT Data Centres, using where necessary, the International LRIT Data Exchange.

1.4 Each Administration should provide to the LRIT Data Centre it has selected, a list of the ships entitled to fly its flag, which are required to transmit LRIT information, together with other salient details and should update, without undue delay, such lists as and when changes occur. Ships should only transmit the LRIT information to the LRIT Data Centre selected by their Administration.

1.5 The obligations of ships to transmit LRIT information and the rights and obligations of Contracting Governments and of Search and rescue services to receive LRIT information are established in regulation V/19-1 of the 1974 SOLAS Convention.

# 2 Definitions

- 2.1 Unless expressly provided otherwise:
  - .1 *Convention* means the International Convention for the Safety of Life at Sea, 1974, as amended.
  - .2 *Regulation* means a regulation of the Convention.
  - .3 *Chapter* means a chapter of the Convention.
  - .4 *LRIT Data User* means a Contracting Government or a Search and rescue (SAR) service which opts to receive the LRIT information it is entitled to.
  - .5 *Committee* means the Maritime Safety Committee.
  - .6 *High-speed craft* means a craft as defined in regulation X/1.3.
  - .7 *Mobile offshore drilling unit* means a mobile offshore drilling unit as defined in regulation XI-2/1.1.5.
  - .8 *Organization* means the International Maritime Organization.
  - .9 Vessel Monitoring System means a system established by a Contracting Government or a group of Contracting Governments to monitor the movements of the ships entitled to fly its or their flag. A Vessel Monitoring System may also collect from the ships information specified by the Contracting Government(s) which has established it.
  - .10 *LRIT information* means the information specified in regulation V/19-1.5.

<sup>&</sup>lt;sup>1</sup> The term *search and rescue service* is defined in regulation V/2.5

2.2 The term "ship", when used in the present performance standards, includes mobile offshore drilling units and high-speed craft as specified in regulation V/19-1.4.1 and means a ship which is required to transmit LRIT information.

2.3 Terms not otherwise defined should have the same meaning as the meaning attributed to them in the Convention.

# **3** General provisions

3.1 It should be noted that regulation V/19-1.1 provides that:

Nothing in this regulation or the provisions performance standards and functional requirements adopted by the Organization in relation to the long-range identification and tracking of ships shall prejudice the rights, jurisdiction or obligations of States under international law, in particular, the legal regimes of the high seas, the exclusive economic zone, the contiguous zone, the territorial seas or the straits used for international navigation and archipelagic sea lanes.

3.2 In operating the LRIT system, recognition should be given to international conventions, agreements, rules or standards that provide for the protection of navigational information.

3.3 The present performance standards should always be read together with regulation V/19-1 and the technical specifications for the LRIT system<sup>2</sup>.

### 4 Shipborne equipment

4.1 In addition to the general requirements contained in resolution A.694(17) on Recommendations on general requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids, the shipborne equipment should comply with the following minimum requirements:

- .1 be capable of automatically and without human intervention on board the ship transmitting the ship's LRIT information at 6-hour intervals to an LRIT Data Centre;
- .2 be capable of being configured remotely to transmit LRIT information at variable intervals;
- .3 be capable of transmitting LRIT information following receipt of polling commands; and
- .4 interface directly to the shipborne global navigation satellite system equipment, or have internal positioning capability;

<sup>&</sup>lt;sup>2</sup> Refer to MSC.1/Circ.1259 on Interim revised technical specifications for the LRIT system.

- .5 be supplied with energy from the main and emergency source of electrical power<sup>3</sup>; and
- .6 be tested for electromagnetic compatibility taking into account the recommendations<sup>4</sup> developed by the Organization.

4.2 In addition to the provisions specified in paragraph 4.1 above, the shipborne equipment should provide the functionality specified in table 1.

# Table 1

Parameter	Comments	
Shipborne equipment Identifier	The identifier used by the shipborne equipment.	
Positional data	The Global Navigation Satellite System (GNSS) position (latitude and longitude) of the ship (based on the WGS 84 datum).	
	<i>Position</i> : The equipment should be capable of transmitting the GNSS position (latitude and longitude) of the ship (based on WGS 84 datum) as prescribed by regulation V/19-1, without human interaction on board the ship.	
	<i>On-demand</i> <sup>(1)</sup> <i>position reports</i> : The equipment should be capable of responding to a request to transmit LRIT information on demand without human interaction on board the ship, irrespective of where the ship is located.	
	<i>Pre-scheduled</i> <sup>(2)</sup> <i>position reports</i> : The equipment should be capable of being remotely configured to transmit LRIT information at intervals ranging from a minimum of 15 min to periods of 6 h to the LRIT Data Centre, irrespective of where the ship is located and without human interaction on board the ship.	
Time Stamp 1	The date and time <sup>(3)</sup> associated with the GNSS position. The equipment should be capable of transmitting the time <sup>(3)</sup> associated with the GNSS position with each transmission of LRIT information.	

#### DATA TO BE TRANSMITTED FROM THE SHIPBORNE EQUIPMENT

Notes: <sup>(1)</sup> On-demand position reports means transmission of LRIT information as a result of either receipt of polling command or of remote configuration of the equipment so as to transmit at interval other than the preset ones.

- <sup>(2)</sup> *Pre-scheduled position reports* means transmission of LRIT information at the preset transmit intervals.
- <sup>(3)</sup> All times should be indicated as Universal Coordinated Time (UTC).

<sup>&</sup>lt;sup>3</sup> This provision should not apply to ships using for the transmission of LRIT information any of the radio communication equipment provided for compliance with the provisions of chapter IV. In such cases, the shipborne equipment should be provided with sources of energy as specified in regulation IV/13.

<sup>&</sup>lt;sup>4</sup> Refer to resolution A.813(19) on General requirements for electromagnetic compatibility of all electrical and electronic ship's equipment.

4.3 The shipborne equipment should transmit the LRIT information using a communication system which provides coverage in all areas where the ship operates.

4.4 The shipborne equipment should be set to automatically transmit the ship's LRIT information at 6-hour intervals to the LRIT Data Centre identified by the Administration, unless the LRIT Data User requesting the provision of LRIT information specifies a more frequent transmission interval.

4.4.1 When a ship is undergoing repairs, modifications or conversions in dry-dock or in port or is laid up for a long period, the master or the Administration may reduce the frequency of the transmission LRIT information to one transmission every 24-hour period, or may temporarily stop the transmission of such information.

### 5 Application Service Providers

- 5.1 Application Services Provider(s) (ASPs) providing services to:
  - .1 a National LRIT Data Centre, should be recognized by the Contracting Government establishing the centre;
  - .2 a Regional or a Cooperative LRIT Data Centre, should be recognized by the Contracting Governments establishing the centre. In such a case, the arrangements for recognizing the ASPs should be agreed amongst the Contracting Governments establishing the centre; and
  - .3 an International LRIT Data Centre, should be recognized by the Committee.

5.2 Contracting Governments should provide to the Organization a list with the names and contact details of the ASPs they recognize together with any associated conditions of recognition and thereafter should, without undue delay, update the Organization as changes occur.

5.2.1 The Organization should communicate information it receives pursuant to the provisions of paragraph 5.2 and information in relation to the ASP(s) recognized by the Committee for providing services to the International LRIT Data Centre and any changes thereto to all Contracting Governments, all LRIT Data Centres, the International LRIT Data Exchange and the LRIT Coordinator.

5.3 An ASP function should:

- .1 provide a communication protocol interface between the Communication Service Providers and the LRIT Data Centre to enable the following minimum functionality:
  - .1 remote integration of the shipborne equipment into an LRIT Data Centre;
  - .2 automatic configuration of transmission of LRIT information;
  - .3 automatic modification of the interval of transmission of LRIT information;

- .4 automatic suspension of transmission of LRIT information;
- .5 on demand transmission of LRIT information; and
- .6 automatic recovery and management of transmission of LRIT information;
- .2 provide an integrated transaction management system for the monitoring of LRIT information throughput and routeing; and
- .3 ensure that LRIT information is collected, stored and routed in a reliable and secure manner.

5.4 The ASP where used should add the data identified in table 2 to each transmission of LRIT information:

# Table 2

# DATA TO BE ADDED BY AN APPLICATION SERVICE PROVIDER AND AT THE LRIT DATA CENTRE

Parameters	Comments
Ship Identity <sup>(1)</sup>	The IMO ship identification number <sup>(1)</sup> and MMSI for the ship.
Name of ship	Name of the ship which has transmitted the LRIT information in the English language using latin-1 alphabet and UTF-8 encoding.
Time Stamp 2	The date and time <sup>(2)</sup> the transmission of LRIT information is received by the ASP (if used).
Time Stamp 3	The date and time <sup>(2)</sup> the received LRIT information is forwarded from the ASP (if used) to the appropriate LRIT Data Centre.
LRIT Data Centre Identifier	The identity of the LRIT Data Centre to be clearly indicated by a Unique Identifier.
Time Stamp 4	The date and $\operatorname{time}^{(2)}$ the LRIT information is received by the LRIT Data Centre.
Time Stamp 5	The date and time <sup>(2)</sup> the transmission of LRIT information is forwarded from the LRIT Data Centre to an LRIT Data User.

Notes: <sup>(1)</sup> See regulation XI-1/3 and resolution A.600(15) on IMO ship identification number scheme.

<sup>(2)</sup> All times should be indicated as Universal Coordinated Time (UTC).

5.5 In addition to the provisions of paragraph 5.3, Administrations, Contracting Governments and the Committee may establish, in relation to the ASPs seeking their recognition, specific requirements as a condition of recognizing a particular ASP.

### 6 Communications Service Providers

6.1 Communications Service Providers (CSPs) provide services which link the various parts of the LRIT system using communications protocols in order to ensure the end-to-end secure transfer of the LRIT information. This requirement precludes the use of non-secure broadcast systems.

6.2 A CSP may also provide services as an ASP.

#### 7 LRIT Data Centre

- 7.1 All LRIT Data Centres should:
  - .1 establish and continuously maintain systems which ensure, at all times, that LRIT Data Users are only provided with the LRIT information they are entitled to receive as specified in regulation V/19-1;
  - .2 collect LRIT information from ships instructed by their Administrations to transmit the LRIT information to the centre;
  - .3 obtain, when requested to provide LRIT information transmitted by ships other than those which transmit the information to the centre, LRIT information from other LRIT Data Centres through the International LRIT Data Exchange;
  - .4 make available, when requested to provide LRIT information transmitted by ships which transmit the information to the centre, LRIT information transmitted to the centre to other LRIT Data Centres through the International LRIT Data Exchange;
  - .5 execute requests received from LRIT Data Users for polling of LRIT information or for change(s) in the interval(s) of transmission of LRIT information by a ship or a group of ships transmitting the information to the centre;
  - .6 relay, when required, requests received from LRIT Data Users through the International LRIT Data Exchange to the other LRIT Data Centres for polling of LRIT information or for change(s) in the interval(s) of transmission of LRIT information by a ship or a group of ships not transmitting the information to the centre;
  - .7 execute requests received through the International LRIT Data Exchange from other LRIT Data Centres for polling of LRIT information or for change(s) in the interval(s) of transmission of LRIT information by a ship or a group of ships transmitting the information to the centre;
  - .8 upon request disseminate to LRIT Data Users the LRIT information they are entitled to receive in accordance with the agreed arrangements and notify the LRIT Data User and the Administration when a particular ship stops transmitting LRIT information;

- .9 archive LRIT information from ships which transmit the information to the centre, for at least one year and until such time as the Committee reviews and accepts the annual report of the audit of its performance by the LRIT Coordinator. However, the archived LRIT information should provide a complete record of the activities of the centre between two consecutive annual audits of its performance;
- .10 for LRIT information archived within the last 4 days, send the LRIT information within 30 min of receiving a request;
- .11 for LRIT information archived between 4 and 30 days previously, send the LRIT information within 1 h of receiving a request;
- .12 for LRIT information archived more than 30 days previously, send the LRIT information within 5 days of receiving a request;
- .13 ensure using appropriate hardware and software, that LRIT information is backed-up at regular intervals, stored at suitable off-site location(s) and available as soon as possible in the event of disruption to ensure continuity of service;
- .14 maintain a record of the ships which transmit LRIT information to the centre including name of ship, IMO Ship identification number, call sign and Maritime Mobile Service Identity (MMSI);
- .15 use a standard protocol for communications and agreed protocols to connect with the International LRIT Data Exchange and the LRIT Data Distribution Plan server;
- .16 use a standard secure transmission method with the International LRIT Data Exchange and the LRIT Data Distribution Plan server;
- .17 use a secure authentication method with LRIT Data Users;
- .18 use a standard and expandable message format for communicating with the International LRIT Data Exchange and the LRIT Data Distribution Plan server;
- .19 use reliable connections (e.g., TCP) to ensure that the LRIT information is successfully received by the LRIT Data Centres;
- .20 add the appropriate data identified in table 2 to each transmission of LRIT information collect by the centre; and
- .21 have access to the current LRIT Data Distribution Plan and to earlier versions of the plan.

7.2 All LRIT Data Centres should comply with the relevant provisions of the Technical specifications for communications within the LRIT system<sup>5</sup> and of the Technical specifications for the LRIT Data Distribution Plan and should take into account the relevant provisions of the Technical specifications for the International LRIT Data Exchange.

<sup>&</sup>lt;sup>5</sup> Refer to MSC.1/Circ.1259 on Interim revised technical specifications for the LRIT system.

7.3 All Regional or Cooperative LRIT Data Centres and the International LRIT Data Centre should only internally route LRIT information transmitted by ships entitled to fly the flag of the Contracting Governments establishing or participating such centres and should automatically maintain journal(s) for all of the internally routed LRIT information. The journal(s) should only contain message header information which should be used for audit and invoicing purposes. The journal(s) should be transmitted to the International LRIT Data Exchange at regular intervals in order to be combined with the journal(s) maintained by the International LRIT Data Exchange.

- 7.4 Each LRIT Data Centre should:
  - .1 settle its financial obligations *vis-à-vis* the LRIT Data Centres which provide to it LRIT information and the International LRIT Data Exchange in a timely manner in accordance with the arrangements they have agreed;
  - .2 publish its charges, in a currency to be decided by the Contracting Government(s) establishing the centre and in Special Drawing Rights (SDR) together with the date(s) as from which the charges are effective, for:
    - .1 providing LRIT information transmitted by the shipborne equipment at preset intervals<sup>6,7</sup>;
    - .2 providing LRIT information transmitted by the shipborne equipment on demand<sup>8</sup>;
    - .3 remotely configuring the shipborne equipment so as to transmit at interval other than the preset<sup>9</sup> ones and for resetting the shipborne equipment to transmit at preset interval; and
    - .4 providing archived LRIT information which is the LRIT information received from a ship other than the last one,

and should update these as and when changes occur; and

- .3 transmit to the International LRIT Data Exchange information on its charges together with the currency they relate to and should update such information as and when changes occur.
- 7.5 The performance of all LRIT Data Centres should be audited by the LRIT Coordinator.

7.5.1 All LRIT Data Centres should cooperate and make available to the LRIT Coordinator the information required to enable the satisfactory completion of an audit of their performance.

7.5.2 All LRIT Data Centres should settle their financial obligations *vis-à-vis* the LRIT Coordinator in a timely manner in accordance with the arrangements they have agreed.

<sup>&</sup>lt;sup>6</sup> Refer to pre-scheduled position reports as defined in Note (2) in Table 1.

<sup>&</sup>lt;sup>7</sup> Preset intervals are the intervals specified in paragraph 4.4.

<sup>&</sup>lt;sup>8</sup> Refer to on demand reports as defined in Note (1) in Table 1.

<sup>&</sup>lt;sup>9</sup> Preset intervals are the intervals specified in paragraph 4.4.

7.6 When providing LRIT information to LRIT Data Users, other than to a SAR service, LRIT Data Centres should:

- .1 in case such information are not archived, utilize the current version of the LRIT Data Distribution Plan;
- .2 in case such information are archived, utilize the version(s) of the LRIT Data Distribution Plan which were applicable at the time the archived LRIT information requested were originally received; and
- .3 apply the geographical areas specified by the Contracting Governments concerned in the LRIT Data Distribution Plan and should not endeavour to resolve any issues which may arise when such areas are either not specified or overlap geographical areas specified by other Contracting Governments.

7.7 Notwithstanding the provisions of paragraph 7.1 and subject to the provisions of paragraph 17.2, all LRIT Data Centres should provide to SAR services, LRIT information transmitted by all ships located within the geographical area specified by the SAR service requesting the information so as to permit the rapid identification of ships which may be called upon to provide assistance in relation to the search and rescue of persons in distress at sea. The LRIT information should be provided irrespective of the location of the geographical area and should be provided even if the geographical area is outside the search and rescue region associated with the SAR service requesting the information (regulation V/19-1.12 refers).

# 8 National, Regional and Cooperative LRIT Data Centres

8.1 A Contracting Government may establish a National LRIT Data Centre. A Contracting Government establishing such a centre should provide relevant details to the Organization and thereafter should, without undue delay, update the information provided as and when changes occur.

8.2 A group of Contracting Governments may establish either a Regional or a Cooperative LRIT Data Centre. The arrangements for establishing such a centre should be agreed amongst the Contracting Governments concerned. One of the Contracting Governments establishing such a centre should provide relevant details to the Organization and thereafter should, without undue delay, update the information provided as and when changes occur.

8.3 Upon request, National, Regional and Cooperative LRIT Data Centres may provide services to Contracting Governments other than those establishing the centre.

8.3.1 The arrangements for providing services should be agreed between the LRIT Data Centre and the Contracting Government requesting the provision of the services.

8.3.2 The Contracting Government establishing the National LRIT Data Centre or one of the Contracting Governments establishing the Regional or Cooperative LRIT Data Centre should, if the centre provides services to Contracting Governments other than those which established the centre, provide relevant details to the Organization and thereafter should, without undue delay, update the information provided as and when changes occur.

8.4 National, Regional and Cooperative LRIT Data Centres may also serve as a National, Regional or Cooperative Vessel Monitoring System (VMS) and may require, as VMS, the transmission from ships of additional information, or of information at different intervals, or of information from ships which are not required to transmit LRIT information. VMSs may also perform other functions.

8.4.1 If a National, Regional or Cooperative LRIT Data Centre collects additional information from ships, it should transmit only the required LRIT information to the other LRIT Data Centres through the International LRIT Data Exchange.

# 9 International LRIT Data Centre

9.1 An International LRIT Data Centre recognized by the Committee should be established.

9.2 Contracting Governments not participating in a National, Regional or Cooperative LRIT Data Centre, or Contracting Governments having an interest in the establishment of an International LRIT Data Centre should cooperate, under the coordination of the Committee, with a view to ensuring its establishment.

9.3 Ships, other than those which are required to transmit LRIT information to either a National, Regional or Cooperative LRIT Data Centre, should transmit the required LRIT information to the International LRIT Data Centre.

9.4 An International LRIT Data Centre may, upon request, collect additional information from ships entitled to fly the flag of an Administration on the basis of specific arrangements concluded with the Administration concerned.

9.5 In addition to the provisions of section 7, the International LRIT Data Centre should comply with the provisions of the Technical specifications for the International LRIT Data Centre<sup>10</sup>.

# 10 International LRIT Data Exchange

10.1 An International LRIT Data Exchange recognized by the Committee should be established.

10.2 Contracting Governments should cooperate, under the coordination of the Committee, with a view to ensuring the establishment of the International LRIT Data Exchange.

10.3 The International LRIT Data Exchange should:

- .1 route LRIT information between LRIT Data Centres using the information provided in the LRIT Data Distribution Plan;
- .2 be connected to all LRIT Data Centres and the LRIT Data Distribution Plan server;
- .3 use a store and forward-buffer to ensure LRIT information is received;

<sup>&</sup>lt;sup>10</sup> Refer to MSC.1/Circ.1259 on Interim revised technical specifications for the LRIT system.

- .4 automatically maintain journal(s) containing message header information only which may be used for:
  - .1 invoicing functions and settlement of invoicing disputes; and
  - .2 audit purposes;
- .5 archive journal(s), for at least one year and until such time as the Committee reviews and accepts the LRIT Coordinator's annual report of the audit of its performance. However, the archived journal(s) should provide a complete record of the activities of the exchange between two consecutive annual audits of its performance;
- .6 receive journal(s) from Regional, Cooperative, and the International LRIT Data Centre and combine these journal(s) with its own journal(s);
- .7 prepare, as necessary, performance related statistical information based on the information contained in the journal(s);
- .8 use a standard protocol for communications agreed protocols to connect to with LRIT Data Centres and the LRIT Data Distribution Plan server;
- .9 use a standard secure access method with the LRIT Data Centres and the LRIT Data Distribution Plan server;
- .10 use a standard and expandable message format for communicating with the LRIT Data Centres and the LRIT Data Distribution Plan server;
- .11 use reliable connections (e.g., TCP) to ensure that the LRIT information is successfully received by the LRIT Data Centres;
- .12 not have the capability to archive LRIT information;
- .13 not have the capability to view or access the LRIT information;
- .14 have access to current LRIT Data Distribution Plan and to earlier versions of the plan; and
- .15 receive information from LRIT Data Centres in relation to the charges they levy when providing LRIT information, create a master list of charges for all LRIT Data Centres and transmit the master list of charges to an LRIT Data Centre on request.

10.4 The International LRIT Data Exchange should comply with the provisions of the Technical specifications for the International LRIT Data Exchange<sup>11</sup> and with the relevant provisions of the Technical specifications for communications within the LRIT system and of the Technical specifications for the LRIT Data Distribution Plan.

<sup>&</sup>lt;sup>11</sup> Refer to MSC.1/Circ.1259 on Interim revised technical specifications for the LRIT system.

# 10.5 The International LRIT Data Exchange should provide to:

- .1 the LRIT Coordinator off-line access to all journals; and
- .2 Contracting Governments and LRIT Data Centres off-line access only to their share of the journals which relates to the LRIT information they have requested and were provided with.

10.6 The performance of the International LRIT Data Exchange should be audited by the LRIT Coordinator.

10.6.1 The International LRIT Data Exchange should cooperate and make available to the LRIT Coordinator the information required to enable the satisfactory completion of an audit of its performance.

10.6.2 The International LRIT Data Exchange should settled its financial obligations *vis-à-vis* the LRIT Coordinator in a timely manner in accordance with the arrangements they have agreed.

# 11 LRIT Data Distribution Plan

11.1 The Organization should establish and maintain the LRIT Data Distribution Plan. The Organization should also host, build, operate and maintain the LRIT Data Distribution Plan server.

11.2 The LRIT Data Distribution Plan (the plan) should include:

- .1 a list indicating the unique LRIT identities of Contracting Governments, Search and rescue services entitled to receive LRIT information, LRIT Data Centres, the International LRIT Data Exchange, ASPs, the LRIT Data Distribution Plan server and the LRIT Coordinator;
- .2 for the purpose of the implementation of the provisions of regulation V/19-1.8.1, for each Contracting Government a list of geographical coordinates of points, taking into account the related provisions of the Technical specifications for the LRIT Data Distribution Plan<sup>12</sup>, based on the WGS 84 datum defining the geographical area:
  - .1 of the waters<sup>13</sup> landward of the baselines for measuring the breadth of the territorial sea of the Contracting Government concerned in accordance with international law;

<sup>&</sup>lt;sup>12</sup> Refer to MSC.1/Circ.1259 on Interim revised technical specifications for the LRIT system.

<sup>&</sup>lt;sup>13</sup> The baselines for measuring the breadth of the territorial sea of the Contracting Government concerned in accordance with international law, the lines of delimitation between the Contracting Governments concerned and States with adjacent coasts and the coast of the Contracting Government concerned including any landward waters within which any ship which is required to comply with the provisions of regulation V/19-1 is able to navigate.

- .2 of the territorial sea<sup>14</sup> of the Contracting Government concerned in accordance with international law;
- .3 between the coast of the Contracting Government concerned and a distance of 1,000 nautical miles from its coast. The Contracting Government concerned may, in lieu of defining the aforesaid area with reference to the geographical coordinate points defining its coast, define the area with reference to the geographical coordinate points of the baselines for measuring the breadth of the territorial sea of the Contracting Government concerned in accordance with international law; and
- .4 within which the Contracting Government concerned is seeking the provision of LRIT information pursuant to the provisions of regulation V/19-1.8.1.3, if other than that defined under subparagraph .3 above;
- .3 for the purpose of the implementation of the provisions of regulation V/19-1.9.1 the following information:
  - .1 the name of the Administration (together with its associated unique LRIT identity) which opts to exercise its right under the provisions of regulation V/19-1.9.1;
  - .2 the name(s) of the Contracting Government(s) (together with their associated unique LRIT identities) to which LRIT information about ships entitled to fly the flag of the aforesaid Administration shall not be provided pursuant to the provisions of paragraph V/19-1.8.1.3 together with the date and time as from which the decision of the Administration applies and any particulars thereof stated in the related communication to the Organization;
  - .3 in case of amendment, suspension or annulment such decisions of aforesaid Administration the salient details; and
  - .4 the date and time the Organization has received the related communication, including related amendment, suspension or annulment and the date and time the Organization has informed all Contracting Governments pursuant to the provisions of regulation V/19-1.9.2;
- .4 a list of ports and port facilities located within the territory and a list of places under jurisdiction of each Contracting Government together with the associated geographical coordinates of points (based on WGS 84 datum) in which ships that are required to comply with the provisions of regulation V/19-1 may enter or proceed to;

<sup>&</sup>lt;sup>14</sup> The baselines for measuring the breadth of the territorial sea and the outer limit of the territorial sea of the Contracting Government concerned in accordance with international law and the lines of delimitation of the territorial sea between the Contracting Governments concerned and States with opposite or adjacent coasts in accordance with international law.

- .5 a list indicating which LRIT Data Centre is collecting and archiving LRIT information for each of the Contracting Governments together with the related LRIT identifies;
- .6 a list indicating the Uniform Resource Locator/Uniform Resource Identifier (URL/URI) (Web Service Endpoint) of each LRIT Data Centre, the International LRIT Data Exchange and the LRIT Data Distribution Plan server;
- .7 a list indicating the ASPs providing services to each LRIT Data Centre together with the related LRIT identifies;
- .8 the contact details of Contracting Governments for LRIT-related matters;
- .9 the contact details of Search and rescue services entitled to receive LRIT information for LRIT-related matters;
- .10 information in relation to the ASPs recognized by each Contracting Governments together with any conditions attached to such recognitions, and their points of contact;
- .11 information in relation to each National, Regional and Cooperative LRIT Data Centre, the International LRIT Data Centre and the International LRIT Data Exchange, and their points of contact;
- .12 information in relation to the LRIT Coordinator, and its contact details;
- .13 information in relation to the LRIT Data Distribution Plan and its server and contact details of official(s) of the Organization who may be contacted for matters relating to the operation or maintenance of the plan or its server or for seeking help in relation to issues relating to or arising from the operation of the plan or its server; and
- .14 maintain a record of all previous versions of the plan together with the dates and times between which each version was in effect.
- 11.3 The LRIT Data Distribution Plan server should:
  - .1 allow the International LRIT Data Exchange, the LRIT Data Centres and the LRIT Coordinator to have access to the current version of the plan;
  - .2 provide earlier versions of the LRIT Data Distribution Plan to the International LRIT Data Exchange, the LRIT Data Centres and the LRIT Coordinator upon request;
  - .3 use a standard protocol for communications and agreed protocols to connect with the International LRIT Data Exchange and the LRIT Data Centres;
  - .4 use a standard secure transmission method with the International LRIT Data Exchange and the LRIT Data Centres;
- .5 use a standard and expandable message format for communicating with the International LRIT Data Exchange and the LRIT Data Centres;
- .6 use reliable connections (e.g., TCP) to ensure that the information in the plan is successfully received by the International LRIT Data Exchange and the LRIT Data Centres;
- .7 use industry standard file compression technology to reduce the size of the plan and its incremental updates when these are downloaded by the International LRIT Data Exchange and the LRIT Data Centres;
- .8 provide for the submission of the geographical areas in a standard industry format and use a consistent naming convention for the elements;
- .9 provide for uploading of the geographical areas in batch files in Geography Markup Language (GML) format;
- .10 maintain a unique number for each published version of the plan, incrementing each time a new version of the plan is published;
- .11 provide for the downloading of the plan and its incremental updates by the LRIT Data Centres and the International LRIT Data Exchange on the publishing of a new version of the plan;
- .12 archive all published versions of the plan and its incremental updates;
- .13 use a standard secure access methods with the Contracting Governments and the LRIT Coordinator; and
- .14 provide a web interface for the entry and amendment of information in the plan.

11.4 The LRIT Data Distribution Plan server should comply with the Technical specifications for LRIT Data Distribution Plan<sup>15</sup> and with the relevant provisions of the Technical specifications for communications within the LRIT system.

# 12 LRIT system security

12.1 LRIT communications using land-line links should provide for data security using methods such as:

- .1 authorization: Access should only be granted to those who are authorized to see the specific LRIT information;
- .2 authentication: Any party exchanging information within the LRIT system should require authentication before exchanging information;

<sup>&</sup>lt;sup>15</sup> Refer to MSC.1/Circ.1259 on Interim revised technical specifications for the LRIT system.

- .3 confidentiality: Parties running an application server should protect the confidentiality of the LRIT information to ensure that it is not disclosed to unauthorized recipients when it travels across the LRIT system; and
- .4 integrity: Parties exchanging LRIT information should ensure that the integrity of the LRIT information is guaranteed and that no data has been altered.

# **13** LRIT system performance

13.1 LRIT information should be available to an LRIT Data User within 15 min of the time it is transmitted by the ship.

13.2 On-demand LRIT information should be provided to an LRIT Data User within 30 min of the time the LRIT Data User requested the information.

13.3 The quality of service:

# Number of delivered LRIT information meeting latency requirements x 100% Total number of LRIT information requests

should be:

- .1 95% of the time over any 24-hour period; and
- .2 99% over any 1 month.

### 14 LRIT Coordinator

14.1 The LRIT Coordinator should be appointed by the Committee.

14.2 The LRIT Coordinator should assist in the establishment of the International LRIT Data Centre and/or International LRIT Data Exchange by:

- .1 participating in the development of any new technical specifications for the LRIT system or of any amendments to existing ones taking into account the provisions of regulation V/19-1, the present performance standards, the existing technical specifications and any related decisions of the Committee;
- .2 issuing, when requested by the Committee, requests for the submission of proposals for the establishment and operation of the International LRIT Data Centre and/or the International LRIT Data Exchange;
- .3 evaluating the management, operational, technical and financial aspects of the proposals received taking into account the provisions of regulation V/19-1, the present performance standards, the technical specifications for the LRIT system and any other related decisions of the Committee and submitting its recommendations in this respect for consideration by the Committee; and
- .4 participating, as and when requested by the Committee, in their testing and integration into the LRIT system and reporting its findings in this respect for consideration by the Committee.

14.3 The LRIT Coordinator should, taking into account the provisions of regulation V/19-1, the present performance standards, the technical specification for the LRIT system and any related decisions of the Committee:

- .1 upon request, of any party concerned or the Committee, undertake the investigation of operational or technical disputes or invoicing difficulties and make recommendations for their settlement to the parties concerned and the Committee, as appropriate;
- .2 participate, as and when requested by the Committee, in the testing and integration of LRIT Data Centre(s) into the LRIT system and report its finding in this respect for consideration by the Committee; and
- .3 participate, as and when requested by the Committee, in the testing of new or modified procedures or arrangements for communications between the International LRIT Data Exchange, the LRIT Data Centres and the LRIT Data Distribution Plan server and report its finding in this respect for consideration by the Committee.

14.4 The LRIT Coordinator should undertake a review of the performance of the LRIT system taking into account the provisions of regulation V/19-1, the present performance standards, the technical specification for the LRIT system and any related decisions of the Committee and should report its findings to the Committee at least annually. In this respect, the LRIT Coordinator should on an annual basis:

- .1 review the performance of ASPs (or CSPs when they act as ASPs) providing services to the International LRIT Data Centre;
- .2 audit the performance of all LRIT Data Centres based on archived information and their fee structures;
- .3 audit the performance of the International LRIT Data Exchange and its fee structure, if any; and
- .4 verify that Contracting Governments and Search and rescue services receive only the LRIT information they have requested and are entitled to receive.

14.5 In addition to reporting to the Committee on the performance of the LRIT system including any identified non-conformities, the LRIT Coordinator may make recommendations to the Committee, based on an analysis of its findings, with a view to improving the efficiency, effectiveness and security of the LRIT system.

14.6 The LRIT Coordinator should, for the purpose of performing the functions specified in paragraphs 14.2.4 and 14.3 to 14.5:

- .1 be given the required level of access, by the LRIT Data Centres and the International LRIT Data Exchange, to management, and to charging, technical and operational data;
- .2 collect and analyse samples of LRIT information provided to LRIT Data Users; I:\MSC\84\24-Add-2.doc

- .3 collect and analyse statistics compiled by LRIT Data Centres and the International LRIT Data Exchange; and
- .4 be given access to the current LRIT Data Distribution Plan and to earlier versions of the plan.

14.7 The LRIT Coordinator should establish and communicate to the Committee the charges it would be levying in order to recover the expenditure it incurs for providing the services specified in paragraphs 14.2 to 14.5.

14.7.1 The related charges should be paid to the LRIT Coordinator in accordance with agreed arrangements – taking into account the laws of the Contracting Government(s) concerned – as follows:

- .1 in relation to the evaluation of proposals for the establishment of the International LRIT Data Centre and/or the International LRIT Data Exchange (paragraph 14.2.3), by those submitting the related proposals;
- .2 when participating in the testing and integration of the International LRIT Data Centre and/or the International LRIT Data Exchange into the LRIT system (paragraph 14.2.4), by the International LRIT Data Centre and/or the International LRIT Data Exchange as the case may be;
- .3 when undertaking the investigation of operational or technical disputes or invoicing difficulties (paragraph 14.3.1) by the party requesting the service;
- .4 when participating in the testing and integration of LRIT Data Centre(s) into the LRIT system (paragraph 14.3.2) by the LRIT Data Centre(s) being tested or integrated;
- .5 when participating in the testing of new or modified procedures or arrangements for communications between the International LRIT Data Exchange, the LRIT Data Centres and the LRIT Data Distribution Plan server (paragraph 14.3.3), by the International LRIT Data Exchange and/or the LRIT Data Centre(s);
- .6 when reviewing the performance of ASPs (or CSPs when they act as ASPs) providing services to the International LRIT Data Centre (paragraph 14.4.1), by the ASPs concerned;
- .7 when auditing the performance and fee structures of LRIT Data Centres (paragraph 14.4.2), by the LRIT Data Centre concerned; and
- .8 when auditing the performance and fee structure of the International LRIT Data Exchange (paragraph 14.4.3), by the International LRIT Data Exchange.

14.7.2 The Organization should not be required to make any payments to the LRIT Coordinator for any work the LRIT Coordinator may be required to carry out pursuant to any of the provisions of paragraphs 14.2 to 14.5; or for reporting or making recommendations to the Committee pursuant to any of the provisions of paragraphs 14.2 to 14.5.

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14.7.3 Contracting Governments should not be responsible for making any direct payments to the LRIT Coordinator for the services it may be required to provide pursuant to any of the provisions of paragraphs 14.2 to 14.5. However, without prejudice as to the relations between Contracting Governments and the LRIT Data Centres the services of which may use, Contracting Governments may be required by LRIT Data Centres to pay fees for the LRIT information they request and receive which may contain elements to offset the charges paid by LRIT Data Centres to the LRIT Coordinator for the functions it performs. Notwithstanding the aforesaid, the Contracting Government which requests directly from the LRIT Coordinator the provision of a specific service should pay the LRIT Coordinator the relevant charges for the service it has requested.

# **15** Administrations

15.1 Each Administration should decide to which LRIT Data Centre ships entitled to fly its flag are required to transmit LRIT information.

15.2 Each Administration should provide to the selected LRIT Data Centre the following information for each of the ships entitled to fly its flag which is required to transmit LRIT information:

- .1 name of ship;
- .2 IMO Ship identification number;
- .3 call sign; and
- .4 Maritime Mobile Service Identity.

15.3 Upon the transfer of the flag of a ship which is required to transmit LRIT information from another State, the Administration whose flag the ship is now entitled to fly should provide, without undue delay, to the selected LRIT Data Centre in addition to the information specified in paragraph 15.2 the following information:

- .1 the effective date and time (UTC) of transfer; and
- .2 the State whose flag the ship was formally entitled to fly, if known.

15.4 Administrations should, without undue delay, update the LRIT Data Centre as and when changes to the information they have provided under paragraphs 15.2 and 15.3 occur.

15.5 Upon the transfer of the flag of a ship which is required to transmit LRIT information to another State or when the ship is to be taken permanently out of service, the Contracting Government of the State whose flag the ship was entitled to fly hitherto should provide, without undue delay, to the LRIT Data Centre the following information:

- .1 name of ship;
- .2 IMO Ship identification number;

- .3 the effective date and time (UTC) of the transfer, or when the ship was, or will be, taken permanently out of service; and
- .4 the State to which the flag of the ship has been transferred, if known.

15.6 Administrations should either provide the ASP(s) they recognize with relevant information taking into account the provisions of 15.2 to 15.5 or should make the necessary arrangements for the aforesaid information to be provided to the ASP(s) concerned by the selected LRIT Data Centre.

# **16 Contracting Governments**

- 16.1 Each Contracting Government should:
  - .1 obtain the LRIT information to which it is entitled to under the provisions of regulation V/19-1, and has requested, from the LRIT Data Centre designated under paragraph 15.1. Contracting Governments which have no ships entitled to fly their flag may receive the LRIT information they are entitled to under the provisions of regulation V/19-1 from any one of the LRIT Data Centres but should select one LRIT Data Centre from which they wish to receive the information. In such cases the Contracting Government concerned should, after reaching agreement with the LRIT Data Centre the services of which it would be using, inform accordingly the Organization and, without undue delay, update the information they have provided as and when changes;
  - .2 if it wishes to receive LRIT information pursuant to the provisions of regulation V/19-1.8.1.1, indicate to the LRIT Data Centre the criteria for receiving such information. If so decided the Contracting Government may give the LRIT Data Centre a standing order regarding the criteria for receiving LRIT information;
  - .3 if it wishes to receive LRIT information pursuant to the provisions of regulation V/19-1.8.1.2, indicate to the LRIT Data Centre the name and the IMO Ship identification number of the particular ship and either:
    - .1 the distance from a port; or
    - .2 a point in time,

from when it requires the provision of LRIT information transmitted by the ship. If so decided the Contracting Government may give the LRIT Data Centre a standing order regarding the criteria for receiving LRIT information. If the standing order is a distance from a port, the Contracting Government also has to inform the centre of the name of the port each ship is proceeding to;

.4 if it wishes to receive LRIT information pursuant to the provisions of regulation V/19-1.8.1.3, indicate the distance from its coast within which it requires the provision of LRIT information transmitted by ships. If so decided, the Contracting Government may give the LRIT Data Centre a standing order regarding the criteria for receiving LRIT information;

- .5 cooperate with a view of resolving any issues in connection with which flag a particular ship is entitled to fly; and
- .6 ensure either the destruction of all received LRIT information which is no longer in use or their archiving in a secure and protected manner.

16.2 In accordance with regulation V/19-1.8.2, Contracting Governments are obliged to communicate to the Organization and enter into the LRIT Data Distribution Plan the information specified in paragraph 11.2 and thereafter update such information as and when changes occur before requesting the provision of LRIT information pursuant to the provisions of regulation V/19-1.8.1.

16.3 Contracting Governments are advised that the LRIT system would not apply any restrictions pursuant to the provisions of either regulations V/19-1.8.2 and V/19-8.1.3 in relation to ships located within the waters landward of baselines or regulation V/19-18.1.4 in relation to ships located within territorial seas until such time that they have communicated to the Organization and provided in the LRIT Data Distribution Plan the required information.

# 17 Search and rescue services

17.1 Subject to the provisions of paragraph 7.7, search and rescue service when it wishes to receive LRIT information pursuant to the provisions of regulation V/19-1.12 should indicate to the LRIT Data Centre the criteria for receiving such information.

17.2 A Search and rescue service should request the provision of LRIT information only via the LRIT Data Centre serving the Contracting Government in whose territory the service is located.

17.3 Subject to the provisions of the national legislation of the Contracting Government concerned, search and rescue services should provide information when requested by the LRIT Coordinator to enable the holistic review of the performance of the LRIT system and for the investigation of any disputes.

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#### RESOLUTION MSC.264(84) (adopted on 16 May 2008)

## ESTABLISHMENT OF THE INTERNATIONAL LRIT DATA EXCHANGE ON AN INTERIM BASIS

#### THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO the provisions of regulation V/19-1 of the International Convention for the Safety of Life at Sea, 1974, as amended (the Convention) on the Long-range identification and tracking (LRIT) of ships and, in particular, that, as from 31 December 2008, ships shall transmit and Contracting Governments to the Convention (Contracting Governments) shall be able to receive, pursuant to the provisions of the regulation V/19-1, LRIT information transmitted by ships,

BEARING IN MIND that regulation V/19-1 entered into force on 1 January 2008,

RECALLING FURTHER the Revised performance standards and functional requirements on long-range identification and tracking of ships (the Revised performance standards) adopted by resolution MSC.263(84) provide in section 10.1 that an International LRIT Data Exchange recognized by the Committee should be established,

ALSO RECALLING the Arrangements for the timely establishment of the LRIT system adopted by resolution MSC.211(81) and, in particular, that the International LRIT Data Centre and the International LRIT Data Exchange should commence trials and testing of the LRIT system not later than 1 July 2008,

FURTHER RECALLING that, at its eighty-third session, it accepted the contingency offer from the United States in relation to the establishment and operation of the International LRIT Data Exchange on an interim basis and until such time the Committee would be able to make the necessary permanent arrangements and to this end adopted resolution MSC.243(83) on the Establishment of the International LRIT Data Exchange on an interim basis,

RECALLING ALSO that in operative paragraph 3 of resolution MSC.243(83) it requested the Secretariat to prepare, following any necessary consultations with the United States, a draft resolution on the establishment of an International LRIT Data Exchange on an interim basis, within the framework of regulation V/19-1.14, for consideration and adoption by the Committee at its eighty-fourth session,

MINDFUL of the key and pivotal role of the International LRIT Data Exchange in the LRIT system architecture,

DESIRING to put the necessary arrangements in place so as to ensure that the LRIT system becomes fully operational, as planned, on 31 December 2008,

HAVING CONSIDERED, at its eighty-fourth session, a report on the progress made by the United States in relation to the establishment and operation of the International LRIT Data Exchange on an interim basis,

1. RECOGNIZES, pursuant to the provisions of regulation V/19-1.14 and paragraph 10.1 of the Revised performance standards, the aforesaid exchange as the International LRIT Data Exchange referred to in the Revised performance standards subject to the terms and conditions set out in the Annex to the present resolution;

2. AGREES that, bearing in mind that the contingency offer from the United States is only an interim arrangement and a permanent solution should be found for the International LRIT Data Exchange as soon as possible (within two years as from 1 January 2008 subject to a further review by the Committee), at its eighty-fifth session, it would discuss with a view to finalizing the arrangements for the establishment and operation of the International LRIT Data Exchange on a permanent basis;

3. **REVOKES** resolution MSC.243(83).

# ESTABLISHMENT OF THE INTERNATIONAL LRIT DATA EXCHANGE ON AN INTERIM BASIS

The International LRIT Data Exchange is established and operated by the United States under the following conditions:

- 1 The International LRIT Data Exchange should comply with the salient provisions of:
  - (1) regulation V/19-1;
  - (2) the Revised performance standards;
  - (3) the technical specifications for the LRIT system<sup>1</sup>, other than those relating to the capability to move to an off-site location;
  - (4) the criteria for the location of the International LRIT Data Centre and the International LRIT Data Exchange, other than those relating to backup servers; and
  - (5) any guidance in relation to financial and operational matters issued by the Committee.

2 The International LRIT Data Exchange would be provided by the United States at their own expense and, in this respect, the United States has clarified that its intention is that consistent with their domestic laws and procurement regulations, the capital, operating and maintenance costs for the establishment and operation of the International LRIT Data Exchange would be borne by the United States. The intention of the United States is that neither the Organization nor any of the LRIT Data Centres nor any of the other Contracting Governments would be required to make any payment to the United States for the services provided bv the International LRIT Data Exchange.

3 The United States, while not withdrawing their reservation, during the eighty-second session of the Committee, with respect to the decision of Committee in relation to the appointment of the International Mobile Satellite Organization (IMSO) as the LRIT Coordinator, will cooperate fully and will meet all its obligations *vis-à-vis* IMSO as LRIT Coordinator in respect of participation of IMSO in the initial developmental and integration testing and in connection with the audit of the performance of the International LRIT Data Exchange within the framework established by regulation V/19-1 and sections 10 and 14 of the Revised performance standards.

4 The Contracting Governments, on the understanding that the LRIT information would be accessible in accordance with regulation V/19-1 and the Revised performance standards, agree that the United States does not assume any form of liability in case of any technical failure of the International LRIT Data Exchange.

<sup>&</sup>lt;sup>1</sup> Refer to MSC.1/Circ.1259 on Interim revised technical specifications for the LRIT system.

5 The Contracting Governments, on the understanding that the LRIT information would be accessible in accordance with regulation V/19-1 and the Revised performance standards, also agree that United States does not assume any form of liability in case the International LRIT Data Exchange needs to be temporarily shutting down for example due to denial of service or malicious attack.

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#### **DRAFT AMENDMENTS TO THE 1974 SOLAS CONVENTION**

# CHAPTER II-1 CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

### Part A-1 Structure of ships

#### **Regulation 3-3 – Safe access to tanker bows**

1 In paragraph 1, the references "VII/8.2" and "VII/11.2" are replaced by the references "VII/13.2" and "VII/16.2", respectively.

# CHAPTER II-2 CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

#### Part A General

#### **Regulation 1 – Application**

2 In paragraph 6.2, the references "VII/8.1" and "VII/11.1" are replaced by the references "VII/13.1" and "VII/16.1", respectively.

#### **Regulation 3 – Definitions**

- 3 In paragraph 11, the reference "VII/8.1" is replaced by the reference "VII/13.1".
- 4 In paragraph 25, the reference "VII/11.1" is replaced by the reference "VII/16.1".

#### Part G Special requirements

#### **Regulation 19 – Carriage of dangerous goods**

5 In note 10 to table 19.2, the words "the Code of Safe Practice for Solid Bulk Cargoes, adopted by resolution A.434(XI)" are replaced by the words "the International Maritime Solid Bulk Cargoes (IMSBC) Code, as adopted by resolution MSC....(..)".

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6 In paragraph 3.4, the existing title is replaced as follows:

"3.4 *Ventilation arrangement*".

# CHAPTER VI CARRIAGE OF CARGOES

## Part A General provisions

7 The following new regulation 1 is added before the existing regulation 1 and the subsequent regulations are renumbered accordingly:

# "Regulation 1 Definitions

For the purpose of this chapter, unless expressly provided otherwise:

1 *IMSBC Code* means the International Maritime Solid Bulk Cargoes Code adopted by the Maritime Safety Committee of the Organization by resolution MSC....(..), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I; and

2 *Solid bulk cargo* means any cargo, other than liquid or gas, consisting of a combination of particles, granules or any larger pieces of material generally uniform in composition, which is loaded directly into the cargo spaces of a ship without any intermediate form of containment."

# **Regulation 2 – Cargo information**

- 8 The existing paragraph 2.2 is replaced by the following:
  - ".2 in the case of solid bulk cargo, information as required by section 4 of the IMSBC Code."
- 9 The existing paragraph 2.3 is deleted.

10 The following new regulation 3 is added before the existing regulation 3 and the subsequent regulations are renumbered accordingly:

# "Regulation 3 Requirements for the carriage of solid bulk cargoes other than grain

The carriage of solid bulk cargoes other than grain shall be in compliance with the relevant provisions of the IMSBC Code."

# Regulation 3 – Oxygen analysis and gas detection equipment

11 In paragraph 1, the word "solid" is inserted in the first sentence, after the words "When transporting a".

# Part B Special provisions for bulk cargoes other than grain

12 The title of part B is replaced as follows:

# "Part B

#### Special provisions for solid bulk cargoes"

#### **Regulation 6 – Acceptability for shipment**

13 In existing paragraph 1, the word "solid" is inserted in the first sentence after the words "Prior to loading a".

14 The existing paragraphs 2 and 3 are deleted.

#### **Regulation 7 – Loading, unloading and stowage of bulk cargoes**

15 In the heading of the regulation, the word "solid" is inserted after the words "stowage of".

16 The existing paragraphs 4 and 5 are deleted and the subsequent paragraphs are renumbered accordingly.

# CHAPTER VII CARRIAGE OF DANGEROUS GOODS

17 Parts A-1 to D are re-lettered as Parts B to E.

18 Regulations 7-1, 7-2, 7-3 and 7-4 are renumbered as regulations 8, 10, 11 and 12, respectively, and the remaining regulations are renumbered accordingly.

19 In the existing regulation 7-1.3, the words "detailed instructions on the safe carriage of dangerous goods in solid form in bulk which shall include" are deleted.

20 The following new regulation 9 is added after renumbered regulation 8:

# "Regulation 9 Requirements for the carriage of dangerous goods in solid form in bulk

The carriage of dangerous goods in solid form in bulk shall be in compliance with the relevant provisions of the IMSBC Code, as defined in regulation VI/1.1."

# CHAPTER IX MANAGEMENT FOR THE SAFE OPERATION OF SHIPS

# **Regulation 1 – Definitions**

- 21 In paragraph 4, the reference "VII/8.2" is replaced by the reference "VII/13.2".
- In paragraph 5, the reference "VII/11.2" is replaced by the reference "VII/16.2".

# CHAPTER XI-2 SPECIAL MEASURES TO ENHANCE MARITIME SECURITY

# **Regulation 1 – Definitions**

- In paragraph 1.2, the reference "VII/8.2" is replaced by the reference "VII/13.2".
- In paragraph 1.3, the reference "VII/11.2" is replaced by the reference "VII/16.2".

# CHAPTER XII ADDITIONAL SAFETY MEASURES FOR BULK CARRIERS

#### **Regulation 8 – Information on compliance with requirements for bulk carriers**

In paragraph 1, the reference "VI/7.2" is replaced by the reference "VI/9.2".

# **Regulation 10 – Solid bulk cargo density declaration**

26 In paragraph 1, the reference "VI/2" is replaced by the reference "VI/4".

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# DRAFT AMENDMENTS TO THE INTERNATIONAL CODE FOR THE SAFE CARRIAGE OF PACKAGED IRRADIATED NUCLEAR FUEL, PLUTONIUM AND HIGH-LEVEL RADIOACTIVE WASTES ON BOARD SHIPS (INF CODE)

#### Chapter 1 – General

- 1 In regulation 1.1.1.8, the reference "VII/8.1" is replaced by the reference "VII/13.1".
- 2 In regulation 1.2.1, the reference "VII/15" is replaced by the reference "VII/20".

### Chapter 11 – Notification in the event of an incident involving INF cargo

3 In regulation 11.1, the reference "VII/7-1" is replaced by the reference "VII/8".

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#### RESOLUTION MSC.265(84) (adopted on 9 May 2008)

# AMENDMENTS TO THE REVISED GUIDELINES FOR APPROVAL OF SPRINKLER SYSTEMS EQUIVALENT TO THAT REFERRED TO IN SOLAS REGULATION II-2/12 (RESOLUTION A.800(19))

# THE MARITIME SAFETY COMMITTEE,

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

NOTING the significance of the performance and reliability of the sprinkler systems approved under provisions of regulation II-2/12 of the International Convention for the Safety of Life at Sea (SOLAS), 1974,

DESIROUS of keeping abreast of the advancement of sprinkler technology and further improving fire protection on board ships,

HAVING CONSIDERED, at its eighty-fourth session, the text of the proposed amendments to the Revised Guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12 (resolution A.800(19)),

1. ADOPTS the amendments to the Revised Guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12 (resolution A.800(19)), the text of which is set out in the annex to the present resolution;

2. INVITES Governments to apply the amendments when approving equivalent sprinkler systems on or after 9 May 2008.

# AMENDMENTS TO THE REVISED GUIDELINES FOR APPROVAL OF SPRINKLER SYSTEMS EQUIVALENT TO THAT REFERRED TO IN SOLAS REGULATION II-2/12 (RESOLUTION A.800(19))

1 The following new section 1-1 is added after the existing section 1:

# "1-1 APPLICATION

1-1.1 The present Guidelines apply to equivalent sprinkler systems installed on or after 9 May 2008.

1-1.2 Existing type approvals issued to confirm compliance of equivalent sprinkler systems with the Revised Guidelines, adopted by resolution A.800(19), should remain valid until 6 years after 9 May 2008.

1-1.3 Existing equivalent sprinkler systems installed before 9 May 2008, based on resolution A.800(19), should be permitted to remain in service as long as they are serviceable."

# **3 PRINCIPAL REQUIREMENTS FOR THE SYSTEM**

2 The existing paragraph 3.3 is replaced by the following:

"3.3 The sprinkler system should be capable of continuously supplying the water-based extinguishing medium for a minimum of 30 min. A pressure tank or other means should be provided to meet the functional requirement stipulated in the FSS Code, chapter 8, paragraph 2.3.2.1. The design of the system should ensure that full system pressure is available at the most remote nozzle in each section within 60 s of system activation."

3 The existing paragraphs 3.8 and 3.9 are replaced by the following:

"3.8 There should be not less than two sources of power for the system. Where the sources of power for the pump are electrical, these should be a main generator and an emergency source of power. One supply for the pump should be taken from the main switchboard, and one from the emergency switchboard by separate feeders reserved solely for that purpose. The feeders should be so arranged as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except in so far as it is necessary to reach the appropriate switchboards, and should be run to an automatic changeover switch situated near the sprinkler pump. This switch should permit the supply of power from the main switchboard so long as a supply is available there from, and be so designed that upon failure of that supply it will automatically change over to the supply from the emergency switchboard. The switches on the main switchboard and the emergency switchboard should be clearly labelled and normally kept closed. No other switch should be permitted in the feeders concerned. One of the sources of power supply for the system should be an emergency source. Where one of the sources of power for the pump is an internal combustion engine, it should, in addition to complying with the provisions of the FSS Code, chapter 8, paragraph 2.4.3, be so situated that a fire in any protected space

will not affect the air supply to the machinery. Pump sets consisting of two diesel engines each supplying at least 50% of the required water capacity are considered acceptable if the fuel supply is adequate to operate the pumps at full capacity for a period of 36 h on passenger ships and 18 h on cargo ships.

3.9 The system should be provided with a redundant means of pumping, including drivers, or otherwise supplying a water-based extinguishing medium to the sprinkler system. The capacity of the redundant means should be sufficient to compensate for the loss of any single supply pump or alternative source.

Failure of any one component in the power and control system should not result in a reduction of the automatic release capability or reduction of sprinkler pump capacity by more than 50%. Hydraulic calculations should be conducted to assure that sufficient flow and pressure are delivered to the hydraulically most remote 140 m<sup>2</sup> in the event of the failure of any one component."

4 The existing paragraph 3.13 is replaced by the following:

"3.13 Each section of sprinklers should be capable of being isolated by one stop valve only. The stop-valve in each section should be readily accessible in a location outside of the associated section or in cabinets within stairway enclosures. The valve's location should be clearly and permanently indicated. Means should be provided to prevent the operation of the stop-valves by an unauthorized person. Isolation valves used for service, maintenance or for refilling of antifreeze solutions may be installed in the sprinkler piping in addition to the section stop valves, if provided with a means for giving a visual and audible alarm as required by paragraph 3.17. Valves on the pump unit may be accepted without such alarms if they are locked in the correct position."

5 The existing paragraph 3.15 is replaced by the following:

"3.15 The sprinkler system water supply components should be outside category A machinery spaces and should not be situated in any space required to be protected by the sprinkler system."

6 The existing paragraph 3.19 is replaced by the following:

"3.19 Installation plans and operating manuals should be supplied to the ship and be readily available on board. A list or plan should be displayed showing the spaces covered and the location of the zone in respect of each section. Instructions for testing and maintenance should also be available on board. The maintenance instructions should include provisions for a flow test of each section at least annually to check for possible clogging or deterioration in the discharge piping."

7 The existing paragraph 3.22 is replaced by the following:

"3.22 Pumps and alternative supply components should be capable of supplying the required flow rate and pressure for the space with the greatest hydraulic demand. For the purposes of this calculation, the design area used to calculate the required flow and pressure should be the deck area of the most hydraulically demanding space, separated from adjacent spaces by A-class divisions. The design area need not exceed 280 m<sup>2</sup>. For application to a small ship with a total protected area of less than 280 m<sup>2</sup>,

the Administration may specify the appropriate area for sizing of pumps and alternate supply components."

3.23 The nozzle location, type of nozzle, and nozzle characteristics should be within the tested limits determined by the fire test procedures in appendix 2 to provide fire control or suppression as referred to in paragraph 3.2.

3.24 For atriums with intermediate level deck openings exceeding  $100 \text{ m}^2$ , ceiling mounted sprinklers are not required.

3.25 The system should be designed in such a way that during a fire occurrence, the level of protection provided to those spaces unaffected by fire is not reduced.

3.26 A quantity of spare water mist nozzles should be carried for all types and ratings installed on the ship as follows:

Total number of nozzles	Required number of spares		
< 300	6		
300 to 1000	12		
> 1000	24		

The number of spare nozzles of any type need not exceed the total number of nozzles installed of that type.

3.27 Any parts of the system which may be subjected to freezing temperatures in service should be suitably protected against freezing."

#### APPENDIX 1

#### COMPONENT MANUFACTURING STANDARDS FOR WATER MIST NOZZLES

8 In appendix 1, a new paragraph 5.21.4 is added as follows:

"5.21.4 Alternative supply arrangements to the apparatus shown in figure 3 may be used where damage to the pump is possible. Restrictions to piping defined by note 2 of table 5 should apply to such systems."

#### APPENDIX 2

# FIRE TEST PROCEDURES FOR EQUIVALENT SPRINKLER SYSTEMS IN ACCOMMODATION, PUBLIC SPACE AND SERVICE AREAS ON PASSENGER SHIPS

9 The existing title and the text of appendix 2 are replaced by the following:

# "APPENDIX 2

# FIRE TEST PROCEDURES FOR WATER MIST SYSTEMS IN ACCOMMODATION, PUBLIC SPACES AND SERVICE AREAS ON PASSENGER SHIPS

#### 1 SCOPE

1.1 These test procedures describe a fire test method for evaluating the effectiveness of water mist systems equivalent to systems covered by chapter 8 of the FSS Code in accommodation and service areas on board ships. It should be noted that the test method is limited to the systems' effectiveness against fire and is not intended for testing of the quality and design parameters of the individual components of the system.

1.2 In order to fulfil the requirements of paragraph 3.5 of the Guidelines, the system should be capable of fire control or suppression in a wide variety of fire loading, fuel arrangement, room geometry and ventilation conditions.

1.3 Products employing materials or having forms of construction differing from the requirements contained herein may be examined and tested in accordance with the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with this document.

1.4 Products complying with the text of this document will not necessarily be judged to comply, if, when examined and tested, they are found to have other features which impair the level of safety contemplated by this document.

#### 2 HAZARD AND OCCUPANCY CLASSIFICATION

For the purposes of identifying the different fire risk classifications, table 1 is given, which correlates the fire tests with the classification of occupancy defined in SOLAS regulations II-2/9.2.2.3 and II-2/9.2.2.4:

# Table 1 – Correlation between fire tests with the classification of occupancy defined in SOLAS regulations II-2/9.2.2.3 and 9.2.2.4

		Corresponding fire test				
Occupancy classification		Section 5 cabin	Section 5 corridor	Section 6 public spaces	Section 8 storage	
(1)	Control stations			X		
(2)	Stairways		X <sup>1</sup>			
(3)	Corridors		X <sup>1</sup>			
(6)	Accommodation spaces of minor fire risk	X <sup>2</sup>		X <sup>3</sup>		
(7)	Accommodation spaces of moderate fire risk	X <sup>2</sup>		X <sup>34</sup>		
(8)	Accommodation spaces of greater fire risk			X <sup>34</sup>		

	Corresponding fire test					
Occupancy classification		Section 5 cabin	Section 5 corridor	Section 6 public spaces	Section 8 storage	
(9)	Sanitary and similar spaces	X <sup>2</sup>		X <sup>3</sup>		
(11)	Refrigerated chambers			X		
(12)	Main galleys and annexes			X		
(13)	Store rooms, workshops, pantries, etc.				X	
(14)	Other spaces in which flammable liquids are stowed				X	

#### Notes:

- <sup>1</sup> For corridors and stairways wider than 1.5 m, use section 6 public space fire test instead of the corridor fire test.
- $^2$  For spaces up to the area of the cabin applied in tests of section 5.
- <sup>3</sup> For spaces over the area of the cabin applied in tests of section 5.
- <sup>4</sup> Refer to annex, item 3.24.

# **3 DEFINITIONS**

3.1 Fire suppression: sharply reducing the heat release rate of a fire and preventing its re-growth by means of a direct and sufficient application of water through the fire plume to the burning fuel surface.

3.2 Fire control: limiting the size of a fire by distribution of water so as to decrease the heat release rate and pre-wet adjacent combustibles, while controlling ceiling gas temperatures to avoid structural damage.

3.3 Fire source: fire source is defined as the combustible material in which the fire is set and the combustible material covering walls and ceiling.

3.4 Igniter: the device used to ignite the fire source.

#### 4 **GENERAL REQUIREMENTS**

#### 4.1 Nozzle positioning

The fire test procedures are intended for pressurized wet-pipe systems with individually activated (automatic) nozzles.

Water without any fire-extinguishing additives should be used, unless the additives have been approved for fire protection service by an independent authority. The approval of the additives should consider possible adverse health effects to exposed personnel, including inhalation toxicity.

These test procedures are applicable to either overhead nozzles installed on the ceiling, or sidewall nozzles installed on bulkheads below the ceiling. Separate approval tests should be conducted for each nozzle type.

The testing organization should be responsible for assuring that the nozzles for each fire test are installed in accordance with the manufacturer's design and installation instructions. The tests should be performed at the maximum specified spacings, installation height and distances below the ceiling. In addition, if the testing organization finds it necessary, selected fire tests should also be conducted at minimum specified spacings, installation height and distances below the ceiling. Where two types of nozzles are installed in the same area, an overlap of the different nozzle spray patterns should be provided equal to at least one half of the maximum approved nozzle spacing.

# 4.2 Water pressure and flow rates

The testing organization should be responsible for assuring that all fire tests are conducted at the operating pressure and flow rates specified by the manufacturer.

For all tests, the system should either be:

- .1 pressurized to the minimum operating pressure specified by the manufacturer. Upon activation of the first nozzle, the flowing water pressure should be maintained at the minimum system operating pressure; or
- .2 pressurized to the minimum stand-by pressure specified by the manufacturer. Upon activation of the first nozzle, the flowing water pressure should be gradually increased to the minimum system operating pressure, specified by the manufacturer. The delay time until the minimum system operating pressure is reached should be at least 15 s. The delay time recorded during the tests should be documented and included in the approval of the system.

#### 4.3 Temperature measurements

Temperatures should be measured as described in detail under each chapter. Chromelalumel thermocouple wires not exceeding 0.5 mm in diameter welded together should be used. The temperatures should be measured continuously, at least every 2 s, throughout the tests.

#### 4.4 Fire test hall and environmental conditions

The fire tests are to be conducted inside a well-ventilated fire test hall, in order to minimize enclosure effects affecting the outcome of the testing. The enclosure effects include accumulation of heat, smoke and water droplets within the test area.

The fire test hall should have an ambient temperature of  $20 \pm 5^{\circ}$ C at the start of each test. Standing water should not be permitted on the floor of the test hall at the start of each test. The suspended ceiling should be dry at the start of each test.

Details of the fire test hall geometry, the ventilation conditions as well as of the environmental conditions with respect to the above should be given in the fire test report.

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# 4.5 Tolerances

Unless otherwise stated, the following tolerances should apply:

.1	length	$\pm 2\%$ of value;
.2	volume	$\pm$ 5% of value;
.3	pressure	$\pm$ 3% of value; and
.4	temperature	$\pm$ 5% of value.

These tolerances are in accordance with ISO Standard 6182-1:1994.

# 4.6 Observations

The following observations should be made during and after each test:

- .1 time of ignition;
- .2 activation time of each nozzle;
- .3 time when water flow is shut off;
- .4 damage to the fire source;
- .5 temperature recordings;
- .6 system flow rate and pressure; and
- .7 total number of operating nozzles.

# 4.7 Fire sources

If the requirements for fire sources specified in the following sections of this test method cannot be fulfilled, it is the responsibility of the test laboratory to show that alternative materials used have burning characteristics similar to those of specified materials.

# 4.8 **Product and documentation requirements**

The fire test report should identify the critical parameters to be incorporated into the design, installation and operating instruction manual. The instruction manual should reference the limitations of each device and should include at least the following items:

- .1 description and operating details of each device and all accessory equipment, including identification of extinguishing system components or accessory equipment by part or model number;
- .2 nozzle design recommendation and limitations for each fire type;

- .3 type and pressure rating of pipe, tubing and fittings to be used;
- .4 equivalent length values of all fittings and all system components through which water flows;
- .5 discharge nozzle limitations, including maximum dimensional and area coverage, minimum and maximum installation height limitations, and nozzle permitted location in the protected volume;
- .6 range of filling capacities for each size storage container;
- .7 details for the proper installation of each device, including all component equipment;
- .8 reference to the specific types of detection and control panels (if applicable) to be connected to the equipment;
- .9 operating pressure ranges of the system;
- .10 method of sizing pipe or tubing;
- .11 recommended orientation of tee fittings and the splitting of flows through tees; and
- .12 maximum difference in operating (flowing) pressure between the hydraulically closest and most remote nozzle.

#### 5 CABIN AND CORRIDOR TESTS

#### 5.1 Test arrangement

5.1.1 The fire tests should be conducted in a 3 m x 4 m, 2.5 m high cabin connected to the centre of a 1.5 m x 12 m long corridor, 2.5 m high with both ends open. The cabin area may be increased up to the maximum size to be protected with one nozzle. The disabled nozzle test should be conducted in a 3 m x 4 m cabin.

5.1.2 The cabin should be fitted with one doorway opening, 0.8 m wide and 2.2 m high, which provides for a 0.3 m lintel above the opening.

5.1.3 The walls of the cabin should be constructed from an inner layer of nominally 12 mm thick non-combustible wall board with a nominally 45 mm thick mineral wool liner. The walls and ceiling of the corridor and ceiling of the cabin should be constructed of nominally 12 mm thick non-combustible wall boards. The cabin may be provided with a window, having a maximum area of  $1 \text{ m}^2$ , in the wall opposite the corridor for observation purposes during the fire tests.

5.1.4 The cabin and corridor ceiling should be covered with cellulosic acoustical panels. The acoustical panels should be nominally 12 mm to 15 mm thick and should not ignite when tested in accordance with part 3 of the FTP Code.

5.1.5 Plywood panels should be placed on the cabin and corridor walls. The panels should be 3 to 4 mm thick. The ignition time of the panel should be not more than 35 s and the flame spread time at 350 mm position should not be more than 100 s as measured in accordance with IMO resolution A.653(16).

# 5.2 Instrumentation

During each fire test, the following temperatures should be measured using thermocouples of diameter not exceeding 0.5 mm:

- .1 the ceiling surface temperature above the ignition source in the cabin should be measured with a thermocouple embedded in the ceiling material from above such that the thermocouple bead is flush with the ceiling;
- .2 the ceiling gas temperature should be measured with a thermocouple  $75 \pm 1$  mm below the ceiling in the centre of the cabin;
- .3 the ceiling surface temperature in the centre of the corridor, directly opposite the cabin doorway, should be measured with a thermocouple embedded in the ceiling material such that the thermocouple bead is flush with the ceiling (figure 1); and
- .4 the ceiling surface temperature directly above the corridor test fire source (if used) described in paragraph 5.4.2 should be measured with a thermocouple embedded in the ceiling material such that the thermocouple bead is flush with the ceiling surface.

Thermocouples intended for measuring ceiling surface temperatures should be imbedded in a shallow groove filled with thermally conductive cement such that the thermocouple bead is flush with the ceiling surface. The distance from the hole where the thermocouple wire penetrates the ceiling tile to the bead should be at least 25 mm.

# 5.3 Nozzle positioning

The nozzles should be installed to protect the cabin and corridor in accordance with the manufacturer's design and installation instructions subject to the following:

- .1 if only one ceiling nozzle is installed in the cabin, it may not be placed in the shaded area in figure 2;
- .2 if two or more ceiling nozzles are installed in the cabin the nominal water flux density should be homogeneously distributed throughout the cabin;
- .3 corridor nozzles should not be placed closer to the centreline of the cabin doorway than one half the maximum spacing recommended by the manufacturer. An exception is systems where nozzles are required to be placed outside each doorway; and
- .4 cabin mounted sidewall nozzles should be installed on the centreline of the front wall of the cabin adjacent to the doorway, aimed towards the rear of the cabin.

# 5.4 Fire sources

# 5.4.1 *Cabin test fire source*

Two pullman-type bunk beds having an upper and lower berth should be installed along the opposite side walls of the cabin (figure 1). The bunk beds should be made of nominally 1.5 mm thick steel and should have an outer dimension of approximately 2.0 m by 0.8 m. The bunk beds should have a 0.1 m high rim facing the long side wall of the cabin. No other rims are allowed in order to prevent accumulation of water onto the beds. Each bunk bed should be fitted with 2 m by 0.8 m by 0.1 m polyether mattresses having a cotton fabric cover. Pillows measuring 0.5 m by 0.8 m by 0.1 m should be cut from the mattresses. The cut edge should be positioned towards the doorway. A third mattress should form a backrest for the lower bunk bed. The backrest should be attached in an upright position in a way that prevents it from falling over (figure 3).

The mattresses should be made of non-fire retardant polyether and they should have a density of approximately  $33 \text{ kg/m}^3$ . The cotton fabric should not be fire retardant treated and it should have an area weight of 140 g/m<sup>2</sup> to 180 g/m<sup>2</sup>. When tested according to ISO Standard 5660-1:2002 (ASTM E-1354), the polyether foam should give results as given in the table below. The frame of the bunk beds should be of steel nominally 2 mm thick.

# ISO STANDARD 5660: Cone calorimeter test

**Test conditions**: Irradiance 35 kW/m<sup>2</sup>. Horizontal position.

Sample thickness 50 mm. No frame retainer should be used.

Test results	Foam
Time to ignition (s)	2-6
3 min average HRR, q180 $(kW/m^2)$	$270\pm50$
Minimum heat of combustion (MJ/kg)	25
Total heat release $(MJ/m^2)$	$50\pm12$

# 5.4.2 Corridor test fire source

The corridor fire tests should be conducted using eight piled polyether mattress pieces measuring 0.4 m x 0.4 m x 0.1 m, as specified in paragraph 5.4.1, without fabric covers. The pile should be placed on a stand, 0.25 m high, and in a steel test basket to prevent the pile from falling over (figure 4).

# 5.5 Test method

The following series of fire tests should be performed with automatic activation of the nozzle(s) installed in the cabin and/or corridor as indicated. Each fire should be ignited using an igniter made of some porous material, e.g., pieces of insulating fibreboard. The igniter may be either square or cylindrical, 60 mm square or 75 mm in diameter. The length should be 75 mm. Prior to the test the igniter should be soaked in 120 ml of heptane and positioned as indicated for each cabin fire test. For the corridor fire tests, the igniter should be located in the centre at the base of the pile of the mattress pieces, and on one side of the test stand at the base of the pile of mattress pieces:

- .1 lower bunk bed test. Fire arranged in one lower bunk bed and ignited with the igniter located at the front (towards door) centreline of the pillow;
- .2 upper bunk bed test. Fire arranged in one upper bunk bed with the igniter located at the front (towards door) centreline of the pillow;
- .3 arsonist test. Fire arranged by spreading 1 litre of white spirits evenly over one lower bunk bed and backrest 30 s prior to ignition. The igniter should be located in the lower bunk bed at the front (towards doorway opening) centreline of the pillow;
- .4 disabled nozzle test. The nozzle(s) in the cabin should be disabled. Fire arranged in one lower bunk bed and ignited with the igniter located at the front (towards door) centreline of the pillow. If nozzle(s) in the cabin are linked with nozzle(s) in the corridor such that a malfunction would affect them all, all cabin and corridor nozzles linked should be disabled;
- .5 corridor test. Fire source located against the wall of the corridor under one nozzle; and
- .6 corridor test. Fire source located against the wall of the corridor between two nozzles.

The fire tests should be conducted for 10 min after the activation of the first nozzle, and any remaining fire should be extinguished manually.

The door opening to the cabin is intended to be open during the tests according to paragraphs 5.5.1 through 5.5.4 and closed during the tests according to paragraphs 5.5.5 and 5.5.6.

# 5.6 Acceptance criteria

Based on the measurements, a maximum 30 s average value should be calculated for each measuring point which forms the temperature acceptance criteria.

1		Maximum 30 s average ceiling surface temperature	Maximum 30 s average ceiling gas temperature in the cabin	Maximum 30 s average ceiling surface temperature	Maximum acceptable damage on mattresses (%)		Other criteria
		in the cabin (°C)	(°C)	in the corridor (°C)	bunk	bunk	
Cabin tests	Lower bunk bed Upper bunk bed	360	320	120	40 N.A.	10 40	No nozzles in corridor allowed to operate <sup>3</sup>
	Arsonist	N.A.	N.A.	120	N.A.	N.A.	N.A.
	rridor ests	N.A.	N.A.	120 <sup>1</sup>	N.A.		Only two Independent and adjacent nozzles in corridor allowed to operate <sup>4</sup>
Disabl	ed nozzle	N.A.	N.A.	400 <sup>2</sup>	N.	A.	N.A.

#### Acceptance criteria for the cabin and corridor tests

#### Notes:

<sup>1</sup> In each test, the temperature should be measured above the fire source.

- <sup>2</sup> The fire is not allowed to propagate along the corridor beyond the nozzles closest to the door opening.
- <sup>3</sup> Not applicable, if cabin nozzle(s) are linked to corridor nozzle(s).
- <sup>4</sup> Not applicable, if corridor nozzle(s) are linked together.
- N.A. means not applicable.

#### 5.7 Damage calculations

After the test, the fire sources should be examined visually to determine compliance with the required maximum damage. The damages should be estimated using the following formula:

- .1 damage to lower bunk bed = (damage to horizontal mattress (%) + 0.25 x damage to pillow (%) + damage to backrest (%))/2.25;
- .2 damage to upper bunk bed = (damage to horizontal mattress (%) + 0.25 x damage to pillow (%))/1.25; and
- .3 if it is not clearly obvious by visual examination whether the criteria are fulfilled or not, the test should be repeated.

# 6 **PUBLIC SPACE FIRE TESTS**

# 6.1 Test arrangements

The fire tests should be conducted inside a well-ventilated fire test hall as described in item 4.4 under a suspended rectangular ceiling of at least  $80 \text{ m}^2$  in area with no dimensions less than 8 m. There should be at least 1 m space between the perimeters of the ceiling and any wall of the test hall. The ceiling height should be set at 2.5 m and 5 m, respectively.

The ceiling should be horizontal and smooth to allow an unobstructed horizontal flow of gases across the whole ceiling. No lintel is allowed around the perimeter of the ceiling and no opening is permitted in the ceiling. In order to be considered as smooth, the surface structure of the suspended ceiling should not have obstructions deeper than 15 mm.

The volume above the suspended ceiling, should be large enough, or be fitted with a natural or mechanical ventilation system, to vent the combustion gases away from the fire test area.

Details of the ceiling structure and its location in the fire test hall should be given in the fire test report.

Two different tests should be conducted as per paragraphs 6.1.1 and 6.1.2.

# 6.1.1 Open public space test

The fire source should be positioned under the centre of the open ceiling so that there is an unobstructed flow of gases across the ceiling. The ceiling should be constructed from a non-combustible material. At least  $1 \text{ m}^2$  of the ceiling just above ignition should be covered with acoustical panels. The acoustical panels should be nominally 12 mm to 15 mm thick, and should not ignite when tested in accordance with part 3 of the FTP Code.

# 6.1.2 Corner public space test

The test should be conducted in a corner constructed by two at least 3.6 m wide, nominally 12 mm thick, non-combustible wall boards. Plywood panels should be placed on the walls. The panels should be 3 to 4 mm thick. The ignition time of the panel should not be more than 35 s and the flame spread time at 350 mm position should not be more than 100 s measured in accordance with part 3 of the FTP Code. The ceiling should be covered, 3.6 m out from the corner, with cellulosic acoustical panels. The acoustical panels should be nominally 12 mm to 15 mm thick, and should not ignite when tested in accordance with part 3 of the FTP Code.

# 6.1.3 Verification of ventilation conditions

The ventilation rate of the test hall should be verified at the test hall configuration and ventilation conditions to be applied in the fire tests. The verification test should be conducted using a circular  $2 \text{ m}^2$  tray filled with at least 50 mm of light diesel oil on a water-base. Freeboard is to be  $150 \pm 10 \text{ mm}$ . The tray should be centrally located under the suspended open ceiling at the 2.5 m height The ventilation rate should be high enough to prevent the oxygen concentration measured at radius of 3 m from the centre point of the fire source, 1.25 m (mid-height) above the floor, to decrease below 20% volume during a 10 min free burning test.

The fire test report should include details of the ventilation test, if conducted as a part of the test series, or alternatively, reference should be provided to a ventilation test that was performed at the same configuration and ventilation conditions.

#### 6.2 Instrumentation

During each fire test, the following temperatures should be measured using thermocouples with diameter not exceeding 0.5 mm.

# 6.2.1 Open public space test:

- .1 the ceiling surface temperature above the ignition source should be measured using a thermocouple embedded in the ceiling material such that the thermocouple bead is flush with the ceiling surface; and
- .2 the ceiling gas temperature should be measured  $75 \pm 1$  mm below the ceiling, at four different positions, at a horizontal radius of 1.8 m from the point of ignition. The thermocouples should be oriented 90° relative to each other and positioned such as to minimize the risk for direct wetting by the water sprays from the nozzles.

#### 6.2.2 Corner public space test:

- .1 the ceiling surface temperature above the ignition source should be measured using a thermocouple embedded in the ceiling material such that the thermocouple bead is flush with the ceiling surface; and
- .2 the ceiling gas temperature should be measured using a thermocouple located  $75 \pm 1$  mm below the ceiling within 0.2 m horizontally from the closest nozzle to the corner.

Thermocouples intended for measuring ceiling surface temperatures should be imbedded in a shallow groove filled with thermally conductive cement such that the thermocouple bead is flush with the ceiling surface. The distance from the hole where the thermocouple wire penetrates the ceiling tile to the bead should be at least 25 mm.

# 6.3 Nozzle positioning

# 6.3.1 Open and corner public space tests

For nozzles with frame arms, tests should be conducted with the frame arms positioned both perpendicular and parallel with the edges of the ceiling or corner walls. For nozzles without framed arms, the nozzles should be oriented so that the lightest discharge density will be directed towards the fire area.

# 6.3.2 Open public space tests

When sofas are positioned between two nozzles, the longitudinal centreline gap between sofas No.1 and No.2 should be oriented at a  $90^{\circ}$  angle to the line between the nozzles.

# 6.4 Fire sources

# 6.4.1 Open public space

The fire source should consist of four sofas made of mattresses as specified in section 5.4.1 installed in steel frame sofas. The steel frames for the sofas should consist of rectangular bottom and backrest frames constructed of  $25 \pm 2$  mm square iron of normally 2 mm thickness. The dimensions of the bottom frame should be 2,000 mm x 700 mm and the dimensions of the backrest frame should be 2,000 mm x 725 mm. The seat and backrest mattresses should be supported on each frame by three vertical and one horizontal steel bars, constructed from similar steel stock. The vertical steel bars should be spaced every 500 mm and welded to the inner long sides of the frame. The horizontal steel bar should be welded to the inner short sides of the frame. Both steel frames should be fitted with a 150 mm by 150 mm steel plate, nominally 2 mm thick. The steel plate should be positioned directly under and behind the intended position of the igniter, in order to prevent it from falling to the floor under a test. Each sofa should have a rectangular armrest on each end. The armrest should be constructed of similar steel stock and should be 600 mm in length and 300 mm in height. The front section of the armrest should be attached to the bottom frame 70 mm from the backrest frame. The assembled frames should be supported by four legs constructed of similar steel stock. The two rear legs should be 205 mm in height and the front legs should be 270 mm in height. When installed, the mattress forming the seat should be installed first, with its long side edge close up against the backrest frame. The mattress forming the backrest should be installed thereafter. This mattress should be kept in upright position by four hooks, two on the short sides and two on the long sides of the backrest frame (see figure 5). The hooks should be constructed from nominally 50 mm flat iron bars, of nominally 2 mm thickness. The sofas should be positioned as shown in figure 6, with the top of the backrests spaced 25 mm apart.

One of the middle sofas should be ignited, centrically and at the bottom of the backrest, with an igniter as described in section 5.5.

# 6.4.2 Corner public space test

The fire source should consist of a sofa, as specified in 6.4.1, placed with the backrest 25 mm from the right-hand wall and close up to the left-hand wall. A target sofa should be placed along the right-hand wall with the seat cushion 0.1 m from the first sofa

and another target sofa should be placed 0.5 m from it on the left hand side. The sofa should be ignited using an igniter, as described in 5.5, that should be placed at the far left of the corner sofa, at the base of the backrest, near the left-hand wall (figure 7).

# 6.5 Test method

The fire tests should be conducted for 10 min after the activation of the first nozzle, and any remaining fire should be extinguished manually.

# 6.5.1 Open public space tests

Fire tests should be conducted with the ignition centred under one, between two and below four nozzles. An additional test should be conducted with the ignition centred under a disabled nozzle.

#### 6.5.2 Corner public space test

The fire tests should be conducted with at least four nozzles arranged in a 2 x 2 matrix.

#### 6.6 Acceptance criteria

Based on the measurements, a maximum 30 s average value should be calculated for each measuring point which forms the temperature acceptance criteria.

		Maximum 30 s average ceiling surface temperature (°C)	Maximum 30 s average ceiling gas temperature (°C)	Maximum acceptable Damage on mattresses (%)
	normal	360	$220^{2}$	50/35 <sup>1</sup>
Open space	disabled nozzle	N.A.	N.A.	70
Cor	ner	360	220	50/35 <sup>1</sup> (ignition sofa) No charring of target sofas

#### 6.6.1 Acceptance criteria for the public space tests

Notes:

- <sup>1</sup> 50% is the upper limit for any single test. 35% is the upper limit for the average of the public space tests required in 6 at each ceiling height (excluding the disabled sprinkler test).
- <sup>2</sup> The gas temperature should be measured at four different positions and the evaluation of the results is based on the highest reading.
- N.A. means not applicable.

#### 7 STORAGE AREA FIRE TESTS

#### 7.1 Test arrangements

The fire tests should be conducted inside a well-ventilated fire test hall as described in paragraph 4.4 under a suspended ceiling as described in paragraph 6.1 installed at 2.5 m height.

# 7.2 Instrumentation

No temperature measurements are required.

# 7.3 Nozzle positioning

As per paragraph 6.3.

# 7.4 Fire source

The fire source should consist of two central, 1.5 m high, solid piled stacks of cardboard boxes packed with polystyrene unexpanded plastic cups upside down with a 0.3 m flue space. Each stack should be approximately 1.6 m long and 1.1 m to 1.2 m wide.

A suitable plastic commodity is the FMRC standard plastic commodity. Similar commodities might be used if they are designed in a similar way and are proven to have the same burning characteristics and suppressability. In each test, new dry commodities should be used.

The fire source should be surrounded by six 1.5 m high solid piled stacks of empty cardboard boxes forming a target array to determine if the fire will jump the aisle. The boxes should be attached to each other, for example by staples, to prevent them from falling over (figure 8).

# 7.5 Test method

Fire tests should be conducted with the ignition centred under one, between two and below four nozzles. Each fire should be ignited using two igniters as described in 5.5. The igniters should be placed on the floor, each against the base of one of the two central stacks and ignited simultaneously. The fire tests should be conducted for 10 min after the activation of the first nozzle, and any remaining fire should be extinguished manually.

When positioned between two nozzles, the gap between the two centric stacks of commodities should be positioned at  $90^{\circ}$  to the line between the nozzles.

# 7.6 Acceptance criteria

- .1 no ignition or charring of the target cartons is allowed; and
- .2 no more than 50% of the cartons filled with plastic cups should be consumed."


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Figure 2



Figure 3

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Figure 4



Assembled sofa (front view)



Assembled sofa (side view)



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Figure 6



Plan view



<u>A - A</u>

Figure 7



Plan view



Front view

Cardboard cartons packed with polystyreneplastic cups

Empty boxes as target arrays

# Figure 8

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#### ANNEX 15

#### **DRAFT AMENDMENTS TO SOLAS CHAPTER II-2**

## CHAPTER II-2 CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

#### Part A General

#### **Regulation 1 – Application**

1 The following new paragraph 2.3 is added:

"2.3 The following ships, with cargo spaces intended for the carriage of packaged dangerous goods, shall comply with regulation 19.3, except when carrying dangerous goods specified as classes 6.2 and 7 and dangerous goods in limited quantities<sup>\*\*</sup> in accordance with tables 19.1 and 19.3 not later than the date of the first renewal survey on or after the [*date of entry into force*]:

- .1 passenger ships and cargo ships of 500 gross tonnage and upwards constructed on or after 1 September 1984 but before [*date of entry into force*]; and
- .2 cargo ships of less than 500 gross tonnage constructed on or after 1 February 1992 but before [*date of entry into*].

Notwithstanding these provisions:

- .3 passenger ships and cargo ships of 500 gross tonnage and upwards constructed on or after 1 September 1984 but before 1 July 1986 need not comply with regulation 19.3.3 provided that they comply with regulation 54.2.3 as adopted by resolution MSC.1(XLV);
- .4 passenger ships and cargo ships of 500 gross tonnage and upwards constructed on or after 1 July 1986 but before 1 February 1992 need not comply with regulation 19.3.3 provided that they comply with regulation 54.2.3 as adopted by resolution MSC.6(48);
- .5 passenger ships and cargo ships of 500 gross tonnage and upwards constructed on or after 1 September 1984 but before 1 July 1998 need not comply with regulations 19.3.10.1 and 19.3.10.2; and
- .6 cargo ships of less than 500 gross tonnage constructed on or after 1 February 1992 but before 1 July 1998 need not comply with regulations 19.3.10.1 and 19.3.10.2.

<sup>\*</sup> Refer to chapter 3.4 of the IMDG Code.

<sup>&</sup>lt;sup>\*\*</sup> Refer to chapter 3.5 of the IMDG Code."

## Part C Suppression of fire

## **Regulation 9 – Containment of fire**

2 The last sentence of paragraph 4.1.1.2 is moved to a new separate paragraph 4.1.1.3 and the existing following paragraphs are renumbered accordingly.

3 The following text is added at the end of paragraph 4.1.1.2:

"Doors approved without the sill being part of the frame, which are installed on or after [*date of entry into force*], shall be installed such that the gap under the door does not exceed 12 mm. A non-combustible sill shall be installed under the door such that floor coverings do not extend beneath the closed door."

4 The following text is added at the end of paragraph 4.1.2.1:

"Doors approved without the sill being part of the frame, which are installed on or after [*date of entry into force*], shall be installed such that the gap under the door does not exceed 25 mm."

5 In paragraph 4.2.1, the following text is added after the first sentence:

"Doors approved as "A" class without the sill being part of the frame, which are installed on or after [*date of entry into force*], shall be installed such that the gap under the door does not exceed 12 mm and a non-combustible sill shall be installed under the door such that floor coverings do not extend beneath the closed door. Doors approved as "B" class without the sill being part of the frame shall be installed such that the gap under the door does not exceed 25 mm."

6 In paragraph 7.1.1, in the first and second sentences, the words "non-combustible" are replaced by the words "steel or equivalent".

7 At the beginning of paragraph 7.1.1.1, the words "subject to paragraph 7.1.1.2" are added and the word "a" before the word "material" is replaced by the word "any".

8 The following new paragraph 7.1.1.2 is added after the existing paragraph 7.1.1.1 and the existing subsequent paragraphs are renumbered accordingly:

".2 on ships constructed on or after [*date of entry into force*], the ducts shall be made of heat resisting non-combustible material, which may be faced internally and externally with membranes having low flame-spread characteristics and, in each case, a calorific value<sup>\*\*</sup> not exceeding 45 MJ/m<sup>2</sup> of their surface area for the thickness used;

<sup>&</sup>lt;sup>\*\*</sup> Refer to the recommendations published by the International Organization for Standardization, in particular publication ISO 1716:2002, *Determination of calorific potential*."

9 In paragraph 7.4.4.2, the words "non-combustible" are replaced by the words "steel or equivalent".

10 In paragraph 7.4.4.3, the words "non-combustible" are replaced by the words "steel or equivalent".

11 At the beginning of paragraph 7.4.4.3.1, the words "subject to paragraph 7.4.4.3.2" are added and the word "a" before the word "material" is replaced by the word "any".

12 The following new paragraph 7.4.4.3.2 is added after the existing paragraph 7.4.4.3.1 and the existing subsequent paragraphs are renumbered accordingly:

".3.2 on ships constructed on or after [*date of entry into force*], the ducts shall be made of heat resisting non-combustible material, which may be faced internally and externally with membranes having low flame-spread characteristics and, in each case, a calorific value<sup>\*</sup> not exceeding 45 MJ/m<sup>2</sup> of their surface area for the thickness used;"

13 At the end of paragraph 7.5.2.1.2, the words "and, in addition, a fire damper in the upper end of the duct" are added.

## **Regulation 10 – Fire fighting**

14 The following new paragraph 10.2.6 is inserted after the existing paragraph 10.2.5:

"10.2.6 Passenger ships carrying more than 36 passengers constructed on or after [*date of entry into force*] shall be fitted with a suitably located means for fully recharging breathing air cylinders, free from contamination. The means for recharging shall be either:

- .1 breathing air compressors supplied from the main and emergency switchboard, or independently driven, with a minimum capacity of 60 *l*/min per required breathing apparatus, not to exceed 420 *l*/min; or
- .2 self-contained high-pressure storage systems of suitable pressure to recharge the breathing apparatus used on board, with a capacity of at least 1,200 l per required breathing apparatus, not to exceed 50,000 l of free air."

Refer to the recommendations published by the International Organization for Standardization, in particular publication ISO 1716:2002, *Determination of calorific potential*."

## Part G Special requirements

## **Regulation 19 – Carriage of dangerous goods**

- 15 The existing note 1 to table 19.1 is replaced by the following:
  - <sup>(1)</sup> For classes 4 and 5.1 solids not applicable to closed freight containers. For classes 2, 3, 6.1 and 8 when carried in closed freight containers the ventilation rate may be reduced to not less than two air changes per hour. For classes 4 and 5.1 liquids when carried in closed freight containers, the ventilation rate may be reduced to not less than two air changes per hour. For the purpose of this requirement a portable tank is a closed freight container."

16 In note 10 to table 19.2, the words "the Code of Safe Practice for Solid Bulk Cargoes, adopted by resolution A.434(XI)" are replaced by the words "the International Maritime Solid Bulk Cargoes (IMSBC) Code, as adopted by resolution MSC....(...)".

17 The existing table 19.3 is replaced by the following table:

Class Regulation 19	1.1 to 1.6	1.4S	2.1	2.2	2.3 flammable	2.3 non-flammable	$3 \text{ FP}^{15} < 23^{\circ}C$	3 $\text{FP}^{15} \ge 23^{\circ}C$ to $\le 60^{\circ}C$	4.1	4.2	4.3 liquids	4.3 solids	5.1	5.2 <sup>16</sup>	6.1 liquids $FP^{15} < 23^{\circ}C$	6.1 liquids $FP^{15} \ge 23^{\circ}C$ to $\le 60^{\circ}C$	6.1 liquids	6.1 solids	8 liquids $FP^{15} < 23^{\circ}C$	8 liquids $FP^{15} \ge 23^{\circ}C$ to $\le 60^{\circ}C$	8 liquids	8 solids	6
3.1.1	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
3.1.2	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	-
3.1.3	Х	-	-	I	I	I	-	1	I	I	-	-	I	I	I	I	-	1	-	-	I	1	-
3.1.4	Х	-	-	I	I	I	-	1	I	I	-	-	I	I	I	I	-	1	-	-	I	1	-
3.2	Х	-	Х	-	Х	-	Х	1	-	-	X <sup>18</sup>	-	-	1	Х	-	-	1	Х	-	1	-	X <sup>17</sup>
3.3	Х	Х	Х	Х	-	Х	Х	Х	Х	Х	Х	Х	Х	-	Х	Х	Х	Х	Х	Х	Х	Х	-
3.4.1	-	-	Х	I	I	Х	Х	1	X <sup>11</sup>	X <sup>11</sup>	Х	Х	X <sup>11</sup>	I	Х	Х	-	X <sup>11</sup>	Х	Х	I	1	X <sup>11</sup>
3.4.2	-	-	Х	-	-	-	Х	-	-	-	-	-	-	-	Х	-	-	-	Х	-	-	-	$X^{17}$
3.5	-	-	-	I	I	I	Х	1	I	I	-	-	I	I	Х	Х	Х	1	Х	X <sup>19</sup>	X <sup>19</sup>	1	-
3.6	-	-	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	$X^{14}$
3.7	-	-	-	-	-	-	Х	Х	Х	Х	Х	Х	Х	-	Х	Х	-	-	Х	Х	-	-	-
3.8	$X^{12}$	-	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	X <sup>13</sup>	Х	Х	Х	-	-	Х	Х	-	-	-
3.9	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	X
3.10.1	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Χ
3.10.2	Х	Х	Х	Х	Χ	Х	Х	Χ	Χ	Χ	Х	Х	Х	Χ	Χ	Χ	Χ	Χ	Χ	Х	Χ	Х	X

## "Table 19.3 – Application of the requirements to different classes of dangerous goods except solid dangerous goods in bulk

- <sup>11</sup> When "mechanically-ventilated spaces" are required by the IMDG Code, as amended.
- <sup>12</sup> Stow 3 m horizontally away from the machinery space boundaries in all cases.
- <sup>13</sup> Refer to the IMDG Code, as amended.
- <sup>14</sup> As appropriate for the goods to be carried.
- <sup>15</sup> FP means flashpoint.
- <sup>16</sup> Under the provisions of the IMDG Code, as amended, stowage of class 5.2 dangerous goods under deck or in enclosed ro-ro spaces is prohibited.
- <sup>17</sup> Only applicable to dangerous goods evolving flammable vapour listed in the IMDG Code.

- <sup>18</sup> Only applicable to dangerous goods having a flashpoint less than 23°C listed in the IMDG Code.
- <sup>19</sup> Only applicable to dangerous goods having a subsidiary risk class 6.1."

18 In paragraph 2.1, the words "and excepted quantities" with the following footnote are added after the text "except when carrying dangerous goods in limited quantities":

"Refer to chapter 3.5 of the IMDG Code."

19 In paragraph 3.4, the existing title is replaced as follows:

"3.4 Ventilation arrangement".

20 The following text is added at the end of the first sentence of paragraph 3.6.1:

"and shall be selected taking into account the hazards associated with the chemicals being transported and the standards developed by the Organization according to the class and physical state<sup>\*</sup>.

21 At the end of paragraph 4, the words "and excepted quantities" are added.

\*\*\*

<sup>\*</sup> For solid bulk cargoes, the protective clothing should satisfy the equipment provisions specified in the respective schedules of the IMSBC Code for the individual substances. For packaged goods, the protective clothing should satisfy the equipment provisions specified in emergency procedures (EmS) of the Supplement to the IMDG Code for the individual substances."

#### ANNEX 16

#### DRAFT AMENDMENTS TO THE 2000 HSC CODE

## CHAPTER 7 FIRE SAFETY

- 1 The existing note 1 to table 7.17-1 is replaced by the following:
  - <sup>41</sup> For classes 4 and 5.1 solids not applicable to closed freight containers. For classes 2, 3, 6.1 and 8 when carried in closed freight containers the ventilation rate may be reduced to not less than two air changes per hour. For classes 4 and 5.1 liquids when carried in closed freight containers, the ventilation rate may be reduced to not less than two air changes per hour. For the purpose of this requirement a portable tank is a closed freight container."
- 2 The existing table 7.17-3 is replaced by the following:

#### "Table 7.17-3

Class	1.1 to 1.6	1.4S	2.1	2.2	2.3 flammable	2.3 non-flammable	$3 \text{ FP}^{12} < 23^\circ C$	3 FP <sup>12</sup> $\ge 23^{\circ}C$ to $\le 60^{\circ}C$	4.1	4.2	4.3 liquids	4.3 solids	5.1	5.2 <sup>13</sup>	6.1 liquids $FP^{12} < 23^{\circ}C$	6.1 liquids $FP^{12} \ge 23^{\circ}C$ to $\le 60^{\circ}C$	6.1 liquids	6.1 solids	8 liquids $FP^{12} < 23^{\circ}C$	8 liquids $FP^{12} \ge 23^{\circ}C$ to $\le 60^{\circ}C$	8 liquids	8 solids	6
7.17.3.1.1	X	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
7.17.3.1.2	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	-
7.17.3.1.3	Χ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.17.3.1.4	Х	-	-	-	-	-	-	-	I	I	I	-	-	-	I	-	I	I	-	-	-	-	-
7.17.3.2	Х	-	Х	-	Х	-	Х	-	1	1	X <sup>15</sup>	-	-	-	Х	-	1	1	Х	-	-	-	X <sup>14</sup>
7.17.3.3	Х	Х	Х	Х	-	Х	Х	Х	Х	Х	Х	Х	Х	-	Х	Х	Х	Х	Х	Х	Х	Х	-
7.17.3.4.1	-	-	Х	-	-	Х	Х	-	$X^8$	$X^8$	Х	Х	<b>X</b> <sup>8</sup>	-	Х	Х	-	$X^8$	Х	Х	-	-	$X^8$
7.17.3.4.2	-	-	Х	-	-	-	Х	-	-	-	-	-	-	-	Х	-	-	-	Х	-	-	-	X <sup>14</sup>
7.17.3.5	-	-	-	-	-	-	Х	-	-	-	-	-	-	-	Х	Х	Х	-	Х	X <sup>16</sup>	X <sup>16</sup>	-	-
7.17.3.6	-	-	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	X <sup>11</sup>
7.17.3.7	-	-	-	-	-	-	Х	Х	Х	Х	Х	Х	Χ	-	Х	Х	-	-	Х	Х	-	-	-
7.17.3.8	X <sup>9</sup>	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	$X^{10}$	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
7.17.3.9	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
7.17.3.10	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х

# Application of the requirements of section 7.17.3 to different classes of dangerous goods except solid dangerous goods in bulk

- <sup>8</sup> When "mechanically-ventilated spaces" are required by the IMDG Code, as amended.
- <sup>9</sup> Stow 3 m horizontally away from the machinery space boundaries in all cases.
- <sup>10</sup> Refer to the IMDG Code, as amended.
- <sup>11</sup> As appropriate for the goods to be carried.
- <sup>12</sup> FP means flashpoint.
- <sup>13</sup> Under the provisions of the IMDG Code, stowage of class 5.2 dangerous goods under deck or in enclosed ro-ro spaces is prohibited.

- <sup>14</sup> Only applicable to dangerous goods evolving flammable vapour listed in the IMDG Code.
- <sup>15</sup> Only applicable to dangerous goods having a flashpoint less than 23°C listed in the IMDG Code.
- <sup>16</sup> Only applicable to dangerous goods having a subsidiary risk class 6.1."
- 3 In paragraph 7.17.1, the words "and excepted quantities" with the following footnote are added after the text "except when carrying dangerous goods in limited quantities":

"Refer to chapter 3.5 of the IMDG Code."

4 The following text is added at the end of the first sentence of paragraph 7.17.3.6.1:

"and shall be selected taking into account the hazards associated with the chemicals being transported and the standards developed by the Organization according to the class and physical state<sup>\*</sup>.

\*\*\*

For solid bulk cargoes, the protective clothing should satisfy the equipment provisions specified in the respective schedules of the IMSBC Code for the individual substances. For packaged goods, the protective clothing should satisfy the equipment provisions specified in emergency procedures (EmS) of the Supplement to the IMDG Code for the individual substances."

#### ANNEX 17

#### RESOLUTION MSC.266(84) (adopted on 13 May 2008)

#### CODE OF SAFETY FOR SPECIAL PURPOSE SHIPS, 2008

#### THE MARITIME SAFETY COMMITTEE,

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

NOTING that specialized types of ships with unusual design and operational characteristics may differ from those of conventional merchant ships subject to the International Convention for the Safety of Life at Sea, 1974 (hereafter referred to as the "1974 SOLAS Convention"),

ALSO NOTING that, by virtue of the specialized nature of the work undertaken by these ships, special personnel are carried, who are neither crew members nor passengers as defined in the 1974 SOLAS Convention,

RECOGNIZING that certain safety standards supplementing those of the 1974 SOLAS Convention may be required for special purpose ships,

NOTING FURTHER that the Assembly, at its thirteenth session, adopted, by resolution A.534(13), the Code of Safety for Special Purpose Ships and authorized the Committee to amend the Code as necessary,

1. ADOPTS the Code of Safety for Special Purpose Ships, 2008 (2008 SPS Code), the text of which is set out in the Annex to the present resolution, as an amendment to the Code adopted by the Assembly by resolution A.534(13);

2. DETERMINES that the 2008 SPS Code supersedes the SPS Code adopted by resolution A.534(13) for special purpose ships certified on or after 13 May 2008;

3. INVITES all Contracting Governments to the 1974 SOLAS Convention to take appropriate steps to give effect to the present Code as soon as possible;

4. REQUESTS the Assembly to endorse the action taken by the Maritime Safety Committee.

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#### ANNEX

#### **CODE OF SAFETY FOR SPECIAL PURPOSE SHIPS, 2008**

#### CONTENTS

Chapter	1	General
Chapter	2	Stability and subdivision
Chapter	3	Machinery installations
Chapter	4	Electrical installations
Chapter	5	Periodically unattended machinery spaces
Chapter	6	Fire protection
Chapter	7	Dangerous goods
Chapter	8	Life-saving appliances
Chapter	9	Radiocommunications
Chapter	10	Safety of navigation
Chapter	11	Security
Annex	Form	of Safety Certificate for Special Purpose Ships

#### PREAMBLE

1 The Maritime Safety Committee, at its eighty-fourth session, revised the Code of Safety for Special Purpose Ships (SPS Code) adopted by resolution A.534(13) to bring it up to date with amendments to SOLAS and to extend the voluntary application of the revised Code to include training ships, whether or not covered by the application requirements of SOLAS.

2 The Code has been developed to provide an international standard of safety for special purpose ships of new construction, the application of which will facilitate operation of such ships and result in a level of safety for the ships and their personnel equivalent to that required by the International Convention for the Safety at Life of Sea, 1974.

3 For the purposes of this Code, a special purpose ship is a ship of not less than 500 gross tonnage which carries more than 12 special personnel, i.e. persons who are specially needed for the particular operational duties of the ship and are carried in addition to those persons required for the normal navigation, engineering and maintenance of the ship or engaged to provide services for the persons carried on board.

4 Because special personnel are expected to be able bodied with a fair knowledge of the layout of the ship and have received some training in safety procedures and the handling of the ship's safety equipment, the special purpose ships on which they are carried need not be considered or treated as passenger ships.

5 In developing the safety standards for this Code it has been necessary to consider:

- .1 the number of special personnel being carried; and
- .2 the design and size of the ship in question.

6 While the Code has been developed for new ships of 500 gross tonnage and above, Administrations may also consider the application of the provisions of the Code to ships of lesser tonnage. The term "new ship" has not been defined in order to give any Administration discretion to decide the effective date of entry into force. 7 For facilitating the operation of special purpose ships, this Code provides for a certificate, called a Special Purpose Ship Safety Certificate, which should be issued to every special purpose ship. Where a special purpose ship is normally engaged on international voyages as defined in SOLAS it should, in addition, also carry SOLAS safety certificates, either:

- .1 for a passenger ship with a SOLAS Exemption Certificate; or
- .2 for a cargo ship with a SOLAS Exemption Certificate, where necessary,

as the Administration deems appropriate.

8 Noting that the Code may be readily applied to some ships that carry special personnel on board to which SOLAS does not apply, the Maritime Safety Committee invites Administrations to apply the standards of the Code to such ships to the extent deemed reasonable and practicable.

## CHAPTER 1

#### GENERAL

1.1 The purpose of the Code is to recommend design criteria, construction standards and other safety measures for special purpose ships.

#### 1.2 **Application**

1.2.1 Except as provided in 8.3, the Code applies to every special purpose ship of not less than 500 gross tonnage certified on or after 13.May 2008. The Administration may also apply these provisions as far as reasonable and practicable to special purpose ships of less than 500 gross tonnage and to special purpose ships constructed before 13 May 2008.

1.2.2 This Code does not apply to ships meeting the Code for the Construction and Equipment of Mobile Offshore Drilling Units (MODU Code).

1.2.3 The Code is not intended for ships used to transport and accommodate industrial personnel that are not working on board.

#### 1.3 **Definitions**

1.3.1 For the purpose of this Code, the definitions given hereunder apply. For terms used, but not defined in this Code, the definitions as given in SOLAS apply.

1.3.2 "Breadth (B)" means the maximum breadth of the ship, measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material. The breadth (B) should be measured in metres.

1.3.3 "Crew" means all persons carried on board the ship to provide navigation and maintenance of the ship, its machinery, systems and arrangements essential for propulsion and safe navigation or to provide services for other persons on board.

1.3.4 "IMDG Code" means the International Maritime Dangerous Goods Code, adopted by the Maritime Safety Committee by resolution MSC.122(75), as amended.

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1.3.5 "Length (L)" means 96% of the total length on a waterline of 85% at the least moulded depth measured from the top of the keel, or the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that be greater. In ships designed with a rake of keel, the waterline on which this length is measured should be parallel to the designed waterline. The length (L) should be measured in metres.

1.3.6 "LSA Code" means the International Life-Saving Appliance Code, adopted by the Maritime Safety Committee by resolution MSC.48(66), as amended.

1.3.7 "Organization" means the International Maritime Organization.

- 1.3.8 "Passenger" means every person other than:
  - .1 the master and the members of the crew or other persons employed or engaged in any capacity on board a ship on the business of that ship; and
  - .2 a child under one year of age.

1.3.9 "Permeability" in relation to a space is the ratio of the volume within that space which is assumed to be occupied by water to the total volume of that space.

1.3.10 "SOLAS" means the International Convention for the Safety of Life at Sea, 1974, as amended.

1.3.11 "Special personnel" means all persons who are not passengers or members of the crew or children of under one year of age and who are carried on board in connection with the special purpose of that ship or because of special work being carried out aboard that ship. Wherever in this Code the number of special personnel appears as a parameter, it should include the number of passengers carried on board which may not exceed 12.

Special personnel are expected to be able bodied with a fair knowledge of the layout of the ship and to have received some training in safety procedures and the handling of the ship's safety equipment before leaving port and include the following:

- .1 scientists, technicians and expeditionaries on ships engaged in research, non-commercial expeditions and survey;
- .2 personnel engaging in training and practical marine experience to develop seafaring skills suitable for a professional career at sea. Such training should be in accordance with a training programme approved by the Administration;
- .3 personnel who process the catch of fish, whales or other living resources of the sea on factory ships not engaged in catching;
- .4 salvage personnel on salvage ships, cable-laying personnel on cable-laying ships, seismic personnel on seismic survey ships, diving personnel on diving support ships, pipe-laying personnel on pipe layers and crane operating personnel on floating cranes; and
- .5 other personnel similar to those referred to in .1 to .4 who, in the opinion of the Administration, may be referred to this group.

1.3.12 "Special purpose ship"<sup>1</sup> means a mechanically self-propelled ship which by reason of its function carries on board more than 12 special personnel<sup>2</sup>.

1.3.13 "Training programme" means a defined course of instruction and practical experience in all aspects of ship operations, similar to the basic safety training as offered by the maritime institutions in the country of the Administration.

## 1.4 **Exemptions**

A ship which is not normally engaged as a special purpose ship and which undertakes an exceptional single voyage as a special purpose ship may be exempted by the Administration from the provisions of this Code, provided that it complies with safety requirements which in the opinion of the Administration are adequate for the voyage which is to be undertaken by the ship.

## 1.5 Equivalents

1.5.1 Where the Code requires that a particular fitting, material, appliance, apparatus, item of equipment or type thereof should be fitted or carried in a unit, or that any particular provision should be made, or any procedure or arrangement should be complied with, the Administration may allow any other fitting, material, appliance, apparatus, item of equipment or type thereof to be fitted or carried, or any other provision, procedure or arrangement to be made in that unit, if it is satisfied by trial thereof or otherwise that such fitting, material, appliance, apparatus, item of equipment or type thereof or that any particular provision, procedure or arrangement is at least as effective as that required by the Code.

1.5.2 When an Administration so allows any fitting, material, appliance, apparatus, item of equipment or type thereof, or provision, procedure, arrangement, novel design or application to be substituted hereafter, it should communicate to the Organization the particulars thereof, together with a report on the evidence submitted, so that the Organization may circulate the same to other Governments for the information of their officers.

#### 1.6 Surveys

Every special purpose ship should be subject to the surveys specified for cargo ships, other than tankers, in SOLAS, which should cover the provisions of this Code.

## 1.7 **Certification**

1.7.1 A certificate may be issued after survey in accordance with 1.6 either by the Administration or by any person or organization duly authorized by it. In every case the Administration assumes full responsibility for the certificate.

1.7.2 The certificate should be drawn up in the official language of the issuing country in a form corresponding to the model given in the annex to the Code. If the language used is neither English nor French, the text should include a translation into one of these languages.

<sup>&</sup>lt;sup>1</sup> Some sail training ships may be classified by the Administration as "not propelled by mechanical means" if fitted with mechanical propulsion for auxiliary and emergency purposes.

<sup>&</sup>lt;sup>2</sup> Where a ship carries more than 12 passengers, as defined in SOLAS, the ship should not be considered a special purpose ship as it is a passenger ship as defined by SOLAS.

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1.7.3 The duration and validity of the certificate should be governed by the respective provisions for cargo ships in SOLAS.

1.7.4 If a certificate is issued for a special purpose ship of less than 500 gross tonnage, this certificate should indicate to what extent relaxations in accordance with 1.2 were accepted.

## **CHAPTER 2**

#### STABILITY AND SUBDIVISION

2.1 The intact stability of special purpose ships should comply with the provisions of section 2.5 of Part B of the 2007 Intact Stability Code.

2.2 The subdivision and damage stability of special purpose ships should in general be in accordance with SOLAS chapter II-1 where the ship is considered a passenger ship, and special personnel are considered passengers, with an R-value calculated in accordance with SOLAS regulation II-1/6.2.3 as follows:

- .1 where the ship is certified to carry 240 persons or more, the R-value is assigned as R;
- .2 where the ship is certified to carry not more than 60 persons, the R-value is assigned as 0.8R; and
- .3 for more than 60 (but not more than 240) persons, the R-value should be determined by linear interpolation between the R-values given in.1 and .2 above.

2.3 For special purpose ships to which 2.2.1 applies, the requirements of SOLAS regulations II-1/8 and II-1/8-1 and of SOLAS chapter II-1, parts B-2, B-3 and B-4 should be applied as though the ship is a passenger ship and the special personnel are passengers. However, SOLAS regulations II-1/14 and II-1/18 are not applicable.

2.4 For special purpose ships to which 2.2.2 or 2.2.3 applies, except as provided in 2.5, the provisions of SOLAS chapter II-1, parts B-2, B-3 and B-4 should be applied as though the ship is a cargo ship and the special personnel are crew. However, SOLAS regulations II-1/8 and II-1/8-1 need not be applied and SOLAS regulations II-1/14 and II-1/18 are not applicable.

2.5 All special purpose ships should comply with SOLAS regulations II-1/9, II-1/13, II-1/19, II-1/20, II-1/21 and II-1/35-1, as though the ship is a passenger ship.

#### CHAPTER 3

#### MACHINERY INSTALLATIONS

3.1 Subject to 3.2, the requirements of part C of chapter II-1 of SOLAS should be met.

#### 3.2 Steering gear

All installations should be in accordance with regulation 29 of part C of chapter II-1 of SOLAS, except that installations in special purpose ships carrying not more than 240 persons on board should, when applicable, be in accordance with regulation 29.6.1.2 and installations in special

purpose ships carrying more than 240 persons on board should, when applicable, be in accordance with regulation 29.6.1.1.

## CHAPTER 4

## ELECTRICAL INSTALLATIONS

4.1 Subject to 4.2 and 4.3, the requirements of part D of chapter II-1 of SOLAS should be met.

#### 4.2 **Emergency source of power**

4.2.1 Installations in special purpose ships carrying not more than 60 persons on board should be in accordance with regulation 43 of part D of chapter II-1 of SOLAS and in addition special purpose ships of more than 50 m in length should meet the requirements of regulation 42.2.6.1 of that part.

4.2.2 Installations in special purpose ships carrying more than 60 persons on board should be in accordance with regulation 42 of part D of chapter II-1 of SOLAS.

## 4.3 **Precautions against shock, fire and other hazards of electrical origin**

4.3.1 All installations should be in accordance with regulation 45.1 to 45.10 inclusive of part D of chapter II-1 of SOLAS.

4.3.2 Installations on special purpose ships carrying more than 60 persons on board should also be in accordance with regulation 45.11 of part D of chapter II-1 of SOLAS.

## CHAPTER 5

#### PERIODICALLY UNATTENDED MACHINERY SPACES

5.1 Subject to 5.2, the requirements of part E of chapter II-1 of SOLAS other than regulation 46, should be met.

#### 5.2 Special purpose ships carrying more than 240 persons on board

Special purpose ships carrying more than 240 persons on board should be specially considered by the Administration as to whether or not their machinery spaces may be periodically unattended, and, if so, whether additional requirements to those stipulated in this chapter are necessary to achieve equivalent safety to that of normally attended machinery spaces.

#### CHAPTER 6

#### **FIRE PROTECTION**

6.1 For ships carrying more than 240 persons on board, the requirements of chapter II-2 of SOLAS for passenger ships carrying more than 36 passengers should be applied.

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6.2 For ships carrying more than 60 (but not more than 240) persons on board, the requirements of chapter II-2 of SOLAS for passenger ships carrying not more than 36 passengers should be applied.

6.3 For ships carrying not more than 60 persons on board, the requirements of chapter II-2 of SOLAS for cargo ships should be applied.

## CHAPTER 7

## **DANGEROUS GOODS**

7.1 Special purpose ships sometimes carry a wide range of dangerous goods classified in accordance with the IMDG Code for use in scientific or survey work or a variety of other applications. These dangerous goods are often carried as ships' stores and are used on board and, therefore, they are not subject to the provisions of the IMDG Code. However, dangerous goods that are carried on board for shipment as cargo and are not used on board, are clearly subject to the provisions of the IMDG Code.

7.2 Notwithstanding the fact that the IMDG Code does not apply to dangerous goods carried as ships' stores and used on board, it contains provisions that are relevant to their safe stowage, handling and carriage on special purpose ships. The IMDG Code also contains requirements for electrical equipment, wiring, fire-fighting equipment, ventilation, smoking provisions and requirements for any special equipment. Some of the provisions are general and apply to all classes of dangerous goods, whilst others are specific, e.g., Class 1 Explosives.

7.3 Therefore, it is important to take into account the appropriate provisions of the IMDG Code when planning to carry dangerous goods, so that the relevant provisions can be taken into account to ensure appropriate construction, loading, stowage, segregation and carriage provisions are put into place.

7.4 Although the IMDG Code does not apply to ships' stores, the master and persons on board the ship responsible for the use of ships' stores should be aware of the provisions of the IMDG Code and should apply them as best practice whenever possible.

7.5 The issues of stowage, personal protection and emergency procedures when dangerous goods are in use, and the subsequent stowage of opened dangerous goods, should be addressed through a formal safety assessment. In addition to the IMDG Code, to carry out such a formal safety assessment, suppliers and safety data sheets for the dangerous goods should also be consulted.

7.6 The provisions of the IMDG Code are based on intact and unopened packaging and the removal of explosive articles or substances from a complete pack may invalidate its IMDG Code classification. This aspect should be taken into account when carrying out the formal safety assessment to ensure an equivalent level of safety is maintained when dangerous goods remain after use.

#### CHAPTER 8

#### LIFE-SAVING APPLIANCES

8.1 The requirements of chapter III of SOLAS should be applied with the specifications given hereunder.

8.2 A special purpose ship carrying more than 60 persons on board should comply with the requirements contained in chapter III of SOLAS for passenger ships engaged in international voyages which are not short international voyages.

8.3 Notwithstanding the provisions of 8.2, a ship carrying more than 60 persons on board may in lieu of meeting the requirements of regulations 21.1.1 of chapter III of SOLAS comply with the requirements of regulation 21.1.5 of chapter III of SOLAS, including the provision of at least two rescue boat(s) in accordance with regulation 21.2.1 of chapter III.

8.4 A special purpose ship carrying not more than 60 persons on board should comply with the requirements contained in chapter III of SOLAS for cargo ships other than tankers. Such ships may, however, carry life-saving appliances in accordance with 8.2, if they comply with the subdivision requirements for ships carrying more than 60 persons.

8.5 Regulations 2, 19.2.3, 21.1.2, 21.1.3, 31.1.6 and 31.1.7 of chapter III of SOLAS and the requirements of paragraphs 4.8 and 4.9 of the LSA Code are not applicable to special purpose ships.

8.6 Where in chapter III of SOLAS the term "passenger" is used, it should be read to mean "special personnel" for the purpose of this Code.

## CHAPTER 9

#### RADIOCOMMUNICATIONS

Notwithstanding the right of the Administration to impose requirements higher than those specified herein, special purpose ships should comply with the requirements for cargo ships of chapter IV of SOLAS.

#### **CHAPTER 10**

#### **SAFETY OF NAVIGATION**

All special purpose ships should comply with the requirements of chapter V of SOLAS.

#### CHAPTER 11

#### **SECURITY**

All special purpose ships should comply with the requirements of chapter XI-2 of SOLAS.

#### ANNEX

## FORM OF SAFETY CERTIFICATE FOR SPECIAL PURPOSE SHIPS

## SPECIAL PURPOSE SHIP SAFETY CERTIFICATE

This Certificate should be supplemented by a Record of Equipment (Form SPS)

(Official seal)

(State)

Issued in compliance with the provisions of the

## CODE OF SAFETY FOR SPECIAL PURPOSE SHIPS, 2008 as adopted by resolution MSC.266(84)

under the authority of the Government of

(name of the State)

by

#### (person or organization authorized)

Particulars of ship <sup>*</sup>
Name of ship
Distinctive number or letters
Port of registry
Gross tonnage
Sea areas in which ship is certificated to operate (SOLAS regulation IV/2)
IMO number
Ship's special purpose
Date on which keel was laid or ship was of a similar stage of construction or, where applicable, date on which work for a conversion or an alteration or modification of a major character was commenced

<sup>\*</sup> Alternatively, the particulars of the ship may be placed horizontally in boxes.

## THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with the provisions of 1.6 of the Code.
- 2 That the survey showed that:
  - 2.1 the ship complied with the provisions of the Code as regards:
    - .1 the structure, main and auxiliary machinery, boilers and other pressure vessels; and
    - .2 the watertight subdivision arrangements and details;

2.2 the ship complied with the provisions of the Code as regards structural fire protection, fire safety systems and appliances and fire control plans;

2.3 the life-saving appliances and the equipment of the lifeboats, liferafts and rescue boats were provided in accordance with the provisions of the Code;

2.4 the ship was provided with a line-throwing appliance and radio installations used in life-saving appliances in accordance with the provisions of the Code;

2.5 the ship complied with the provisions of the Code as regards radio installations;

2.6 the functioning of the radio installations used in life-saving appliances complied with the provisions of the Code;

2.7 the ship complied with the provisions of the Code as regards shipborne navigational equipment, means of embarkation for pilots and nautical publications;

2.8 the ship was provided with lights, shapes, means of making sound signals and distress signals in accordance with the provisions of the Code and the International Regulations for Preventing Collisions of Sea in force;

2.9 in all other respects the ship complied with the relevant provisions of the Code.

3 That an Exemption Certificate has/has not<sup>\*</sup> been issued.

Delete as appropriate.

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4 That the ship has/has not<sup>\*</sup> been provided with certificates issued under SOLAS, as amended.

This certificate is valid until
Completion date of the survey on which this certificate is based (dd/mm/yyyy):
Issued at
(Place of issue of certificate)

(Date of issue)

(Signature of authorized official issuing the certificate)

(Seal or stamp of the issuing authority, as appropriate)

\*

Delete as appropriate.

## ENDORSEMENT FOR ANNUAL SURVEYS RELATING TO HULL, MACHINERY AND EQUIPMENT REFERRED TO IN SECTION 2.1 OF THIS CERTIFICATE

THIS IS TO CERTIFY that, at a survey required by 1.6 of the Code, the ship was found to comply with the relevant provisions of the Code.

Annual survey:		Signed
		Place
		Date
	(Seal or stamp of the Author	ority, as appropriate)
Annual survey:		Signed
		(Signature of authorized official)
		Place
		Date
	(Seal or stamp of the Author	ority, as appropriate)
Annual survey:		Signed
		Place
		Date
	(Seal or stamp of the Authority)	ority, as appropriate)
Annual survey:		Signed
		Place
		Date
	(Seal or stamp of the Author	ority, as appropriate)

## ENDORSEMENT FOR ANNUAL AND PERIODICAL SURVEYS RELATING TO LIFE-SAVING APPLIANCES AND OTHER EQUIPMENT REFERRED TO IN SECTIONS 2.2, 2.3, 2.4, 2.6, 2.7, 2.8 AND 2.9 OF THIS CERTIFICATE

THIS IS TO CERTIFY that, at a survey required by 1.6 of the Code, the ship was found to comply with the relevant provisions of the Code.

Annual survey:	Signed						
	(Signature of authorized official)						
	Place						
	Date						
(Seal or stamp of the Auth	ority, as appropriate)						
Annual/periodical <sup>*</sup> survey:	Signed						
	Place						
	Date						
(Seal or stamp of the Authority, as appropriate)							
Annual/periodical <sup>*</sup> survey:	Signed						
	Place						
	Date						
(Seal or stamp of the Auth	ority, as appropriate)						
Annual survey:	Signed (Signature of authorized official)						
	Place						
	Date						
(Seal or stamp of the Authority, as appropriate)							

<sup>\*</sup> Delete as appropriate.

## ENDORSEMENT FOR PERIODICAL SURVEYS RELATING TO RADIO INSTALLATIONS REFERRED TO IN SECTION 2.5 OF THIS CERTIFICATE

THIS IS TO CERTIFY that, at a survey required by 1.6 of the Code, the ship was found to comply with the relevant provisions of the Code:

Periodical survey:	Signed							
	Place							
	Date							
(Seal or stamp of the Authority, as appropriate)								
Periodical survey:	Signed (Signature of authorized official)							
	Place							
	Date							
(Seal or stamp of the Authority, as appropriate)								
Periodical survey:	Signed							
	Place							
	Date							
(Seal or stamp of the Auth	ority, as appropriate)							
Annual survey:	Signed							
	Place							
	Date							
(Seal or stamp of the Authority, as appropriate)								

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#### ENDORSEMENT FOR THE EXTENSION OF THE CERTIFICATE

The ship complies with the relevant provisions of the Code and this Certificate should, in accordance with 1.7.3, be accepted as valid until .....

Place	
-------	--

Date	
Duit	

(Seal or stamp of the Authority, as appropriate)

#### APPENDIX

# Record of Equipment for the Special Purpose Ship Safety Certificate (Form SPS)

This Record should be permanently attached to the Special Purpose Ship Safety Certificate.

# **RECORD OF EQUIPMENT FOR COMPLIANCE WITH THE CODE OF SAFETY FOR SPECIAL PURPOSE SHIPS**

#### **1 Particulars of ship**

Name of ship
Distinctive number or letters
Number of persons on board (including passengers) for which certified
Minimum number of persons on board with required qualifications to operate the radio installations

## 2 Details of life-saving appliances

1	Total number of persons for which life-saving appliances are provided		
		Port side	Starboard side
2	Total number of lifeboats		
2.1	Total number of persons accommodated by them		
2.2	Number of partially enclosed lifeboats (regulation III/31 and LSA Code, section 4.6)		
22	Number of self righting partially analosed		
2.5	lifeboats (regulation III/31 and LSA Code, section 4.8)		
2.4	(regulation III/31 and LSA Code, section 4.9)		
2.5	Other lifeboats		
2.5.1	Number		
2.5.2	Туре		

Г

3	Number of motor lifeboats (included in the total	
	lifeboats shown above)	
3.1	Number of lifeboats fitted with searchlights	
4	Number of rescue boats	
4.1	Number of boats which are included in the total lifeboats	
	shown above	
5	Liferafts	
5.1	Those for which approved launching appliances are required	
5.1.1	Number of liferafts	
5.1.2	Number of persons accommodated by them	
5.2	Those for which approved launching appliances are not	
	required	
5.2.1	Number of liferafts	
5.2.2	Number of persons accommodated by them	
6	Buoyant apparatus	
6.1	Number of apparatus	
6.2	Number of persons capable of being supported	
7	Number of lifebuoys	
8	Number of lifejackets	
9	Immersion suits	
9.1	Total number	
9.2	Number of suits complying with the requirements for	
	lifejackets	
10	Number of thermal protective aids <sup>*</sup>	
11	Radio installations used in life-saving appliances	
11.1	Number of radar transponders	
11.2	Number of two-way VHF radiotelephone apparatus	

Т

<sup>\*</sup> Excluding those required by the LSA Code, paragraphs 4.1.5.1.24, 4.4.8.31 and 5.1.2.2.13.

# **3** Details of radio facilities

	Item	Actual provision
		•
1	Primary systems	
1.1	VHF radio installation	
1.1.1	DSC encoder	
1.1.2	DSC watch receiver	
1.1.3	Radiotelephony	
1.2	MF radio installation	
1.2.1	DSC encoder	
1.2.2	DSC watch receiver	
1.2.3	Radiotelephony	
1.3	MF/HF radio installation	
1.3.1	DSC encoder	
1.3.2	DSC watch receiver	
1.3.3	Radiotelephony	
1.3.4	Direct-printing radiotelegraphy	
1.4	Inmarsat ship earth station	
2	Secondary means of alerting	
3	Facilities for reception of maritime safety information	
3.1	NAVTEX receiver	
3.2	EGC receiver	
3.3	HF direct-printing radiotelegraph receiver	
4	Satellite EPIRB	
4.1	COSPAS-SARSAT	
4.2	Inmarsat	
5	VHFEPIRB	
6	Ship's radar transponder	

# 4 Methods used to ensure availability of radio facilities (SOLAS regulations IV/15.6 and 15.7)

4.1	Duplication of equipment
4.2	Shore-based maintenance
4.3	Of-sea maintenance capability
# 5 Details of navigational systems and equipment

Item

nem	
1.1	Standard magnetic compass <sup>*</sup>
1.2	Spare magnetic compass <sup>*</sup>
1.3	Gyro compass <sup>*</sup>
1.4	Gyro compass heading repeater <sup>*</sup>
1.5	Gyro compass bearing repeater <sup>*</sup>
1.6	Heading or track control system <sup>*</sup>
1.7	Pelorus or compass bearing device <sup>*</sup>
1.8	Means of correcting heading and bearings
1.9	Transmitting heading device (THD) <sup>*</sup>
2.1	Nautical charts/Electronic chart display and information system (ECDIS)**
2.2	Back up arrangements for ECDIS
2.3	Nautical publications
2.4	Back up arrangements for electronic nautical publications
3.1	Receiver for a global navigation satellite system/terrestrial radionavigation
	system <sup>*</sup> , **
3.2	9 GHz radar <sup>*</sup>
3.3	Second radar (3 GHz/ 9 GHZ <sup>**</sup> ) <sup>*</sup>
3.4	Automatic radar plotting aid (ARPA) <sup>*</sup>
3.5	Automatic tracking aid <sup>*</sup>
3.6	Second automatic tracking aid <sup>*</sup>
3.7	Electronic plotting aid <sup>*</sup>
4	Automatic identification system (AIS)
5.1	Voyage data recorder (VDR) <sup>**</sup>
5.2	Simplified voyage data recorder (S-VDR) <sup>**</sup>
6.1	Speed and distance measuring device (through the water) <sup>*</sup>
6.2	Speed and distance measuring device (over the ground in the forward and
	athwartship direction) <sup>*</sup>
6.3	Echo sounding device <sup>*</sup>
7.1	Rudder, propeller, thrust, pitch and operational mode indicator <sup>*</sup>
7.2	Rate of turn indicator <sup>*</sup>
8	Sound reception system <sup>*</sup>
9	Telephone to emergency steering position <sup>*</sup>
10	Davlight signalling lamp <sup>*</sup>
11	Radar reflector <sup>*</sup>
12	International Code of Signals
13	IAMSAR Manual, Volume III

\*\* Delete as appropriate.

<sup>\*</sup> Alternative means of meeting this requirement are permitted under regulation V/19. In case of other means, they should be specified.

THIS IS TO CERTIFY that this Record is correct in all respects.

(Date of issue)

.....

(Signature of duly authorized official issuing the Record)

(Seal or stamp of the issuing authority, as appropriate)

\*\*\*

#### ANNEX 18

#### DRAFT AMENDMENTS TO THE LSA CODE

# CHAPTER IV SURVIVAL CRAFT

#### 4.4 General requirements for lifeboats

1 In subparagraph .1 of paragraph 4.4.2.2, the words "(for a lifeboat intended for a passenger ship) or 82.5 kg (for a lifeboat intended for a cargo ship)" are inserted after the words "75 kg".

2 The existing paragraph 4.4.9.1 is replaced by the following:

"4.4.9.1 The number(s) of persons for which the lifeboat is approved, for passenger ships and/or cargo ships, as applicable, shall be clearly marked on it in clear permanent characters."

#### 4.7 Free-fall lifeboats

3 The existing paragraph 4.7.2 is replaced by the following:

"4.7.2 Carrying capacity of a free-fall lifeboat

4.7.2.1 The carrying capacity of a free-fall lifeboat is the number of persons having an average mass of 82.5 kg that can be provided with a seat without interfering with the means of propulsion or the operation of any of the lifeboat's equipment. The seating surface shall be smooth and shaped and provided with cushioning of at least 10 mm over all contact areas to provide support for the back and pelvis and flexible lateral side support for the head. The seats shall be of the non-folding type, permanently secured to the lifeboat and arranged so that any deflection of the hull or canopy during launching will not cause injury to the occupants. The location and structure of the seat shall be arranged to preclude the potential for injury during launch if the seat is narrower than the occupant's shoulders. The passage between the seats shall have a clear width of at least 480 mm from the deck to the top of the seats, be free of any obstruction and provided with an anti-slip surface with suitable foot holds to allow safe embarkation in the ready-to-launch position. Each seat shall be provided with a suitable locking harness capable of quick release under tension to restrain the body of the occupant during launching.

4.7.2.2 The angle between the seat pan and the seat back shall be at least  $90^{\circ}$ . The width of the seat pan shall be at least 480 mm. Free clearance in front of the backrest (buttock to knee length) shall be at least 650 mm measured at an angle of  $90^{\circ}$  to the backrest. The backrest shall extend at least 1,075 mm above the seat pan. The seat shall provide for shoulder height, measured along the seat back, of at least 760 mm. The foot rest shall be oriented at not less than half of the angle of the seat pan and shall have a foot length of at least 330 mm. Figure 2 refers.



# Figure 2"

## CHAPTER V RESCUE BOATS

### 5.1 Rescue boats

4 In the first sentence of paragraph 5.1.1.1, the words ", except that, for all rescue boats, an average mass of 82.5 kg shall apply to paragraph 4.4.2.2.1" are added after the reference to "4.4.9".

5 In the second sentence of paragraph 5.1.3.5, the words "75 kg" are replaced by the words "82.5 kg".

#### ANNEX 19

#### **DRAFT MSC RESOLUTION**

#### ADOPTION OF AMENDMENTS TO THE REVISED RECOMMENDATION ON TESTING OF LIFE-SAVING APPLIANCES (RESOLUTION MSC.81(70))

#### 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.689(17) on Testing of life-saving appliances, by which the Assembly, at its seventeenth session, adopted recommendations for test requirements for life-saving appliances,

RECALLING FURTHER that the Assembly, when adopting resolution A.689(17), authorized the Committee to keep the Recommendation on testing of life-saving appliances under review and to adopt, when appropriate, amendments thereto,

NOTING resolution MSC.81(70), by which, at its seventieth session, it adopted the Revised recommendation on testing of life-saving appliances, recognizing the need to introduce more precise provisions for the testing of life-saving appliances based on the requirements of the International Life-Saving Appliances (LSA) Code,

BEING DESIROUS to address increases in the size of mariners by increasing the assumed weight of persons in lifeboats and rescue boats, and to address potential injury by flexing of hulls and canopies of free-fall lifeboats during launch,

HAVING CONSIDERED, at its [.....] session, amendments to the Revised recommendation on testing of life-saving appliances, proposed by the Sub-Committee on Ship Design and Equipment at its fifty-first session,

1. ADOPTS amendments to the Revised recommendation on testing of life-saving appliances (resolution MSC.81(70)), the text of which is set out in the Annex to the present resolution;

2. **RECOMMENDS** Governments to apply the annexed amendments when testing life-saving appliances.

## ANNEX

# AMENDMENTS TO THE REVISED RECOMMENDATION ON TESTING OF LIFE-SAVING APPLIANCES (RESOLUTION MSC.81(70))

# PART 1

# PROTOTYPE TESTS FOR LIFE-SAVING APPLIANCES

# 6.1 Definitions and general conditions

1 The existing paragraph 6.1.1 is replaced by the following:

"6.1.1 Except as specified otherwise, the mass of an average person as used herein should be taken to be 75 kg for a lifeboat intended for a passenger ship, or 82.5 kg for a lifeboat intended for a cargo ship."

# 6.3 Lifeboat overload test

2 In the first sentence of paragraph 6.3.2, after the word "persons", the words "for the type of ship" are inserted.

3 The existing paragraph 6.3.9 is replaced by the following:

"6.3.9 This test should be considered successful if the lifeboat passes the operational test to the satisfaction of the Administration; no damage has been sustained that would affect the lifeboat's efficient functioning; and any deflections of the hull or canopy as measured during the test would not cause injury to lifeboat occupants."

## 6.7 Lifeboat seating space test

4 In the second sentence of paragraph 6.7.1, after the words "75 kg", the words "for a lifeboat intended for a passenger ship or 82.5 kg for a lifeboat intended for a cargo ship," are inserted.

## 7.1 **Rigid rescue boats**

5 In the second sentence of paragraph 7.1.3, the words "75 kg" are replaced by the words "82.5 kg".

6 In the first sentence of paragraph 7.1.4, after the word "persons", the words ", each weighing 82.5 kg," are inserted.

# 7.2 Inflated rescue boats

7 In subparagraph .3 of paragraph 7.2.4, the words "75 kg" are replaced by the words "82.5 kg".

8 In the first sentence of paragraph 7.2.11, after the word "persons", the words ", each weighing 82.5 kg," are inserted.

# PART 2

# PRODUCTION AND INSTALLATION TESTS

# 5.2 Davit-launched liferaft and inflated rescue boat test

9 In subparagraph .4 of paragraph 5.2, after the words "75 kg per person", the words "for the liferaft and 82.5 kg per person for the rescue boat" are inserted.

## 6.1 Launching appliances using falls and winches

10 In the first sentence of paragraph 6.1.2, after the words "75 kg", the words "or 82.5 kg, as applicable" are inserted.

11 In the first sentence of paragraph 6.1.5, after the words "75 kg", the words "or 82.5 kg, as applicable" are inserted.

\*\*\*

## ANNEX 20

# DRAFT AMENDMENTS TO THE INTERNATIONAL SAFETY MANAGEMENT (ISM) CODE

#### 1 GENERAL

#### **1.1 Definitions**

1 In paragraph 1.1.10 the words "and includes" are replaced by the word "or".

#### 1.2 Objectives

- 2 The existing paragraph 1.2.2.2 is replaced by the following:
  - ".2 assess all identified risks to its ships, personnel and the environment and establish appropriate safeguards; and"

## 5 MASTER'S RESPONSIBILITY AND AUTHORITY

3 The word "periodically" is added at the beginning of paragraph 5.1.5.

## 7 DEVELOPMENT OF PLANS FOR SHIPBOARD OPERATIONS

4 The existing section 7 is replaced by the following:

#### **"7 SHIPBOARD OPERATIONS**

The Company should establish procedures, plans and instructions, including checklists as appropriate, for key shipboard operations concerning the safety of the personnel, ship and protection of the environment. The various tasks should be defined and assigned to qualified personnel."

## 8 EMERGENCY PREPAREDNESS

5 The existing paragraph 8.1 is replaced by the following:

"8.1 The Company should identify potential emergency shipboard situations, and establish procedures to respond to them."

# 9 **REPORTS AND ANALYSIS OF NON-CONFORMITIES, ACCIDENTS AND HAZARDOUS OCCURRENCES**

6 The existing paragraph 9.2 is replaced by the following:

"9.2 The Company should establish procedures for the implementation of corrective action, including measures intended to prevent recurrence."

# 10 MAINTENANCE OF THE SHIP AND EQUIPMENT

7 In paragraph 10.3, the words "establish procedures in its safety management system to" are deleted.

# 12 COMPANY VERIFICATION, REVIEW AND EVALUATION

8 In paragraph 12.1 the words "[on board and ashore at least annually]" are inserted after the words "internal audits".

9 In paragraph 12.2 the words "efficiency of and, when needed, review" are replaced by the words "effectiveness of".

# 13 CERTIFICATION AND PERIODICALLY VERIFICATION

10 The following new paragraphs 13.12, 13.13 and 13.14 are added after the existing paragraph 13.11:

"13.12 When the renewal verification is completed after the expiry date of the existing Safety Management Certificate, the new Safety Management Certificate shall be valid from the date of completion of the renewal verification to a date not exceeding five years from the date of expiry of the existing Safety Management Certificate.

13.13 If a renewal verification has been completed and a new Safety Management Certificate cannot be issued or placed on board the ship before the expiry date of the existing certificate, the Administration or organization recognized by the Administration may endorse the existing certificate and such a certificate shall be accepted as valid for a further period which shall not exceed five months from the expiry date.

13.14 If a ship at the time when a Safety Management Certificate expires is not in a port in which it is to be verified, the Administration may extend the period of validity of the Safety Management Certificate but this extension shall be granted only for the purpose of allowing the ship to complete its voyage to the port in which it is to be verified, and then only in cases where it appears proper and reasonable to do so. No Safety Management Certificate shall be extended for a period of longer than three months, and the ship to which an extension is granted shall not, on its arrival in the port in which it is to be verified, be entitled by virtue of such extension to leave that port without having a new Safety Management Certificate. When the renewal verification is completed, the new Safety Management Certificate shall be valid to a date not exceeding five years from the expiry date of the existing Safety Management Certificate before the extension was granted."

# 14 INTERIM CERTIFICATION

11 In paragraph 14.4.3 the word "internal" is inserted after the words "planned the".

#### APPENDIX

# Forms of the Document of Compliance, the Safety Management Certificate, the Interim Document of Compliance and the Interim Safety Management Certificate

## SAFETY MANAGEMENT CERTIFICATE

12 The following new form is added after existing form of "ENDORSEMENT FOR INTERMEDIATE VERIFICATION AND ADDITIONAL VERIFICATION (IF REQUIRED)":

#### "Certificate No.

## ENDORSEMENT WHERE THE RENEWAL VERIFICATION HAS BEEN COMPLETED AND PART B 13.13 OF THE ISM CODE APPLIES

The ship complies with the relevant provisions of part B of the ISM Code, and the Certificate shall, in accordance with part B 13.13 of the ISM Code, be accepted as valid until.....

Signed
(Signature of authorized official)
Place
Date

(Seal or stamp of the authority, as appropriate)

## ENDORSEMENT TO EXTEND THE VALIDITY OF THE CERTIFICATE UNTIL REACHING THE PORT OF VERIFICATION WHERE PART B 13.12 OF THE ISM CODE APPLIES OR FOR A PERIOD OF GRACE WHERE PART B 13.14 OF THE ISM CODE APPLIES

This Certificate shall, in accordance with part B 13.12 or part B 13.14 of the ISM Code, be accepted as valid until .....

Signed
(Signature of authorized official)
Place
Date

(Seal or stamp of the authority, as appropriate)"

\*\*\*

# ANNEX 21

#### WORK PROGRAMMES OF THE SUB-COMMITTEES

# SUB-COMMITTEE ON BULK LIQUIDS AND GASES (BLG)

		Target completion date/number of sessions needed for completion	Reference
1	<b>Evaluation of safety and pollution</b> hazards of chemicals and preparation of consequential amendments Strategic direction: 7.2 and 1.3 High-level action: 7.2.2 and 1.3.3 Planned output: 7.2.2.1 and 1.3.3.1	Continuous	BLG 10/19, section 3; BLG 11/16, section 3
2	Casualty analysis (coordinated by FSI) Strategic direction: 12.1 High-level action: 12.1.2 Planned output: 12.1.2.1 to .2	Continuous	MSC 70/23, paragraphs 9.17 and 20.4; MSC 80/24, paragraph 21.6; BLG 12/17, section 9
3	Consideration of IACS unified interpretations Strategic direction: 1.1 High-level action: 1.1.2 Planned output: 1.1.2.1	Continuous	MSC 78/26, paragraph 22.12; BLG 12/17, section 10
H.1	Environmental and safety aspects of alternative tanker designs under MARPOL, Annex I, regulation 19 <i>Strategic direction:</i> 7.2 <i>High-level action:</i> 7.2.2 <i>Planned output:</i> 7.2.2.1		BLG 3/18, paragraph 15.7
	.1 assessment of alternative tanker designs, if any (as necessary)	Continuous	BLG 1/20, section 16; BLG 4/18, paragraph 15.3

**Notes:** 1 "H" means a high priority item and "L" means a low priority item. However, within the high and low priority groups, items have not been listed in any order of priority.

<sup>2</sup> Items printed in bold letters have been selected for the provisional agenda for BLG 13.

# Sub-Committee on Bulk Liquids and Gases (BLG) (continued)

		Target completion date/number of sessions needed for completion	Reference
H.2	Development of provisions for gas-fuelled ships (in cooperation with FP and DE) Strategic direction: 5.2 High-level action: 5.2.1 Planned output: 5.2.1.1	2009	MSC 78/26, paragraph 24.11; BLG 12/17, section 7
Н.3	Development of guidelines and other documents for uniform implementation of the 2004 BWM Convention Strategic direction: 7.1 High-level action: 7.1.2 Planned output: 7.1.2.2 to .5	2010	MEPC 52/24, paragraph 2.21.6; BLG 12/17, section 5
H.4	Application of the requirements for the carriage of bio-fuels and bio-fuel blends Strategic direction: 7.2 High-level action: 7.2.2 Planned output: 7.2.2.1	2009	MEPC 55/23, paragraphs 19.4 and 19.5; BLG 12/17, section 4
H.5	<b>Development of international measures for minimizing the transfer of invasive aquatic species through bio-fouling of ships</b> <i>Strategic direction: 7.1</i> <i>High-level action: 7.1.1</i> <i>Planned output: -</i>	2010	MEPC 56/23, paragraph 19.12; BLG 12/17, section 11
H.6	Review of the Recommendation for material safety data sheets for MARPOL Annex I cargoes and marine fuel oils Strategic direction: 5.2 High-level action: 5.2.3 Planned output: 5.2.3.1	2009	BLG 11/16, paragraph 14.14; MSC 83/28, paragraph 25.8; BLG 12/17, section 12

# Sub-Committee on Bulk Liquids and Gases (BLG) (continued)

		Target completion date/number of sessions needed for completion	Reference
H.7	<b>Revision of the IGC Code</b> (in cooperation with FP, DE, SLF and STW as necessary) <i>Strategic direction:</i> 5.2 <i>High-level action:</i> 5.2.1 <i>Planned output:</i> -	2010	MSC 83/28, paragraph 25.7; BLG 12/17, section 13
H.8	Safety requirements for natural gas hydrate pellet carriers Strategic direction: 5.2 High-level action: 5.2.1 Planned output: -	2011	MSC 83/28, paragraph 25.6
H.9	Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NOx Technical Code Strategic direction: 7.3 High-level action: 7.3.1 Planned output: 7.3.1.1	2010	BLG 12/17, paragraph 6.88.9
H.10	Amendments to MARPOL Annex I on the use and carriage of heavy grade oil on ships in the Antarctic area Strategic direction: 7.2 High-level action: 7.2.2 Planned output: -	2010	BLG 12/17, paragraph 16.12

# SUB-COMMITTEE ON DANGEROUS GOODS, SOLID CARGOES AND CONTAINERS (DSC)

		Target completion date/number of sessions needed for completion	Reference
1	Harmonization of the IMDG Code with the UN Recommendations on the Transport of Dangerous Goods Strategic direction: 1.3 High-level action: 1.3.5 Planned output: 1.3.5.1	Continuous	MSC 63/23, paragraph 10.6
2	Reports on incidents involving dangerous goods or marine pollutants in packaged form on board ships or in port areas Strategic direction: 12.3 High-level action: 12.3.1 Planned output: -	Continuous	CDG 45/22, section 11 and paragraph 20.2; DSC 11/19, section 6
3	Amendments to the BC Code,including evaluation of properties ofsolid bulk cargoesStrategic direction: 5.2High-level action: 5.2.3Planned output: 5.2.3.1	Continuous	BC 34/17, section 3; DSC 11/19, section 4
4	Casualty analysis (coordinated by FSI) Strategic direction: 12.1 High-level action: 12.1.2 Planned output: 12.1.2.1 to .2	Continuous	MSC 70/23, paragraphs 9.17 and 20.4; DSC 11/19, section 6
H.1	Amendment (35-10) to the IMDG Codeand supplementsStrategic direction:5.2High-level action:5.2.3Planned output:5.2.3.1	2009	DSC 3/15, paragraph 12.6; DSC 12/19, section 3
H.2	Amendments to the CSS CodeStrategic direction:5.2High-level action:5.2.3Planned output:5.2.3.1	2008	MSC 78/26, paragraph 24.15.3; DSC 12/19, section 8

Notes:

<sup>1 &</sup>quot;H" means high priority item and "L" means a low priority item. However, within the high and low priority groups, items have not been listed in any order of priority.

<sup>2</sup> Items printed in **bold** letters have been selected for the provisional agenda for DSC 13.

Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC) (continued)

		Target completion date/number of sessions needed for completion	Reference
Н.3	<b>Extension of the BLU Code to include</b> grain Strategic direction: 5.2 High-level action: 5.2.3 Planned output: -	2008	MSC 79/23, paragraph 20.7; DSC 11/19, section 12
H.4	Guidance on providing safe working conditions for securing of containers Strategic direction: 5.2 High-level action: 5.2.3 Planned output: 5.2.3.2	2008	MSC 80/24, paragraph 21.8; DSC 12/19, section 10
H.5	Review of the Recommendations on the safe use of pesticides in ships Strategic direction: 5.2 High-level action: 5.2.3 Planned output: 5.2.3.2	2008	DSC 10/17, paragraph 4.23; DSC 12/19, section 11
H.6	Guidance on protective clothing Strategic direction: 5.2 High-level action: 5.2.3 Planned output: 5.2.3.2	2008	MSC 81/25, paragraph 23.8; DSC 11/19, paragraph 16.1.3.1
H.7	<b>Revision of the Code of Safe Practice for Ships Carrying Timber Deck Cargoes</b> <i>Strategic direction: 5.2</i> <i>High-level action: -</i> <i>Planned output: -</i>	2010	MSC 82/24, paragraph 21.11
H.8	Form and procedure for approval of the Cargo Securing Manual Strategic direction: 5.2 High-level action: 5.2.3 Planned output: 5.2.3.2	2008	MSC 82/24, paragraph 21.12
H.9	Stowage of water-reactive materials (in cooperation with FP as necessary) Strategic direction: 5.2 High-level action: 5.2.3 Planned output: -	2009	MSC 83/28, paragraph 25.12

# Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC) (continued)

		Target completion date/number of sessions needed for completion	Reference
H.10	Amendments to the International	2009	DSC 12/19, section 16;
	Convention for Safe Containers, 1972 Strategic direction: 5.2 High-level action: 5.2.3 Planned output: 5.2.3.1		MSC 83/28, paragraph 25.13.1
H.11	Review of the Guidelines for packing of cargo transport units Strategic direction: 5.2 High-level action: 5.2.3 Planned output: 5.2.3.2	2009	DSC 12/19, section 16; MSC 83/28, paragraph 25.13.2
L.1	Review of documentation requirements for dangerous goods in packaged form Strategic direction: 5.2 High-level action: 5.2.3 Planned output: -	2009	MSC 84/24, paragraph 22.9
L.2	Consideration for the efficacy of Container Inspection Programme Strategic direction: 5.2 High-level action: 5.2.3 Planned output: -	2 sessions	MSC 84/24, paragraph 22.10

# SUB-COMMITTEE ON FIRE PROTECTION (FP)

			Target completion date/number of sessions needed for completion	Reference
1	Analysis of fire casualty recoStrategic direction:12High-level action:12Planned output:12	ords 2.1 2.1.2 2.1.2.1 to .2	Continuous	MSC 75/24, paragraph 22.18; FP 52/21, section 15
2	Consideration of IACS unifiinterpretationsStrategic direction:1.High-level action:Planned output:1.	ed 1 1.2 1.2.1	Continuous	MSC 78/26, paragraph 22.12; FP 52/21, section 12
H.1	Performance testing and approximate testing approx	proval ems .1.1 .1.1.2	2009	MSC 74/24, paragraph 21.12; FP 52/21, section 3
H.2	Comprehensive review on the Procedures CodeStrategic direction:2High-level action:2Planned output:2	ne Fire Test .1.1 .1.1.1	2009	MSC 80/24, paragraph 21.11; FP 52/21, section 4
H.3	Development of provisions for gas-fuelled ships (coordinated Strategic direction:Strategic direction:5.High-level action:5.Planned output:5.	or 1 by BLG) 2 2.1 2.1.1	2009	MSC 78/26, paragraph 24.19; FP 52/21, section 11
H.4	Measures to prevent fires in engine-rooms and cargo pun Strategic direction:Strategic direction:2High-level action:2Planned output:2	np-rooms .1.1 .1.1.2	2009	MSC 79/23, paragraph 20.11; FP 52/21, section 6

**Notes:** 1 "H" means a high priority item and "L" means a low priority item. However, within the high and low priority groups, items have not been listed in any order of priority.

2 Items printed in **bold** letters have been selected for the provisional agenda for FP 53.

# Sub-Committee on Fire Protection (FP) (continued)

		Target completion date/number of sessions needed for completion	Reference
H.5	Fire resistance of ventilation ductsStrategic direction:5.2High-level action:5.2.1Planned output:5.2.1.1	2009	MSC 81/25, paragraph 23.13; MSC 83/28, paragraph 25.22
H.6	Fixed hydrocarbon gas detectionsystems on double-hull oil tankers(in cooperation with BLG as necessarStrategic direction:2High-level action:2High-level action:2.1.1Planned output:2.1.1.1	2010 ry)	MSC 82/24, paragraph 21.18; FP 52/21, section 13; MSC 84/24, paragraph 22.16
H.7	Clarification of SOLAS chapter II- requirements regarding interrelation between central control station and safety centre Strategic direction: 2 High-level action: 2.1.1 Planned output: 2.1.1.2	-2 2009 on 1	MSC 82/24, paragraph 21.20; FP 52/21, section 14
H.8	Harmonization of the requirement the location of entrances, air inlets openings in the superstructures of tankers (in cooperation with BLG as necessary) Strategic direction: 5.2 High-level action: 5.2.1 Planned output: -	s for 2010 and	MSC 83/28, paragraph 25.24.2; FP 52/21, paragraph 16.1
H.9	Amendments to SOLAS chapter IIrelated to the releasing controls anmeans of escape for spaces protectsfixed carbon dioxide systemsStrategic direction:5.2High-level action:5.2.1Planned output:-	<b>I-2</b> 2010 d ed by	MSC 83/28, paragraph 25.24.1; FP 52/21, paragraph 16.1

# Sub-Committee on Fire Protection (FP) (continued)

		Target completion date/number of sessions needed for completion	Reference
H.10	Guidelines for drainage systems in closed vehicle and ro-ro spaces and special category spaces (in cooperation with SLF)Strategic direction:5.1High-level action:5.1.1Planned output:5.1.1.2	2009	MSC 83/28, paragraph 25.20; FP 52/21, paragraph 18.5
H.11	Review of fire protection requirementsfor on-deck cargo areas(in cooperation)of DSC as necessary)Strategic direction:5.1High-level action:5.1.1Planned output:-	2011	MSC 83/28, paragraph 25.21; FP 52/21, paragraph 16.1
H.12	Means of escape from machinery spacesStrategic direction:5.2High-level action:5.2.1Planned output:-	2010	MSC 83/28, paragraph 25.23; FP 52/21, paragraph 16.1
H.13	Measures to prevent explosions on oil and chemical tankers transporting low-flash point cargoes (in cooperation with BLG and DE as necessary)Strategic direction:5.2High-level action:5.2.3Planned output:5.2.3.4	2009	FP 51/19, paragraph 10.8; MSC 83/28, paragraph 9.26; FP 52/21, section 20
H.14	Recommendation on evacuationanalysis for new and existing passengershipsStrategic direction:5.1High-level action:5.1.1Planned output:5.1.1.1	2010	MSC 73/21, paragraph 4.16; MSC 83/28, paragraph 8.7 ; FP 52/21, section 19

# Sub-Committee on Fire Protection (FP) (continued)

		Target completion date/number of sessions needed for completion	Reference
H.15	Explanatory notes for the application of the safe return to port requirements (in cooperation with DE and SLF as necessary)Strategic direction:5.1High-level action:5.1.1Planned output:-	2010	MSC 84/24, paragraph 22.15
H.16	Safety provisions applicable to tenders operating from passenger ships (coordinated by DE) Strategic direction: 5.2 High-level action: 5.2.1 Planned output: -	3 sessions	MSC 84/24, paragraph 22.14
L.1	Smoke control and ventilationStrategic direction:5.2High-level action:5.2.1Planned output:-	2 sessions	FP 39/19, section 9; FP 46/16, section 4

# SUB-COMMITTEE ON FLAG STATE IMPLEMENTATION (FSI)

		Target completion date/number of sessions needed for completion	Reference
1	Mandatory reports underMARPOL 73/78Strategic direction:2.1High-level action:2.1.1Planned output:2.1.1.6	Continuous	MSC 70/23, paragraph 20.12.1; FSI 15/18, section 4
2	Casualty statistics and investigations12.1Strategic direction:12.1.2High-level action:12.1.2Planned output:12.1.2.1 to .2	Continuous	MSC 68/23, paragraphs 7.16 to 7.24; FSI 15/18, section 6
3	Harmonization of port Statecontrol activitiesStrategic direction:5.3High-level action:5.3.1Planned output:-	Continuous	MSC 71/23, paragraph 20.16; MSC 80/24, paragraph 21.16; FSI 15/18, section 7
4	Responsibilities of Governmentsand measures to encourage flagState complianceStrategic direction:Strategic direction:5.3High-level action:5.3.1Planned output:-	Continuous	MSC 68/23, paragraphs 7.2 to 7.8; FSI 15/18, section 3
5	Comprehensive analysis of difficulties encountered in the implementation of IMO instruments Strategic direction: 2.1 High-level action: 2.1.1 Planned output: -	Continuous	MSC 69/22, paragraph 20.28; FSI 8/19, paragraph 4.3; FSI 15/18, section 11

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<sup>2</sup> Items printed in **bold** letters have been selected for the provisional agenda for FSI 16.

# Sub-Committee on Flag State Implementation (FSI) (continued)

			Target completion date/number of sessions needed for completion	Reference
6	Review of the Survey G under the HSSC (resolution A.948(23)) Strategic direction: High-level action: Planned output:	5.2 5.2.1 5.2.1.2	Continuous	MSC 72/23, paragraph 21.27; FSI 15/18, section 12
7	<b>Consideration of IACS</b> <b>interpretations</b> Strategic direction: High-level action: Planned output:	unified 1.1 1.1.2 1.1.2.1	Continuous	MSC 78/26, paragraph 22.12; FSI 15/18, section 13
8	Review of the Code for Implementation of Mar Instruments Strategic direction: High-level action: Planned output:	the datory IMO 2.2 2.2.1 2.2.1.2	Continuous	MSC 83/28, paragraph 15.3
H.1	PSC guidelines on seafar hours Strategic direction: High-level action: Planned output:	rers' working 1.1 1.1.2 1.1.2.1	2009	MSC 70/23, paragraph 20.12.3; FSI 15/18, paragraph 10.5
H.2	Illegal, unregulated and (IUU) fishing and imple resolution A.925(22) Strategic direction: High-level action: Planned output:	l unreported ementation of 1.1 1.1.2 -	2008	MSC 72/23, paragraph 21.28; FSI 10/17, section 11; MSC 75/24, paragraphs 13.11 and 22.25.3; FSI 15/18, section 14
Н.3	Development of guideli State control under the Convention Strategic direction: High-level action: Planned output:	nes on port 2004 BWM 5.3 5.3.1	2008	MEPC 52/24, paragraph 2.21.2; FSI 15/18, section 9

# Sub-Committee on Flag State Implementation (FSI) (continued)

			Target completion date/number of sessions needed for completion	Reference
H.4	Port reception facilities	s-related issues	2010	MEPC 53/24,
	Strategic direction:	1.1		paragraph 9.7;
	High-level action:	1.1.2		FSI 15/18, section 5
	Planned output:	-		
H.5	Code of conduct during campaigns against ships (coordinated by NAV)	demonstrations/ on high seas	2 sessions	MSC 82/24, paragraph 21.26
	Strategic direction:	5.2		
	High-level action:	5.2.4		
	Planned output:	5.2.4.2		
H.6	Measures to protect the spersons rescued at sea	safety of	2 sessions*	MSC 84/24, paragraph 22.19
	<i>Strategic direction:</i>	5.1		
	High-level action:	5.1.2		
	Planned output:	-		
H.7	Development of a Code Organizations	for Recognized	2 sessions*	MSC 84/24, paragraphs 22.25
	Strategic direction:	1.1		and 22.36
	High-level action:	1.1.2		
	Planned output:	-		

<sup>\*</sup> The Sub-Committee has been instructed to include the item in the provisional agenda for FSI 17.

# SUB-COMMITTEE ON RADIOCOMMUNICATIONS AND SEARCH AND RESCUE (COMSAR)

		Target completion date/number of sessions needed for completion	Reference
1	Global Maritime Distress and Safety System (GMDSS)		
	.1 matters relating to the GMDSS Master Plan Strategic direction: 5.2 High-level action: 5.2.5 Planned output: 5.2.5.2	Continuous	COMSAR 12/15, paragraphs 3.1 to 3.7 and 3.23 to 3.30
2	Promulgation of maritime safety information (MSI) (in cooperation with ITU, IHO, WMO and IMSO)		
	.1operational coordination provisions maritime safety information (MSI) services, including review of the related documents Strategic direction: 5.2 High-level action: 5.2.5 Planned output: 5.2.5.1	Continuous	COMSAR 12/15, paragraphs 3.1 to 3.7 and 3.23 to 3.30
3	ITU World RadiocommunicationConference mattersStrategic direction:1.1High-level action:1.1.2Planned output:1.1.2.2	Continuous	COMSAR 12/15, paragraphs 4.11 to 4.19 and 4.28 to 4.35
4	RadiocommunicationITU-RStudyGroup mattersStrategic direction:1.1High-level action:1.1.2Planned output:1.1.2.2	Continuous	COMSAR 12/15, paragraphs 4.1 to 4.10 and 4.22 to 4.27

Notes:

1

<sup>&</sup>quot;H" means a high priority item and "L" means a low priority item. However, within the high and low priority groups, items have not been listed in any order of priority.

<sup>2</sup> Items printed in bold letters have been selected for the provisional agenda for COMSAR 13.

# Sub-Committee on Radiocommunications and Search and Rescue (COMSAR) (continued)

		Target completion date/number of sessions needed for completion	Reference
5	Satellite services (Inmarsat and COSPAS-SARSAT) Strategic direction: 5.2 High-level action: 5.2.5 Planned output: 5.2.5.4	Continuous	COMSAR 12/15, section 5
6	Matters concerning search and rescue, including those related to the 1979 SAR Conference and the implementation of the GMDSS		
	.1 harmonization of aeronautical and maritime search and rescue procedures, including SAR training matters Strategic direction: 2 High-level action: 2.3.1 Planned output: 2.3.1.5	2009	COMSAR 12/15, paragraphs 6.1 to 6.15, 6.65 to 6.75 and 6.91 to 6.92
	.2 plan for the provision of maritime SAR services, including procedures for routeing distress information in the GMDSS Strategic direction: 2 High-level action: 2.3.1 Planned output: 2.3.1.1/2.3.1.2	Continuous	COMSAR 12/15, paragraphs 6.16 to 6.59 and 6.76 to 6.90
	.3 revision of the IAMSAR Manual Strategic direction: 1.3 High-level action: 1.3.5 Planned output: 1.3.5.2	Continuous	MSC 71/23, paragraph 20.2; COMSAR 12/15, section 8
7	Casualty analysis (coordinated by FSI) Strategic direction: 12.1 High-level action: 12.1.2 Planned output: 12.1.2.1 to .2	Continuous	MSC 70/23, paragraphs 9.17 and 20.4; MSC 78/26, paragraph 24.8

# Sub-Committee on Radiocommunications and Search and Rescue (COMSAR) (continued)

			Target completion date/number of sessions needed for completion	Reference
H.1	Developments in maritime radiocommunication syste technology Strategic direction: High-level action: Planned output:	e ems and 5.2 - -	2009	MSC 74/24, paragraph 21.25.1; COMSAR 12/15, section 7
H.2	Development of procedure updating shipborne navigs communication equipmen (coordinated by NAV) Strategic direction: High-level action: Planned output:	es for ation and t 5.2 - -	2010	MSC 83/28, paragraph 25.30
H.3	Measures to protect the sa persons rescued at sea Strategic direction: High-level action: Planned output:	5.1 5.1.2	2010	MSC 84/24, paragraphs 22.25 and 22.36
H.4	Safety provisions applicable operating from passenger sh (coordinated by DE) Strategic direction: High-level action: Planned output:	e to tenders nips 5.2 5.2.1 -	3 sessions	MSC 84/24, paragraph 22.35

# SUB-COMMITTEE ON SAFETY OF NAVIGATION (NAV)

				Target completion date/number of sessions needed for completion	Reference
1	Rou relat Sti Hi Pl	teing of ships, ship ted matters rategic direction: igh-level action: anned output:	5.2 5.2.4 5.2.4.1	Continuous	MSC 72/23, paragraphs 10.69 to 10.71, 20.41 and 20.42; NAV 53/22, section 3
2	Casu Sti Hi Pl	<b>alty analysis</b> (coo rategic direction: gh-level action: anned output:	rdinated by FSI) 12.1 12.1.2 12.1.2.1 to .2	Continuous	MSC 70/23, paragraphs 9.17 and 20.4; NAV 53/22, section 17
3	Cons inter Sta Hi Pl	sideration of IACS pretations rategic direction: gh-level action: anned output:	5 unified 1.1 1.1.2 1.1.2.1	Continuous	MSC 78/26, paragraph 22.12; NAV 53/22, section 18
H.1	Wor (WV Sti Hi Pl	<b>Idwide radionavig</b> VRNS) rategic direction: igh-level action: anned output:	5.2 5.2.4	2008	MSC 75/24, paragraph 22.37; NAV 53/22, section 12
	.1	new development GNSS, especially	s in the field of Galileo	2008	
	.2	review and amend policy for GNSS (resolution A.915	lment of IMO (22))	2008	
	.3	recognition of rad systems as compo WWRNS (resolut	ionavigation ments of the ion A.953(23))	2008	

**Notes:** 1 "H" means a high priority item and "L" means a low priority item. However, within the high and low priority groups, items have not been listed in any order of priority.

2 Items printed in **bold** letters have been selected for the provisional agenda for NAV 54.

		Target completion date/number of sessions needed for completion	Reference
H.2	ITU matters Strategic direction: 5.2 High-level action: 5.2.4 Planned output: -	2009	MSC 69/22, paragraphs 5.69 and 5.70; NAV 53/22, section 9
	.1 Radiocommunication ITU Group 8 matters	<b>R Study</b> 2008	
Н.3	Development of guidelines for I including performance standar bridge alert management Strategic direction: 5.2 High-level action: 5.2.4 Planned output: -	<b>BS,</b> 2009 Is for	MSC 78/26, paragraph 24.30; NAV 53/22, section 4
H.4	Amendments to COLREG Ann related to colour specification of Strategic direction:5.2High-level action:5.2.4Planned output:5.2.4.1	ex I 2008 Flights	MSC 80/24, paragraph 21.24.1; NAV 53/22, section 8
H.5	Carriage requirements for a brnavigational watch alarm systemStrategic direction:5.2High-level action:5.2.4Planned output:-	dge 2008 n	MSC 81/25, paragraph 23.27; NAV 53/22, section 6
H.6	<b>Development of an e-navigation</b> <b>strategy</b> (in cooperation with CO <i>Strategic direction:</i> 5.2 <i>High-level action:</i> 5.2.4 <i>Planned output:</i> -	2008 MSAR)	MSC 81/25, paragraphs 23.34 to 23.37; NAV 53/22, section 13
H.7	<b>Development of carriage requir</b> for ECDIS Strategic direction: 5.2 High-level action: 5.2.4 Planned output: 5.2.4.1	ements 2008	MSC 81/25, paragraphs 23.39 and 23.40; NAV 53/22, section 14

			Target completion date/number of sessions needed for completion	Reference
H.8	Guidelines for uniform limitations of high-spec (coordinated by DE) Strategic direction: High-level action: Planned output:	5.2 5.2.4 5.2.4.2	2008	MSC 81/25, paragraph 23.45; NAV 53/22, section 15
H.9	Guidelines on the layor design of safety centres ships Strategic direction: High-level action: Planned output:	5.2 5.2.4 5.2.4.2	2008	MSC 81/25, paragraph 23.42; NAV 53/22, section 16
H.10	Amendments to the Ge on Ships' Routeing Strategic direction: High-level action: Planned output:	5.2 5.2.4 5.2.4.2	2008	MSC 82/24, paragraph 21.34
H.11	Review of COLREGS of right of way of vessels pleasure craft Strategic direction: High-level action: Planned output:	5.2 5.2.4 5.2.4.1	2008	MSC 82/24, paragraph 21.35
H.12	Code of conduct durin campaigns against ship (in cooperation with FSI Strategic direction: High-level action: Planned output:	g demonstrations/ os on high seas () 5.2 5.2.4 5.2.4.2	2009	MSC 82/24, paragraph 21.36
H.13	Measures to minimize transmissions by AIS e (in cooperation with FSI as necessary) Strategic direction: High-level action: Planned output:	<b>incorrect data</b> equipment I and COMSAR, 5.2 5.2.4 5.2.4.2	2009	MSC 82/24, paragraph 21.38

			Target completion date/number of sessions needed for completion	Reference
H.14	<b>Review of vague expre</b> <b>regulation V/22</b> Strategic direction: High-level action: Planned output:	ssions in SOLAS 5.2 5.2.4 5.2.4.2	2009	MSC 82/24, paragraphs 21.39 to 21.40
H.15	<b>Revision of the Guidan</b> <b>application of AIS bins</b> <i>Strategic direction:</i> <i>High-level action:</i> <i>Planned output:</i>	<i>ary messages</i> 5.2 5.2.4 5.2.4.2	2009	MSC 82/24, paragraph 21.41
H.16	Improved safety of pile arrangements (in coop Strategic direction: High-level action: Planned output:	ot transfer eration with DE) 5.2 5.2.4 5.2.4.2	2009	MSC 82/24, paragraph 21.42
H.17	Amendments to the Pers standards for VDR and Strategic direction: High-level action: Planned output:	formance S-VDR 5.2 5.2.4	3 sessions	MSC 83/28, paragraph 25.34; MSC 84/24, paragraph 22.44
H.18	Development of proced shipborne navigation an equipment (in cooperati COMSAR) Strategic direction: High-level action: Planned output:	ures for updating d communication on with 5.2 5.2.4	2 sessions	MSC 83/28, paragraph 25.33
H.19	Safety provisions applic operating from passenge (coordinated by DE) Strategic direction: High-level action: Planned output:	eable to tenders er ships 5.2 5.2.4	3 sessions	MSC 84/24, paragraph 22.40

			Target completion date/number of sessions needed for completion	Reference
H.20	Guidelines for consider for safety zones larger around artificial islands, structures in the EEZ Strategic direction: High-level action: Planned output:	ation of requests than 500 metres installations and 5.2 5.2.4	2 sessions	MSC 84/24, paragraph 22.41

# SUB-COMMITTEE ON SHIP DESIGN AND EQUIPMENT (DE)

			Target completion date/number of sessions needed for completion	Reference
1	Casualty analysis (coordinated by FSI) Strategic direction: High-level action: Planned output:	12.1 12.1.2 12.1.2.1 to .2	Continuous	MSC 70/23, paragraphs 9.17 and 20.4; DE 50/27, section 17
2	<b>Consideration of IACS a</b> <b>interpretations</b> <i>Strategic direction:</i> <i>High-level action:</i> <i>Planned output:</i>	1.1 1.1.2 1.1.2.1	Continuous	MSC 78/26, paragraph 22.12; DE 51/28, section 22
H.1	Amendments to resoluti Strategic direction: High-level action: Planned output:	on A.744(18) 5.2 5.2.1 5.2.1.1	2009	DE 45/27, paragraphs 7.18 and 7.19; DE 51/28, section 3
H.2	Measures to prevent acc lifeboats (in cooperation v and STW) Strategic direction: High-level action: Planned output:	<b>Sidents with</b> with FSI, NAV 5.1 5.1.2 5.1.2.1	2010	MSC 74/24, paragraph 21.34; DE 51/28, section 8
H.3	<b>Compatibility of life-sav</b> Strategic direction: High-level action: Planned output:	ing appliances 5.1 5.1.2 5.1.2.2	2009	DE 47/15, paragraph 5.3; MSC 78/26, paragraph 24.37.1; DE 51/28, section 9
H.4	Development of provision ships (coordinated by BLC Strategic direction: High-level action: Planned output:	as for gas-fuelled G) 5.2 5.2.1 5.2.1.1	2 sessions	MSC 78/26, paragraph 24.39; DE 51/28, section 4

**Notes:** 1 "H" means a high priority item and "L" means a low priority item. However, within the high and low priority groups, items have not been listed in any order of priority.

<sup>2</sup> Items printed in bold letters have been selected for the provisional agenda for DE 52.

# Sub-Committee on Ship Design and Equipment (DE) (continued)

			Target completion date/number of sessions needed for completion	Reference
H.5	Test standards for extended of inflatable in the strategic direction: High-level action: Planned output:	nded service iferafts 5.1 5.1.2 5.1.2.3	2009	MSC 78/26, paragraph 24.41; DE 51/28, section 10
H.6	Amendments to the Gu ships operating in Arct waters (in cooperation v as necessary) Strategic direction: High-level action: Planned output:	<b>idelines for</b> <b>ic ice-covered</b> vith SLF, 5.2 5.2.1 5.2.1.2	2010	MSC 79/23, paragraph 8.25; DE 51/28, section 11
H.7	Revision of the Code on Alarms andIndicators (in cooperation with appropriate sub-committees, as necessary)Strategic direction:2High-level action:2.1.1Planned output:2.1.1.2		2009	MSC 79/23, paragraph 20.28; DE 51/28, section 6
H.8	Amendments to the Me Strategic direction: High-level action: Planned output:	<b>ODU Code</b> 2 2.1.1 2.1.1.2	2009	MSC 79/23, paragraph 22.51; DE 51/28, section 7
H.9	Guidelines for uniform operating limitations of high-speed craft (in cooperation with COMSAR, NAV and SLF) Strategic direction: 5.2 High-level action: 5.2.1 Planned output: 5.2.1.2		2009	MSC 81/25, paragraph 23.45; DE 51/28, section 13
H.10	Guidelines for mainten of protective coatings Strategic direction: High-level action: Planned output:	ance and repair 2 2.1.1 2.1.1.2	2009	MSC 81/25, paragraph 23.48.1; DE 51/28, section 14
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# Sub-Committee on Ship Design and Equipment (DE) (continued)

			Target completion date/number of sessions needed for completion	Reference
H.11	Performance standards systems Strategic direction: High-level action: Planned output:	for recovery 5.1 5.1.1 5.1.1.1	2010	MSC 81/25, paragraph 23.49.1; DE 51/28, section 16
H.12	Guidance to ensure cons for determining the nee doors to remain open du Strategic direction: High-level action: Planned output:	sistent policy d for watertight uring navigation 2 2.1.1 2.1.1.2	2009	SLF 49/17, paragraph 3.11; MSC 82/24, paragraph 21.47; DE 51/28, section 26
H.13	<b>Development of a new f</b> <b>requirements for life-sa</b> (in cooperation with FP a as necessary)	ramework of ving appliances nd COMSAR,	2012	MSC 82/24, paragraph 21.49
H.14	Improved safety of pilot to arrangements (coordinate Strategic direction: High-level action: Planned output:	ransfer d by NAV) 5.2 5.2.4 5.2.4.2	2 sessions	MSC 82/24, paragraph 21.50
H.15	Cargo oil tank coating a protection Strategic direction: High-level action: Planned output:	5.2	2009	MSC 82/24, paragraphs 21.51 and 23.12; DE 51/28, section 19
H.16	Development of safety of functional requirements of on alternative design and for SOLAS chapters II-1 <i>Strategic direction:</i> <i>High-level action:</i> <i>Planned output:</i>	bjectives and of the Guidelines arrangements and III 5.2 -	3 sessions	MSC 82/24, paragraphs 3.92 and 21.52

# Sub-Committee on Ship Design and Equipment (DE) (continued)

		Target completion date/number of sessions needed for completion	Reference
H.17	Protection against noise on board shipsStrategic direction:5.2High-level action:-Planned output:-	2 sessions	MSC 83/28, paragraph 25.41
H.18	Thermal performance of immersion suitsStrategic direction:5.1High-level action:5.1.2Planned output:-	2 sessions	MSC 84/24, paragraph 22.48
H.19	Amendments to the Revised recommendation on testing of life-saving appliances Strategic direction: 5.1 High-level action: 5.1.2 Planned output: -	2 sessions	MSC 84/24, paragraph 22.49
H.20	Safety provisions applicable to tenders operating from passenger ships (in cooperation with FP, COMSAR, NAV, SLF and STW) <i>Strategic direction:</i> 5.2 <i>High-level action:</i> 5.2.1 <i>Planned output:</i> -	3 sessions	MSC 84/24, paragraph 22.50
H.21	Alternative arrangements for the bottom inspection requirements for passenger ships other than ro-ro passenger ships <i>Strategic direction:</i> 5.2 <i>High-level action:</i> 5.2.1 <i>Planned output:</i> -	1 session	MSC 84/24, paragraph 22.52

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# Sub-Committee on Ship Design and Equipment (DE) (continued)

			Target completion date/number of sessions needed for completion	Reference
L.1	<b>Revision of resolution</b> Strategic direction: High-level action: Planned output:	<b>A.760(18)</b> 5.2 5.2.1 5.2.1.2	2010	DE 46/32, paragraph 31.23; DE 51/28, section 12
L.2	Free-fall lifeboats with f capabilities Strategic direction: High-level action: Planned output:	5.1 5.1.2	1 session	MSC 76/23, paragraphs 20.41.3 and 20.48; DE 47/25, paragraph 22.6
L.3	Guidelines on equivalent onboard NO <sub>x</sub> emissions Strategic direction: High-level action: Planned output:	t methods to reduce 2 - -	2 sessions	MEPC 41/20, paragraph 8.22.1; BLG 10/19, paragraph 12.3; MEPC 55/23, paragraph 19.9
L.4	Performance standards for Strategic direction: High-level action: Planned output:	or protective coatings 2 2.1.1 2.1.1.2	2 sessions	MSC 76/23, paragraphs 20.41.2 and 20.48; DE 50/27, section 4
	.1 mandatory applic Performance stan protective coating on bulk carriers a	ation of the dard for gs for void spaces nd oil tankers	2 sessions	
	.2 performance stan protective coating on all types of shi	dard for gs for void spaces ps	2 sessions	

# SUB-COMMITTEE ON STABILITY AND LOAD LINES AND ON FISHING VESSELS SAFETY (SLF)

			Target completion date/number of sessions needed for completion	Reference
1	Analysis of intact stabili Strategic direction: High-level action: Planned output:	ty casualty records 12.1 12.1.2 12.1.2.1 to .2	Continuous	MSC 70/23, paragraph 20.4; SLF 30/18, paragraphs 4.16 and 4.17
2	Analysis of damage card Strategic direction: High-level action: Planned output:	ls 12.1 12.1.2 12.1.2.1	Continuous	MSC 70/23, paragraph 20.4; SLF 50/19, section 12
3	<b>Consideration of IACS</b> <b>interpretations</b> Strategic direction: High-level action: Planned output:	unified 1.1 1.1.2 1.1.2.1	Continuous	MSC 78/26, paragraph 22.12
H.1	Development of explan harmonized SOLAS ch Strategic direction: High-level action: Planned output:	atory notes for apter II-1 2.1 2.1.1 2.1.1.2	2008	MSC 69/22, paragraph 20.60.1; SLF 50/19, section 3
H.2	Safety of small fishing (in cooperation with DE, NAV and STW, as neces Strategic direction: High-level action: Planned output:	vessels , COMSAR, FP, ssary) 5.2 5.2.1 5.2.1 5.2.1.2	2010	MSC 79/23, paragraphs 11.15 and 20.32; SLF 50/19, section 5 MSC 83/28, paragraph 25.53
H.3	<b>Revision of the Intact S</b> Strategic direction: High-level action: Planned output:	<b>Stability Code</b> 5.2 5.2.1 5.2.1.2	2010	SLF 41/18, paragraph 3.14; SLF 50/19, section 4

Notes: 1

<sup>&</sup>quot;H" means a high priority item and "L" means a low priority item. However, within the high and low priority groups, items have not been listed in any order of priority. 2

Items printed in **bold** letters have been selected for inclusion in the provisional agenda for SLF 51.

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Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety (SLF) (continued)

			Target completion date/number of sessions needed for completion	Reference
H.4	Development of option on ship design and safe Convention Strategic direction: High-level action: Planned output:	2.1 2.1.1 2.1.1.2	2008	MSC 81/25, paragraph 23.53; SLF 50/19, section 6
H.5	Guidelines for uniform limitations on high-spe (coordinated by DE) Strategic direction: High-level action: Planned output:	5.2 5.2.1 5.2.1 5.2.12	2008	MSC 81/25, paragraph 23.45; SLF 50/19, section 7
H.6	<b>Time-dependent survi</b> <b>passenger ships in dan</b> Strategic direction: High-level action: Planned output:	vability of naged condition 5.1 5.1.2 -	2009	MSC 81/25, paragraph 23.54; SLF 50/19, section 8
H.7	Guidance on the impa watertight doors on ex survivability Strategic direction: High-level action: Planned output:	ct of open isting and new ship 2.1 2.1.1 2.1.1 2.1.1.2	2008	SLF 49/17, section 3; MSC 82/24, paragraph 21.56; SLF 50/19, section 15
H.8	Stability and sea-keep of damaged passenger when returning to por under tow Strategic direction: High-level action: Planned output:	ing characteristics ships in a seaway t by own power or 5.1 5.1.2	2008	MSC 82/24, paragraph 21.57; SLF 50/19, section 8
H.9	Guidelines for drainag vehicle and ro-ro spac category spaces (in coor Strategic direction: High-level action: Planned output:	ge systems in closed es and special operation with FP) 5.1 5.1.1 5.1.12	2009	MSC 83/28, paragraph 25.49

Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety (SLF) (continued)

			Target completion date/number of sessions needed for completion	Reference
H.10	Guidelines for verification ofstability requirements for tailbulk carriers (in cooperationDE and STW as necessary andrequested by SLF)Strategic direction:2.1High-level action:2.1.Planned output:2.1.	f damage mkers and with d when 1 1.2	2009	MSC 83/28, paragraphs 25.50 to 25.52
H.11	Safety provisions applicable to operating from passenger ship by DE) Strategic direction: 5.2 High-level action: 5.2. Planned output: -	o tenders os (coordinated 1	3 sessions	MSC 84/24, paragraph 22.57
H.12	Damage stability regulations for ro-ro passenger ships <i>Strategic direction:</i> 5.1 <i>High-level action:</i> 5.1. <i>Planned output:</i> -	for 1	2 sessions*	MSC 84/24, paragraph 22.59
H.13	Development of an agreent implementation of the 1993 T Protocol (in cooperation with sub-committees, as necessary <i>Strategic direction:</i> 5.2 <i>High-level action:</i> 5.2. <i>Planned output:</i> -	nent on the Forremolinos n appropriate )	2 sessions*	MSC 84/24, paragraph 22.62

<sup>\*</sup> The Sub-Committee has been instructed to include the item in the provisional agenda for SLF 52.

## SUB-COMMITTEE ON STANDARDS OF TRAINING AND WATCHKEEPING (STW)

		Target completion date/number of sessions needed for completion	Reference
1	<b>Validation of model training courses</b> Strategic direction: 5.2 High-level action: 5.2.2 Planned output: –	Continuous	STW 31/17, paragraph 14.4; STW 39/12, section 3
2	Casualty analysis (coordinated by FSI) Strategic direction: 12.1 High-level action: 12.1.2 Planned output: 12.1.2.1 to.2	Continuous	MSC 77/26, paragraphs 18.10 and 23.40.2; STW 39/12, section 10
H.1	Unlawful practices associated with certificates of competency Strategic direction: 5.2 High-level action: 5.2.1 Planned output: –	Continuous	MSC 71/23, paragraph 20.55.2; STW 39/12, section 4
H.2	Measures to enhance maritime security Strategic direction: 6 High-level action: 6.3.2 Planned output: 6.3.2.1	2010	MSC 75/24, paragraphs 22.9 and 22.45; STW 38/17, section 6
Н.3	Comprehensive review of the STCW Convention and CodeStrategic direction:5High-level action:5.2.2Planned output:5.2.2.1.1chapter I of the STCW Convention and Code.2chapter II of the STCW Convention and Code	2010	STW 37/18, section 15; MSC 81/25, paragraphs 23.57.2, 23.40.2, 23.62 and 23.63; STW 39/12, section 7

Notes:

1

<sup>&</sup>quot;H" means high priority item and "L" means a low priority item. However, within the high and low priority groups, items have not been listed in any order of priority.

<sup>2</sup> Items printed in bold letters have been selected for the provisional agenda for STW 40.

# Sub-Committee on Standards of Training and Watchkeeping (STW) (continued)

	Target completion date/number of sessions needed for completion	Reference
.3 chapter III of the STCW Convention and Code		
.4 chapter IV of the STCW Convention and Code		
.5 chapter V of the STCW Convention and Code		
.6 chapter VI of the STCW Convention and Code		
.7 chapter VII of the STCW Convention and Code		
.8 chapter VIII of the STCW Convention and Code		
<b>Review of the principles for</b> establishing the safe manning level of ships (in cooperation with NAV)	2010	MSC 81/25, paragraphs 23.58 to 23.60;
Strategic direction: 5 High-level action: 5.2.2 Planned output: 5.2.2.2		STW 39/12, section 8
Development of training standards for recovery systems Strategic direction: 5.1 High-level action: 5.1.2 Planned output: -	2 sessions	MSC 81/25, paragraph 23.64
<b>Training for seafarer safety</b> <b>representatives</b> Strategic direction: 5.2 High-level action: 5.2.2 Planned output: -	2009	MSC 82/24, paragraph 21.23; STW 39/12, section 5

H.4

H.5

H.6

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## Sub-Committee on Standards of Training and Watchkeeping (STW) (continued)

		Target completion date/number of sessions needed for completion	Reference
H.7	Safety provisions applicable to tenders operating from passenger ships (coordinated by DE) Strategic direction: 12 High-level action: 12.1.2 Planned output: 12.1.2.1	3 sessions	MSC 84/24, paragraph 22.66
H.8	Mandatoryrequirementsfordeterminingsafemanning(incooperation with NAV as necessary)Strategic direction:12Strategic direction:1212.1.2High-level action:12.1.212.1.2.1	2010	MSC 84/24, paragraph 22.68
L.1	Review of the implementation of STCW chapter VII Strategic direction: 5 High-level action: 5.2.2 Planned output: -	2 sessions	MSC 72/23, paragraph 21.56; STW 35/19, section 14
L.2	Clarification of the STCW-F Convention provisions and follow-up action to the associated Conference resolutions <i>Strategic direction:</i> 5 <i>High-level action:</i> 5.2.1 <i>Planned output:</i> -	2 sessions	STW 34/14, paragraph 11.8
L.3	Development of model procedures for executing shipboard emergency measures Strategic direction: 5 High-level action: 5.2.2 Planned output: 5.2.2.2	2 sessions	MSC 84/24, paragraph 22.67

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#### ANNEX 22

#### **PROVISIONAL AGENDAS FOR THE SUB-COMMITTEES**

## SUB-COMMITTEE ON BULK LIQUIDS AND GASES (BLG) $-13^{TH}$ Session \*

- 1 Adoption of the agenda
- 2 Decisions of other IMO bodies
- 3 Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments
- 4 Application of the requirements for the carriage of bio-fuels and bio-fuel blends
- 5 Development of guidelines and other documents for uniform implementation of the 2004 BWM Convention
- 6 Development of provisions for gas-fuelled ships
- 7 Casualty analysis
- 8 Consideration of IACS unified interpretations
- 9 Development of international measures for minimizing the transfer of invasive aquatic species through bio-fouling of ships
- 10 Review of the Recommendation for material safety data sheets for MARPOL Annex I cargoes and marine fuel oils
- 11 Revision of the IGC Code
- 12 Safety requirements for natural gas hydrate pellet carriers
- 13 Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NOx Technical Code
- 14 Amendments to MARPOL Annex I on the use and carriage of heavy grade oil on ships in the Antarctic area
- 15 Work programme and agenda for BLG 14
- 16 Election of Chairman and Vice-Chairman for 2010
- 17 Any other business
- 18 Report to the Committees

<sup>\*</sup> Agenda item numbers do not necessarily indicate priority.

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#### SUB-COMMITTEE ON DANGEROUS GOODS, SOLID CARGOES AND CONTAINERS (DSC) – 13<sup>TH</sup> SESSION<sup>\*</sup>

- 1 Adoption of the agenda
- 2 Decisions of other IMO bodies
- 3 Amendments to the IMDG Code and supplements, including harmonization of the IMDG Code with the UN Recommendations on the transport of dangerous goods
  - .1 harmonization of the IMDG Code with the UN Recommendations on the transport of dangerous goods
  - .2 amendment (35-10) to the IMDG Code and supplements
- 4 Amendments to the IMSBC Code, including evaluation of properties of solid bulk cargoes
- 5 Amendments to the CSS Code
- 6 Casualty and incident reports and analysis
- 7 Extension of the BLU Code to include grain
- 8 Guidance on providing safe working conditions for securing of containers
- 9 Review of the Recommendations on the safe use of pesticides in ships
- 10 Guidance on protective clothing
- 11 Revision of the Code of safe practice for ships carrying timber deck cargoes
- 12 Form and procedure for approval of the Cargo securing manual
- 13 Stowage of water-reactive materials
- 14 Amendments to the International Convention for Safe Containers, 1972
- 15 Review of the Guidelines for packing of cargo transport units
- 16 Review of documentation requirements for dangerous goods in packaged form
- 17 Work programme and agenda for DSC 14
- 18 Election of Chairman and Vice-Chairman for 2009
- 19 Any other business
- 20 Report to the Maritime Safety Committee

<sup>\*</sup> Agenda item numbers do not necessarily indicate priority. I:\MSC\84\24-Add-2.doc

# SUB-COMMITTEE ON FIRE PROTECTION (FP) $-53^{RD}$ session \*

- 1 Adoption of the agenda
- 2 Decisions of other IMO bodies
- 3 Performance testing and approval standards for fire safety systems
- 4 Comprehensive review of the Fire Test Procedures Code
- 5 Measures to prevent explosions on oil and chemical tankers transporting low-flash point cargoes
- 6 Fire resistance of ventilation ducts
- 7 Guidelines for drainage systems in closed vehicle and ro-ro spaces and special category spaces
- 8 Clarification of SOLAS chapter II-2 requirements regarding interrelation between central control station and safety centre
- 9 Recommendation on evacuation analysis for new and existing passenger ships
- 10 Measures to prevent fires in engine-rooms and cargo pump-rooms
- 11 Development of provisions for gas-fuelled ships
- 12 Consideration of IACS unified interpretations
- 13 Fixed hydrocarbon gas detection systems on double-hull oil tankers
- 14 Harmonization of the requirements for the location of entrances, air inlets and openings in the superstructures of tankers
- 15 Amendments to SOLAS chapter II-2 related to the releasing controls and means of escape for spaces protected by fixed carbon dioxide systems
- 16 Means of escape from machinery spaces
- 17 Review of fire protection requirements for on-deck cargo areas
- 18 Explanatory notes for the application of the safe return to port requirements
- 19 Analysis of fire casualty records

<sup>\*</sup> Agenda item numbers do not necessarily indicate priority.

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- 20 Work programme and agenda for FP 54
- 21 Election of Chairman and Vice-Chairman for 2010
- 22 Any other business
- 23 Report to the Maritime Safety Committee

# SUB-COMMITTEE ON FLAG STATE IMPLEMENTATION (FSI) $-16^{TH}$ session<sup>\*</sup>

- 1 Adoption of the agenda
- 2 Decisions of other IMO bodies
- 3 Responsibilities of Governments and measures to encourage flag State compliance
- 4 Mandatory reports under MARPOL
- 5 Port reception facilities-related issues
- 6 Casualty statistics and investigations
- 7 Harmonization of port State control activities
- 8 Development of guidelines on port State control under the 2004 BWM Convention
- 9 PSC Guidelines on seafarers' working hours
- 10 Comprehensive analysis of difficulties encountered in the implementation of IMO instruments
- 11 Review of the Survey Guidelines under the HSSC (resolution A.948(23))
- 12 Consideration of IACS Unified Interpretations
- 13 Illegal, unregulated and unreported (IUU) fishing and implementation of resolution A.925(22)
- 14 Review of the Code for the Implementation of Mandatory IMO Instruments
- 15 Work programme and agenda for FSI 17
- 16 Election of Chairman and Vice-Chairman for 2009
- 17 Any other business
- 18 Report to the Committees

<sup>\*</sup> Agenda item numbers do not necessarily indicate priority.

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#### SUB-COMMITTEE ON RADIOCOMMUNICATIONS AND SEARCH AND RESCUE (COMSAR) – $13^{TH}$ session\*

- 1 Adoption of the agenda
- 2 Decisions of other IMO bodies
- 3 Global Maritime Distress and Safety System (GMDSS)
  - .1 matters relating to the GMDSS Master Plan
  - .2 operational and technical coordination provisions of maritime safety information (MSI) services, including review of the related documents
- 4 ITU maritime radiocommunication matters
  - .1 Radiocommunication ITU-R Study Group matters
  - .2 ITU World Radiocommunication Conference matters
- 5 Satellite services (Inmarsat and COSPAS-SARSAT)
- 6 Matters concerning search and rescue, including those related to the 1979 SAR Conference and the implementation of the GMDSS
  - .1 harmonization of aeronautical and maritime search and rescue procedures, including SAR training matters
  - .2 plan for the provision of maritime SAR services, including procedures for routeing distress information in the GMDSS
- 7 Developments in maritime radiocommunication systems and technology
- 8 Revision of the IAMSAR Manual
- 9 Development of procedures for updating shipborne navigation and communication equipment
- 10 Measures to protect the safety of persons rescued at sea
- 11 Work programme and agenda for COMSAR 14
- 12 Election of Chairman and Vice-Chairman for 2010
- 13 Any other business
- 14 Report to the Maritime Safety Committee

<sup>\*</sup> Agenda item numbers do not necessarily indicate priority.

# SUB-COMMITTEE ON SAFETY OF NAVIGATION (NAV) $-54^{\text{TH}}$ session<sup>\*</sup>

- 1 Adoption of the agenda
- 2 Decisions of other IMO bodies
- 3 Routeing of ships, ship reporting and related matters
- 4 Development of guidelines for IBS, including performance standards for bridge alert management
- 5 Amendments to the General Provisions on Ships' Routeing
- 6 Carriage requirements for a bridge navigational watch alarm system
- 7 Review of COLREGs regarding the right of way of vessels over pleasure craft
- 8 Amendments to COLREG Annex I related to colour specification of lights
- 9 ITU matters, including Radiocommunication ITU-R Study Group 8 matters
- 10 Code of conduct during demonstrations/campaigns against ships on high seas
- 11 Measures to minimize incorrect data transmissions by AIS equipment
- 12 Worldwide radionavigation system (WWRNS)
- 13 Development of an e-navigation strategy
- 14 Development of carriage requirements for ECDIS
- 15 Guidelines for uniform operating limitations of high-speed craft
- 16 Guidelines on the layout and ergonomic design of safety centres on passenger ships
- 17 Review of vague expressions in SOLAS regulation V/22
- 18 Revision of the Guidance on the application of AIS binary message
- 19 Improved safety of pilot transfer arrangements
- 20 Casualty analysis

<sup>\*</sup> Agenda item numbers do not necessarily indicate priority.

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- 21 Consideration of IACS unified interpretations
- 22 Work programme and agenda for NAV 55
- 23 Election of Chairman and Vice-Chairman for 2009
- 24 Any other business
- 25 Report to the Maritime Safety Committee

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# SUB-COMMITTEE ON SHIP DESIGN AND EQUIPMENT (DE) $-52^{ND}$ session \*

- 1 Adoption of the agenda
- 2 Decisions of other IMO bodies
- 3 Amendments to resolution A.744(18)
- 4 Revision of the Code on Alarms and Indicators
- 5 Amendments to the MODU Code
- 6 Measures to prevent accidents with lifeboats
- 7 Compatibility of life-saving appliances
- 8 Test standards for extended service intervals of inflatable liferafts
- 9 Amendments to the Guidelines for ships operating in Arctic ice-covered waters
- 10 Revision of resolution A.760(18)
- 11 Guidelines for uniform operating limitations of high-speed craft
- 12 Guidelines for maintenance and repair of protective coatings
- 13 Performance standards for recovery systems
- 14 Cargo oil tank coating and corrosion protection
- 15 Guidance to ensure consistent policy for determining the need for watertight doors to remain open during navigation
- 16 Development of a new framework of requirements for life-saving appliances
- 17 Consideration of IACS unified interpretations
- 18 Work programme and agenda for DE 53
- 19 Election of Chairman and Vice-Chairman for 2010
- 20 Any other business
- 21 Report to the Maritime Safety Committee

<sup>\*</sup> Agenda item numbers do not necessarily indicate priority.

# SUB-COMMITTEE ON STABILITY AND LOAD LINES AND ON FISHING VESSELS SAFETY (SLF) - $51^{\rm st}$ session\*

- 1 Adoption of the agenda
- 2 Decisions of other IMO bodies
- 3 Development of explanatory notes for harmonized SOLAS chapter II-1
- 4 Revision of the Intact Stability Code
- 5 Safety of small fishing vessels
- 6 Development of options to improve effect on ship design and safety of the 1969 TM Convention
- 7 Guidelines for uniform operating limitations on high-speed craft
- 8 Time dependant survivability of passenger ships in damaged condition
- 9 Consideration of IACS unified interpretations
- 10 Guidance on the impact of open watertight doors on existing and new ship survivability
- 11 Stability and sea-keeping characteristics of damaged passenger ships in a seaway when returning to port by own power or under tow
- 12 Guidelines for drainage systems in closed vehicle and ro-ro spaces and special category spaces
- 13 Guidelines for verification of damage stability requirements for tankers and bulk carriers
- 14 Work programme and agenda for SLF 52
- 15 Election of Chairman and Vice-Chairman for 2009
- 16 Any other business
- 17 Report to the Maritime Safety Committee

<sup>\*</sup> Agenda item numbers do not necessarily indicate priority.

#### SUB-COMMITTEE ON STANDARDS OF TRAINING AND WATCHKEEPING (STW) – $40^{TH}$ session \*

Opening of the session

- 1 Adoption of the agenda
- 2 Decisions of other IMO bodies
- 3 Validation of model training courses
- 4 Unlawful practices associated with certificates of competency
- 5 Training for seafarer safety representatives
- 6 Casualty analysis
- 7 Comprehensive review of the STCW Convention and Code
  - .1 chapter I of the STCW Convention and Code
  - .2 chapter II of the STCW Convention and Code
  - .3 chapter III of the STCW Convention and Code
  - .4 chapter IV of the STCW Convention and Code
  - .5 chapter V of the STCW Convention and Code
  - .6 chapter VI of the STCW Convention and Code
  - .7 chapter VII of the STCW Convention and Code
  - .8 chapter VIII of the STCW Convention and Code
- 8 Review of the principles for establishing the safe manning level of ships
- 9 Measures to enhance maritime security
- 10 Mandatory requirements for determining safe manning
- 11 Work programme and agenda for STW 41
- 12 Election of Chairman and Vice-Chairman for 2010
- 13 Any other business
- 14 Report to the Maritime Safety Committee

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<sup>\*</sup> Agenda item numbers do not necessarily indicate priority.

#### ANNEX 23

#### STATEMENT BY THE DELEGATION OF PANAMA

While we welcome the submission of this document, we wish to begin by saying that the proposal it contains is neither sufficiently justified nor practicable to merit inclusion of a new item in the agenda and work programme of the FSI Sub-Committee.

Before proceeding with a proposal on this scale it is essential to define certain aspects clearly, in particular with respect to the competence and responsibility of each administration.

Maritime administrations have delegated to recognized organizations (ROs) the responsibility for survey and for issuing statutory and technical certificates, on the basis of duly approved IMO resolutions and guidelines and their own legislation.

What cannot be delegated - for any reason - is an administration's ultimate responsibility to supervise what it has delegated.

Each administration has the power and responsibility to verify that delegated tasks are carried out in accordance with law.

IMO has already adopted and brought into effect instruments to ensure effective supervision of Ros, examples being Assembly resolutions A.739(18), A.789(19) and A.973(24). These are supplemented by the maritime legislation approved by each country and by the recently developed Voluntary IMO Member State Audit Scheme, whose results are still being evaluated.

What added value do initiatives of the kind under discussion bring to what has already been put in place? The Audit Scheme must be given time to achieve its planned and expected objectives.

Turning to document MSC 84/22/13, we note that in paragraphs 4.1 and 4.2 no justification or reasoning for the proposal is given, although they deal with the proposed Code's scope and purpose – matters which are already specifically addressed in the above-mentioned instruments. With regard to paragraph 5.3, appointing other suitable qualified personnel who would also be independent could have the result that the proposed Code would contradict an administration's regulations in this area. In other words, there already exist auditors suitably qualified to audit an activity as delegated: our administration has already established regulations for auditing its Ors, and it is only the administration that does this.

We consider that paragraphs 9.2 to 9.4 call into question not only the mechanisms that administrations currently use, but also the latter's transparency and independence. Reducing the burden on administrations has to be examined at the level of the administrations and on the basis of how they decide to exercise their duties and responsibilities towards their Ros as an unavoidable obligation. These paragraphs especially call into question the Audit Scheme and its effectiveness, denying the scheme, which has only recently been brought into operation, the opportunity to acquire necessary experience.

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Paragraph 13 again refers to using the proposed Code as part of the IMO regulatory process, when in reality, as mentioned in paragraph 3, it only has a bearing on the consistency with which the Organization's Members apply the regulations already in place. Panama maintains that we must focus our efforts on ratifying the existing instruments.

On the basis of the foregoing, Panama considers that this proposal should not be accepted until the aspects we have mentioned are clarified and evaluated, particularly those of a political and jurisdictional nature.

In conclusion, we wish to reiterate the importance of ensuring that the Committee's efforts are directed towards development and implementation of the existing instruments.

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MARITIME SAFETY COMMITTEE 84th session Agenda item 24 MSC 84/24/Add.3 5 June 2008 Original: ENGLISH

### REPORT OF THE MARITIME SAFETY COMMITTEE ON ITS EIGHTY-FOURTH SESSION

Attached is annex 12 to the report of the Maritime Safety Committee on its eighty-fourth session (MSC 84/24).

(See document MSC 84/24/Add.1 for annexes 1 to 8 and document MSC 84/24/Add.2 for annexes 9 to 11 and 13 to 23)

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## ANNEX 12

#### **DRAFT MSC RESOLUTION**

#### ADOPTION OF 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 the adoption by the Committee of resolution MSC.193(79) on the Code of Safe Practice for Solid Bulk Cargoes (BC Code),

RECOGNIZING the need to provide a mandatory application of the agreed international standards for the carriage of solid bulk cargoes by sea,

NOTING ALSO resolution MSC.[...(85)] by which it adopted amendments to chapters VI and VII of the International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended (hereinafter referred to as "the Convention"), to make the provisions of the International Maritime Solid Bulk Cargoes (IMSBC) Code, mandatory under the Convention,

HAVING CONSIDERED, at its [eighty-fifth] session, the text of the proposed International Maritime Solid Bulk Cargoes (IMSBC) Code,

1. ADOPTS the IMSBC Code, as prepared by the Sub-Committee on Dangerous Goods, Solid Cargoes at its twelfth session, the text of which is set out in the Annex to the present resolution;

2. NOTES that, under the aforementioned amendments to chapter VI of the Convention, future amendments to the IMSBC Code shall be adopted, brought into force and shall take effect in accordance with the provisions of article VIII of the Convention concerning the amendments procedures applicable to the Annex to the Convention other than chapter I thereof;

3. INVITES Contracting Governments to the Convention to note that the IMSBC Code will take effect on [1 January 2011] upon entry into force of amendments to chapters VI and VII of the Convention;

4. AGREES that Contracting Governments to the Convention may apply the IMSBC Code in whole or in part on a voluntary basis as from [1 January 2009];

5. REQUESTS the Secretary-General to transmit certified copies of this resolution and its Annex to all Contracting Governments to the Convention;

6. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annex to all Members of the Organization which are not Contracting Governments to the Convention;

7. NOTES that the annexed IMSBC Code supersedes the existing Code adopted by resolution MSC.193(79).

#### ANNEX

#### DRAFT INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE

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#### FOREWORD

The International Convention for the Safety of Life at Sea, 1974 (SOLAS Convention), as amended, deals with various aspects of maritime safety and contains, in parts A and B of chapter VI and part B of chapter VII, the mandatory provisions governing the carriage of solid bulk cargoes and the carriage of dangerous goods in solid form in bulk, respectively. These provisions are amplified in the International Maritime Solid Bulk Cargoes Code (IMSBC Code).

Detailed fire protection arrangements for ships carrying solid bulk cargoes are incorporated into chapter II-2 of the SOLAS Convention by regulations 10 and 19. Attention is drawn to regulation II-2/19.4 (or II-2/54.3) of the SOLAS Convention as amended. This provides for an appropriate document as evidence of compliance of construction and equipment with the requirements of regulation II-2/19 (or II.2/54) to be issued to ships carrying dangerous goods in solid form in bulk, as defined in regulation VII/7 of the Convention, except class 6.2 and class 7, which are:

- cargo ships of 500 gross tonnage or over constructed on or after 1 September 1984; or
- cargo ships of less than 500 gross tonnage constructed on or after 1 February 1992.

The IMSBC Code that was adopted by resolution [MSC.xx(85)] was recommended to Governments for adoption or for use as the basis for national regulations in pursuance of their obligations under regulation of the SOLAS Convention, as amended. The Code is mandatory under the provision of the SOLAS Convention from [date of entry into force]. However, some parts of the Code continue to be recommendatory or informative. It needs to be emphasized that, in the context of the language of the Code: the words "shall", "should" and "may", when used in the Code, mean that the relevant provisions are "mandatory", "recommendatory" and "optional", respectively. Observance of the Code harmonizes the practices and procedures to be followed and the appropriate precautions to be taken in the loading, trimming, carriage and discharge of solid bulk cargoes when transported by sea, ensuring compliance with the mandatory provisions of the SOLAS Convention.

The Code has undergone many changes, both in layout and content, in order to keep pace with the expansion and progress of industry. Maritime Safety Committee (MSC) is authorized by the Organization's Assembly to adopt amendments to the Code, thus enabling the IMO to respond promptly to developments in transport.

The MSC at its eighty-fifth session agreed that, in order to facilitate the safe transport of solid bulk cargoes, the provisions of the Code may be applied from 1 January 2009 on a voluntary basis, pending their official entry into force on 1 January 2011 without any transitional period. This is described in resolution [MSC.xx(85)].

#### Section 1

#### **General provisions**

#### **1.1** Introductory note

The problems involved in the carriage of bulk cargoes were recognized by the delegates to the 1960 International Conference on Safety of Life at Sea, but at that time it was not possible to frame detailed requirements, except for the carriage of grain. The Conference did recommend, however, in paragraph 55 of Annex D to the Convention, that an internationally acceptable code of safe practice for the shipment of bulk cargoes should be drawn up under the sponsorship of the International Maritime Organization (IMO). This work was undertaken by the Organization's Sub-Committee on Containers and Cargoes and several editions of the Code of Safe Practice for solid Bulk Cargoes (BC Code) have been published, since the first edition in 1965. The Sub-Committee was expanded to include dangerous goods and is now called the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC Sub-Committee).

The prime hazards associated with the shipment of solid bulk cargoes are those relating to structural damage due to improper cargo distribution, loss or reduction of stability during a voyage and chemical reactions of cargoes. Therefore the primary aim of this Code is to facilitate the safe stowage and shipment of solid bulk cargoes by providing information on the dangers associated with the shipment of certain types of solid bulk cargoes and instructions on the procedures to be adopted when the shipment of solid bulk cargoes is contemplated. The requirements for the transport of grain are covered by the International Code for the Safe Carriage of Grain in Bulk (International Grain Code, 1991).

#### **1.2** Cargoes listed in this Code

1.2.1 Typical cargoes currently shipped in bulk, together with advice on their properties and methods of handling, are given in the schedules for individual cargoes. However, these schedules are not exhaustive and the properties attributed to the cargoes are given only for guidance. Consequently, before loading, it is essential to obtain current valid information from the shipper on the physical and chemical properties of the cargoes presented for shipment. The shipper shall provide appropriate information about the cargo to be shipped (see section 4.2).

1.2.2 The master shall consult the appropriate cargo schedule in this Code and observe all necessary precautions. The master shall consider to consult the authorities at the ports of loading and discharge, as necessary, concerning the requirements which may be in force and applicable for the carriage.

#### **1.3** Cargoes not listed in this Code

1.3.1 If a solid cargo which is not listed in appendix 1 to this Code is proposed for carriage in bulk, the shipper shall, prior to loading, provide the competent authority of the port of loading with the characteristics and properties of the cargo in accordance with section 4 of this Code. Based on the information received, the competent authority will assess the acceptability of the cargo for safe shipment.

1.3.1.1 When it is assessed that the solid bulk cargo proposed for carriage may present hazards as those defined by group A or B of this Code, advice is to be sought from the competent authorities of the port of unloading and of the flag state. The three competent authorities will set the preliminary suitable conditions for the carriage of this cargo.

1.3.1.2 When it is assessed that the solid bulk cargo proposed for carriage presents no specific hazards for transportation, the carriage of this cargo will be authorized. The competent authorities of the port of unloading and of the flag State will be advised of that authorization.

1.3.2 The competent authority of the port of loading will provide to the master a certificate stating the characteristics of the cargo and the required conditions for carriage and handling of this shipment. The competent authority of the port of loading will also submit an application to the Organization, within one year from the issue of the certificate, to incorporate this solid bulk cargo into annex 1 of this Code. The format of this application will be as outlined in subsection 1.3.3.

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

Tentative Bulk Cargo Shipping Name (in capital letters)

**DESCRIPTION** (Describe the cargo)

**CHARACTERISTICS** (fill the following table)

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
SIZE	CLASS	GROUP

**HAZARD** (Clarify the hazard of carriage of the cargo.)

(Determine the following types of requirements. If no requirement is necessary, write "No special requirements".)

#### **STOWAGE & SEGREGATION**

#### HOLD CLEANLINESS

WEATHER PRECAUTIONS

LOADING

#### PRECAUTIONS

#### VENTILATION

#### CARRIAGE

#### DISCHARGE

#### **CLEAN-UP**

(Specify the emergency procedures for the cargo, if necessary.)

#### **EMERGENCY PROCEDURES**

#### SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

#### **EMERGENCY PROCEDURES**

## EMERGENCY ACTION IN THE EVENT OF FIRE

#### MEDICAL FIRST AID

#### **1.4** Application and Implementation of this Code

The provisions contained in this Code apply to all ships to which the SOLAS Convention, as amended, applies and which are carrying solid bulk cargoes as defined in regulation 2 of part A of chapter VI of the Convention.

Although this Code is legally treated as a mandatory instrument under the SOLAS Convention the following provisions of this Code remain recommendatory or informative:

- Section 11 Security provisions (except subsection 11.1.1);
- Section 12 Stowage factor conversion tables;
- Section 13 References to related information and recommendations;

Appendices other than appendix 1 "Individual schedules of solid bulk cargoes"; and

The texts in the sections for "DESCRIPTION", "CHARACTERISTICS", "HAZARDS" and "EMERGENCY PROCEDURES" of individual schedules of solid bulk cargoes in appendix 1.

#### **1.5** Exemptions and Equivalent measures

1.5.1 Where this Code requires that a particular provision for the transport of solid bulk cargoes shall be complied with, a competent authority or competent authorities (port State of departure, port State of arrival or flag State) may authorize any other provision by exemption if satisfied that such provision is at least as effective and safe as that required by this Code. Acceptance of an exemption authorized under this section by a competent authority not party to it is subject to the discretion of that competent authority. Accordingly, prior to any shipment covered by the exemption, the recipient of the exemption shall notify other competent authorities concerned.

1.5.2 Competent authority or competent authorities which have taken the initiative with respect to the exemption:

- .1 shall send a copy of such exemption to the Organization which shall bring it to the attention of the Contracting Parties to SOLAS, and
- .2 shall take action to amend this Code to include the provisions covered by the exemption, as appropriate.

1.5.3 The period of validity of the exemption shall be not more than five years from the date of authorization. An exemption that is not covered under 1.5.2.2 may be renewed in accordance with the provisions of this section.

1.5.4 A copy of the exemption or an electronic copy thereof shall be maintained on board each ship transporting solid bulk cargoes in accordance with the exemption, as appropriate.

1.5.5 Contact information for the main designated national competent authorities concerned is given in the separate document issued by the Organization.

#### 1.6 Conventions

Parts A and B of chapter VI and part B of chapter VII of the SOLAS Convention, as amended, deal with the carriage of solid bulk cargoes and the carriage of dangerous good in solid form in bulk, respectively, and are reproduced in full:

# CHAPTER VI

#### **CARRIAGE OF CARGOES**

#### Part A

#### **General provisions**

# **Regulation 1** *Definitions*

For the purpose of this chapter, unless expressly provided otherwise:

1 *IMSBC Code* means the International Maritime Solid Bulk Cargoes Code adopted by the Maritime Safety Committee of the Organization by resolution [MSC... (85)], as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I.

2 *Solid bulk cargo* means any cargo, other than liquid or gas, consisting of a combination of particles, granules or any larger pieces of material generally uniform in composition, which is loaded directly into the cargo spaces of a ship without any intermediate form of containment.

## **Regulation 2**

Application

1 This chapter applies to the carriage of cargoes (except liquids in bulk, gases in bulk and those aspects of carriage covered by other chapters) which, owing to their particular hazards to ships or persons on board, may require special precautions in all ships to which the present regulations apply and in cargo ships of less than 500 gross tonnage. However, for cargo ships of less than 500 gross tonnage, the Administration, if it considers that the sheltered nature and conditions of voyage are such as to render the application of any specific requirements of part A or B of this chapter unreasonable or unnecessary, may take other effective measures to ensure the required safety for these ships.

2 To supplement the provisions of parts A and B of this chapter, each Contracting Government shall ensure that appropriate information on cargo and its stowage and securing is provided, specifying, in particular, precautions necessary for the safe carriage of such cargoes.<sup>\*</sup>

## **Regulation 3**

Requirements for the carriage of solid bulk cargoes other than grain

The carriage of solid bulk cargoes other than grain shall be in compliance with the relevant provisions of the IMSBC Code.

#### **Regulation 4**

Cargo information

1 The shipper shall provide the master or his representative with appropriate information on the cargo sufficiently in advance of loading to enable the precautions which may be necessary for proper stowage and safe carriage of the cargo to be put into effect. Such information<sup>\*\*</sup> shall be confirmed in writing<sup>\*\*\*</sup> and by appropriate shipping documents prior to loading the cargo on the ship.

Refer to:

<sup>.1</sup> the Code of Safe Practice for Cargo Stowage and Securing adopted by the Organization by resolution A.714(17), as amended;

<sup>.2</sup> the Code of Safe Practice for Ships Carrying Timber Deck Cargoes adopted by the Organization by resolution A.715(17), as amended; MSC/Circ.525, Guidance note on precautions to be taken by the masters of ships of below 100 metres in length engaged in the carriage of logs; and MSC/Circ.548, Guidance note on precautions to be taken by masters of ships engaged in the carriage of timber cargoes; and

<sup>.3</sup> the International Maritime Solid Bulk Cargoes (IMSBC) Code adopted by the Organization by resolution MSC.[...](85).

<sup>\*\*</sup> Refer to the Form for cargo information (MSC/Circ.663).

<sup>\*\*\*</sup> Reference to documents in this regulation does not preclude the use of electronic data processing (EDP) and electronic data interchange (EDI) transmission techniques as an aid to paper documentation.

- 2 The cargo information shall include:
  - .1 in the case of general cargo, and of cargo carried in cargo units, a general description of the cargo, the gross mass of the cargo or of the cargo units, and any relevant special properties of the cargo. For the purpose of this regulation the cargo information required in sub-chapter 1.9 of the Code of Safe Practice for Cargo Stowage and Securing, adopted by the Organization by resolution A.714(17), as may be amended, shall be provided. Any such amendment to sub-chapter 1.9 shall be adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I;
  - .2 in the case of solid bulk cargo, information as required by section 4 of the IMSBC Code.

3 Prior to loading cargo units on board ships, the shipper shall ensure that the gross mass of such units is in accordance with the gross mass declared on the shipping documents.

## **Regulation 5**

Oxygen analysis and gas detection equipment

1 When transporting a solid bulk cargo which is liable to emit a toxic or flammable gas, or cause oxygen depletion in the cargo space, an appropriate instrument for measuring the concentration of gas or oxygen in the air shall be provided together with detailed instructions for its use. Such an instrument shall be to the satisfaction of the Administration.

2 The Administration shall take steps to ensure that crews of ships are trained in the use of such instruments.

#### **Regulation 6**

*The use of pesticides in ships*<sup>\*</sup>

Appropriate precautions shall be taken in the use of pesticides in ships, in particular for the purposes of fumigation.

\* Refer to:

<sup>.1</sup> The Recommendations on the safe use of pesticides in ships (MSC/Circ.612, as amended);

<sup>.2</sup> The Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo holds (MSC.1/Circ.1264); and

<sup>.3</sup> The Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units (MSC.1/Circ.1265), as appropriate.

### **Regulation 7**

Stowage and securing

1 Cargo, cargo units<sup>\*</sup> and cargo transport units<sup>\*\*</sup> carried on or under deck shall be so loaded, stowed and secured as to prevent as far as is practicable, throughout the voyage, damage or hazard to the ship and the persons on board, and loss of cargo overboard.

2 Cargo, cargo units and cargo transport units shall be so packed and secured within the unit as to prevent, throughout the voyage, damage or hazard to the ship and the persons on board.

3 Appropriate precautions shall be taken during loading and transport of heavy cargoes or cargoes with abnormal physical dimensions to ensure that no structural damage to the ship occurs and to maintain adequate stability throughout the voyage.

4 Appropriate precautions shall be taken during loading and transport of cargo units and cargo transport units on board ro–ro ships, especially with regard to the securing arrangements on board such ships and on the cargo units and cargo transport units and with regard to the strength of the securing points and lashings.

5 Freight containers shall not be loaded to more than the maximum gross weight indicated on the Safety Approval Plate under the International Convention for Safe Containers (CSC), as amended.

6 All cargoes, other than solid and liquid bulk cargoes, cargo units and cargo transport units, shall be loaded, stowed and secured throughout the voyage in accordance with the Cargo Securing Manual approved by the Administration. In ships with ro–ro spaces, as defined in regulation II-2/3.41, all securing of such cargoes, cargo units, and cargo transport units, in accordance with the Cargo Securing Manual, shall be completed before the ship leaves the berth. The Cargo Securing Manual shall be drawn up to a standard at least equivalent to relevant guidelines developed by the Organization.<sup>\*\*\*</sup>

#### Part B

#### Special provisions for solid bulk cargoes

#### **Regulation 8**

Acceptability for shipment

1 Prior to loading a solid bulk cargo, the master shall be in possession of comprehensive information on the ship's stability and on the distribution of cargo for the

<sup>\*</sup> Refer to the Code of Safe Practice for Cargo Stowage and Securing, adopted by the Organization by resolution A.714(17), as amended.

<sup>\*\*</sup> Refer to the International Maritime Dangerous Goods (IMDG) Code, adopted by the Organization by resolution MSC.122(75).

<sup>\*\*\*</sup> Refer to the Guidelines on the preparation of the Cargo Securing Manual (MSC/Circ.745).

standard loading conditions. The method of providing such information shall be to the satisfaction of the Administration.\*

## **Regulation 9**

Loading, unloading and stowage of solid bulk cargoes\*\*

1 For the purpose of this regulation, terminal representative means a person appointed by the terminal or other facility, where the ship is loading or unloading, who has responsibility for operations conducted by that terminal or facility with regard to the particular ship.

2 To enable the master to prevent excessive stresses in the ship's structure, the ship shall be provided with a booklet, which shall be written in a language with which the ship's officers responsible for cargo operations are familiar. If this language is not English, the ship shall be provided with a booklet written also in the English language. The booklet shall, as a minimum, include:

- .1 stability data, as required by regulation II-1/22;
- .2 ballasting and deballasting rates and capacities;
- .3 maximum allowable load per unit surface area of the tank top plating;
- .4 maximum allowable load per hold;
- .5 general loading and unloading instructions with regard to the strength of the ship's structure including any limitations on the most adverse operating conditions during loading, unloading, ballasting operations and the voyage;
- .6 any special restrictions such as limitations on the most adverse operating conditions imposed by the Administration or organization recognized by it, if applicable; and
- .7 where strength calculations are required, maximum permissible forces and moments on the ship's hull during loading, unloading and the voyage.

<sup>\*</sup> Refer to:

<sup>.1</sup> the Recommendation on intact stability for passenger and cargo ships under 100 metres in length adopted by the Organization by resolution A.167(ES.IV) and to amendments to this Recommendation adopted by the Organization by resolution A.206(VII); and

<sup>.2</sup> the Recommendation on a severe wind and rolling criterion (weather criterion) for the intact stability of passenger and cargo ships of 24 metres in length and over adopted by the Organization by resolution A.562(14).

<sup>&</sup>lt;sup>\*\*</sup> Refer to the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) adopted by the Organization by resolution A.862(20).
3 Before a solid bulk cargo is loaded or unloaded, the master and the terminal representative shall agree on a plan<sup>\*</sup> which shall ensure that the permissible forces and moments on the ship are not exceeded during loading or unloading, and shall include the sequence, quantity and rate of loading or unloading, taking into consideration the speed of loading or unloading, the number of pours and the deballasting or ballasting capability of the ship. The plan and any subsequent amendments thereto shall be lodged with the appropriate authority of the port State.

4 The master and terminal representative shall ensure that loading and unloading operations are conducted in accordance with the agreed plan.

5 If during loading or unloading any of the limits of the ship referred to in paragraph 2 are exceeded or are likely to become so if the loading or unloading continues, the master has the right to suspend operation and the obligation to notify accordingly the appropriate authority of the port State with which the plan has been lodged. The master and the terminal representative shall ensure that corrective action is taken. When unloading cargo, the master and terminal representative shall ensure that the unloading method does not damage the ship's structure.

6 The master shall ensure that ship's personnel continuously monitor cargo operations. Where possible, the ship's draught shall be checked regularly during loading or unloading to confirm the tonnage figures supplied. Each draught and tonnage observation shall be recorded in a cargo log-book. If significant deviations from the agreed plan are detected, cargo or ballast operations or both shall be adjusted to ensure that the deviations are corrected.

# CHAPTER VII

#### **Carriage of dangerous goods**

#### Part B

Carriage of dangerous goods in solid form in bulk

# **Regulation 7** *Definitions*

*Dangerous goods in solid form in bulk* means any material, other than liquid or gas, consisting of a combination of particles, granules or any larger pieces of material, generally uniform in composition, which is covered by the IMDG Code and is loaded directly into the cargo spaces of a ship without any intermediate form of containment, and includes such materials loaded in a barge on a barge-carrying ship.

<sup>\*</sup> Refer to the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) adopted by the Organization by resolution A.862(20).

# **Regulation 8**

Application<sup>\*</sup>

1 Unless expressly provided otherwise, this part applies to the carriage of dangerous goods in solid form in bulk in all ships to which the present regulations apply and in cargo ships of less than 500 gross tonnage.

2 The carriage of dangerous goods in solid form in bulk is prohibited except in accordance with the provisions of this part.

3 To supplement the provisions of this part, each Contracting Government shall issue, or cause to be issued, instructions on emergency response and medical first aid relevant to incidents involving dangerous goods in solid form in bulk, taking into account the guidelines developed by the Organization.<sup>\*\*</sup>

# **Regulation 9**

Requirements for the carriage of dangerous goods in solid form in bulk

The carriage of dangerous goods in solid form in bulk shall be in compliance with the relevant provisions of the IMSBC Code, as defined in regulation VI/1.1.

# **Regulation 10**

Documents

1 In all documents relating to the carriage of dangerous goods in solid form in bulk by sea, the bulk cargo shipping name of the goods shall be used (trade names alone shall not be used).

2 Each ship carrying dangerous goods in solid form in bulk shall have a special list or manifest setting forth the dangerous goods on board and the location thereof. A detailed stowage plan, which identifies by class and sets out the location of all dangerous goods on board, may be used in place of such a special list or manifest. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.

# **Regulation 11**

Stowage and segregation requirements

1 Dangerous goods in solid form in bulk shall be loaded and stowed safely and appropriately in accordance with the nature of the goods. Incompatible goods shall be segregated from one another.

2 Dangerous goods in solid form in bulk, which are liable to spontaneous heating or combustion, shall not be carried unless adequate precautions have been taken to minimize the likelihood of the outbreak of fire.

<sup>\*</sup> Refer to regulation II-2/19, which contains special requirements for ship carrying dangerous goods.

<sup>\*\*</sup> Refer to the Medical First Aid Guide for Use in Accidents involving Dangerous Goods (MFAG) (MSC/Circ.857).

3 Dangerous goods in solid form in bulk, which give off dangerous vapours, shall be stowed in a well ventilated cargo space.

# **Regulation 12**

Reporting of incidents involving dangerous goods

1 When an incident takes place involving the loss or likely loss overboard of dangerous goods in solid form in bulk into the sea, the master, or other person having charge of the ship, shall report the particulars of such an incident without delay and to the fullest extent possible to the nearest coastal State. The report shall be drawn up based on general principles and guidelines developed by the Organization.<sup>\*</sup>

2 In the event of the ship referred to in paragraph 1 being abandoned, or in the event of a report from such a ship being incomplete or unobtainable, the company, as defined in regulation IX/1.2, shall, to the fullest extent possible, assume the obligations placed upon the master by this regulation.

# 1.7 Definitions

For the purpose of this Code, unless expressly provided otherwise, the following definitions shall apply:

1.7.1 *Angle of repose* means the maximum slope angle of non-cohesive (i.e., free-flowing) granular material. It is measured as the angle between a horizontal plane and the cone slope of such material.



1.7.2 *Bulk Cargo Shipping Name (BCSN)* identifies a bulk cargo during transport by sea. When a cargo is listed in this Code, the Bulk Cargo Shipping Name of the cargo is identified by capital letters in the individual schedules or in the index. When the cargo is a dangerous good, as defined in the IMDG Code, as defined in regulation VII/1.1 of the SOLAS Convention, the Proper Shipping Name of that cargo is the Bulk Cargo Shipping Name.

1.7.3 *Bulk density* means the weight of solids, air and water per unit volume. Bulk density is expressed in kilograms per cubic metre  $(kg/m^3)$ , in general. The void spaces in the cargo may be filled with air and water.

1.7.4 *Cargo space* means any space in a ship designated for carriage of cargoes.

<sup>\*</sup> Refer to the General principles for ship reporting systems and ship reporting requirements, including Guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants, adopted by the Organization by resolution A.851(20).

1.7.5 *Cargoes which may liquefy* means cargoes which contain a certain proportion of fine particles and a certain amount of moisture. They may liquefy if shipped with a moisture content in excess of their transportable moisture limit.

1.7.6 *Cohesive material* means materials other than non-cohesive materials.

1.7.7 *Competent Authority* means any national regulatory body or authority designated or otherwise recognized as such for any purpose in connection with this Code.

1.7.8 *Concentrates* means materials obtained from a natural ore by a process of enrichment or beneficiation by physical or chemical separation and removal of unwanted constituents.

1.7.9 *Consignment* means a solid bulk cargo presented by a shipper for transport.

1.7.10 *Flow moisture point* means the percentage moisture content (wet mass basis) at which a flow state develops under the prescribed method of test in a representative sample of the material (see paragraph 1 of appendix 2).

1.7.11 *Flow state* means a state occurring when a mass of granular material is saturated with liquid to an extent that, under the influence of prevailing external forces such as vibration, impaction or ships motion, it loses its internal shear strength and behaves as a liquid.

1.7.12 *Group A* consists of cargoes which may liquefy if shipped at a moisture content in excess of their transportable moisture limit.

1.7.13 *Group B* consists of cargoes which possess a chemical hazard which could give rise to a dangerous situation on a ship.

1.7.14 *Group C* consists of cargoes which are neither liable to liquefy (Group A) nor to possess chemical hazards (Group B).

1.7.15 *High-density solid bulk cargo* means a solid bulk cargo with a stowage factor of  $0.56 \text{ m}^3/t$  or less.

1.7.16 *IMDG Code* means the International Maritime Dangerous Goods (IMDG) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC.122(75), as may be amended by the Organization.

1.7.17 *Incompatible materials* means materials that may react dangerously when mixed. They are subject to the segregation requirements of subsection 9.3 and the schedules for individual cargoes classified in Group B.

1.7.18 *International Ship and Port Facility Security (ISPS) Code* means the International Code for the Security of Ships and of Port Facilities consisting of Part A (the provisions of which shall be treated as mandatory) and part B (the provisions of which shall be treated as recommendatory), as adopted, on 12 December 2002, by resolution 2 of the Conference of Contracting Governments to the International Convention for the Safety of Life at Sea, 1974 as may be amended by the Organization.

1.7.19 *Materials hazardous only in bulk (MHB)* means materials which may possess chemical hazards when carried in bulk other than materials classified as dangerous goods in the IMDG Code.

1.7.20 *Moisture content* means that portion of a representative sample consisting of water, ice or other liquid expressed as a percentage of the total wet mass of that sample.

1.7.21 *Moisture migration* means the movement of moisture contained in a cargo by settling and consolidation of the cargo due to vibration and ship's motion. Water is progressively displaced, which may result in some portions or all of the cargo developing a flow state.

1.7.22 *Non-cohesive material* means dry materials that readily shift due to sliding during transport, as listed in appendix 3, paragraph 1, "Properties of dry bulk cargoes".

1.7.23 *Representative test sample* means a sample of sufficient quantity for the purpose of testing the physical and chemical properties of the consignment to meet specified requirements.

1.7.24 *Shipper* means any person by whom or in whose name, or on whose behalf, a contract of carriage of goods by sea has been concluded with a carrier, or any person by whom or in whose name, or on whose behalf, the goods are actually delivered to the carrier in relation to the contract of carriage by sea.

1.7.25 *Solid bulk cargo* means any cargo, other than a liquid or a gas, consisting of a combination of particles, granules or any larger pieces of material generally uniform in composition which is loaded directly into the cargo spaces of a ship without any intermediate form of containment.

1.7.26 *Stowage factor* means the figure which expresses the number of cubic metres which one tonne of cargo will occupy.

1.7.27 *Transportable Moisture Limit (TML) of a cargo which may liquefy* means the maximum moisture content of the cargo which is considered safe for carriage in ships not complying with the special provisions of subsection 7.3.2. It is determined by the test procedures, approved by a competent authority, such as those specified in paragraph 1 of appendix 2.

1.7.28 *Trimming* means any levelling of a cargo within a cargo space, either partial or total.

1.7.29 *Ventilation* means exchange of air from outside to inside a cargo space.

- .1 *Continuous Ventilation* means ventilation that is operating at all times.
- .2 *Mechanical Ventilation* means power-generated ventilation.
- .3 *Natural Ventilation* means ventilation that is not power-generated.
- .4 *Surface Ventilation* means ventilation of the space above the cargo.

#### General loading, carriage and unloading precautions

#### 2.1 Cargo distribution

#### 2.1.1 General

A number of accidents have occurred as a result of improper loading and unloading of solid bulk cargoes. It shall be noted that solid bulk cargoes have to be properly distributed throughout the ship to provide adequate stability and to ensure that the ship's structure is never overstressed. Furthermore, the shipper shall provide the master with adequate information about the cargo, as specified in section 4, to ensure that the ship is properly loaded. Further guidance is found in the other Code developed by the Organization

\* Refer to the Code of Practice for the Safe Loading and Unloading of Bulk Carriers, adopted by the Organization by resolution A.862(20), as amended.

#### 2.1.2 To prevent the structure being overstressed

A general cargo ship is normally constructed to carry cargoes in the range of 1.39 to 1.67 cubic metres per tonne when loaded to full bale and deadweight capacities. When loading a high-density solid bulk cargo, particular attention shall be paid to the distribution of weights to avoid excessive stresses, taking into account that the loading conditions may be different from those found normally and that improper distribution of such cargo may be capable of stressing either the structure under the load or the entire hull. To set out exact rules for the distribution of loading is not practicable for all ships because the structural arrangements of each vessel may vary greatly. The information on proper distribution of cargo may be provided in the ship's stability information booklet or may be obtained by the use of loading calculators, if available.

#### 2.1.3 To aid stability

2.1.3.1 Having regard to regulation II-1/22.1 of SOLAS Convention, a stability information booklet shall be provided aboard all ships subject to the Convention. The master shall be able to calculate the stability for the anticipated worst conditions during the voyage as well as that on departure and demonstrate that the stability is adequate.

2.1.3.2 Shifting divisions and bins, of adequate strength, shall be erected whenever solid bulk cargoes, which are suspected of readily shifting, are carried in 'tween-deck cargo spaces or in only partially filled cargo spaces.

2.1.3.3 As far as practicable, high-density cargoes shall normally be loaded in the lower hold cargo spaces in preference to 'tween-deck cargo spaces.

2.1.3.4 When it is necessary to carry high-density cargoes in 'tween-decks or higher cargo spaces, due consideration shall be paid to ensure that the deck area is not overstressed and that the ship's stability is not reduced below the minimum acceptable level specified in the ship's stability data.

#### 2.2 Loading and unloading

2.2.1 Cargo spaces shall be inspected and prepared for the particular cargo which is to be loaded. Guidance on bulk carrier inspections is contained in recommendations published by the Organization.\*

\* Refer to the Guidance to Ships' Crews and Terminal Personnel for Bulk Carrier Inspections, adopted by the Organization by resolution A.866(20).

2.2.2 Due consideration shall be paid to bilge wells and strainer plates, for which special preparation is necessary, to facilitate drainage and to prevent entry of the cargoes into the bilge system.

2.2.3 Bilge lines, sounding pipes and other service lines within the cargo space shall be in good order.

2.2.4 Because of the velocity at which some high-density solid bulk cargoes are loaded, special care may be necessary to protect cargo space fittings from damage. To sound bilges after the completion of loading may be effective to detect damage on cargo space fittings.

2.2.5 As far as practicable ventilation systems shall be shut down or screened and air conditioning systems placed on recirculation during loading or discharge, to minimize dust ingress into the living quarters or other interior spaces.

2.2.6 Due consideration shall be paid to minimize the extent to which dust may come into contact with moving parts of deck machinery and external navigational aids.

#### Safety of personnel and ship

#### **3.1** General requirements

3.1.1 Prior to and during loading, carriage and discharge of a solid bulk cargo, all necessary safety precautions shall be observed.

3.1.2 A copy of the instructions on emergency response and medical first aid<sup>\*</sup> relevant to incidents involving dangerous goods in solid form in bulk shall be on board.

\* Reference information is provided in the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) (MSC/Circ.857), published by the Organization.

#### **3.2 Poisoning, corrosive and asphysiation hazards**

3.2.1 Some solid bulk cargoes are susceptible to oxidation, which may result in oxygen depletion, emission of toxic gases or fumes and self-heating. Some cargoes are not liable to oxidize but may emit toxic fumes, particularly when wet. There are also cargoes which, when wetted, are corrosive to skin, eyes and mucous membranes or to the ship's structure. When these cargoes are carried particular attention shall be paid to protection of personnel and the need for special precautions to be taken prior to loading and after unloading.

3.2.2 Appropriate attention shall be paid that cargo spaces and adjacent spaces may be depleted in oxygen or may contain toxic or asphyxiating gases, and that an empty cargo space or tank which has remained closed for some time may have insufficient oxygen to support life.

3.2.3 Many solid bulk cargoes are liable to cause oxygen depletion in a cargo space or tank. These include, but are not limited to, most vegetable products and forest products, ferrous metals, metal sulphide concentrates and coal cargoes.

3.2.4 Prior to entry into an enclosed space aboard a ship, appropriate procedures shall be followed taking into account the recommendations developed by the Organization<sup>\*</sup>. It is to be noted that, after a cargo space or tank has been tested and generally found to be safe for entry, small areas may exist where oxygen is deficient or toxic fumes are still present.

\* Refer to the "Recommendations for entering enclosed spaces aboard ships" adopted by the Organization by resolution A.864(20), as amended.

3.2.5 When carrying a solid bulk cargo which is liable to emit a toxic or flammable gas, and/or cause oxygen depletion in the cargo space, the appropriate instrument(s) for measuring the concentration of gas and oxygen in the cargo space shall be provided.

3.2.6 Emergency entry into a cargo space shall be undertaken only by trained personnel wearing self-contained breathing apparatus and protective clothing and always under the supervision of a responsible officer.

#### **3.3** Health hazards due to dust

To minimize the chronic and acute risks associated with exposure to the dust of some solid bulk cargoes, the need for a high standard of personal hygiene of those exposed to the dust cannot be over emphasized. Precautions, including the use of appropriate breathing protection, protective clothing, protective skin creams, adequate personal washing and laundering of outer clothing, shall be taken as necessary.

#### **3.4** Flammable atmosphere

3.4.1 Dust of some solid bulk cargoes may constitute an explosion hazard, especially while loading, unloading and cleaning. This risk can be minimized by ventilating to prevent the formation of a dust-laden atmosphere and by hosing down rather than sweeping.

3.4.2 Some cargoes may emit flammable gases in sufficient quantities to constitute a fire or explosion hazard. Where this is indicated in the cargo schedule in this Code or by the cargo information provided by the shipper, the cargo spaces shall be effectively ventilated as necessary. The atmosphere in the cargo spaces shall be monitored by means of an appropriate gas detector. Due consideration shall be paid to the ventilation and monitoring of the atmosphere in the enclosed spaces adjacent to the cargo spaces.

# 3.5 Ventilation

3.5.1 Unless expressly provided otherwise, when cargoes which may emit toxic gases are carried, the cargo spaces shall be provided with mechanical or natural ventilation; and, when cargoes which may emit flammable gases are carried, the cargo spaces shall be provided with mechanical ventilation.

3.5.2 If maintaining ventilation would endanger the ship or the cargo, it may be interrupted unless this would produce a risk of explosion.

3.5.3 When continuous ventilation is required by the schedule for the cargo in this Code or by the cargo information provided by the shipper, ventilation shall be maintained while the cargo is onboard, unless a situation develops where ventilation would endanger the ship.

3.5.4 Ventilation openings shall be provided in holds intended for the carriage of cargoes which require continuous ventilation. Such openings shall comply with the requirements of the Load Line Convention as amended for openings not fitted with means of closure.

3.5.5 Ventilation shall be such that any escaping hazardous gases, vapours or dust, cannot enter the accommodation or other interior spaces in hazardous concentrations. Due consideration shall be given to prevent escaping hazardous gases, vapours or dust from reaching enclosed work areas. Adequate precautions shall be taken to protect the personnel in these work areas.

3.5.6 When a cargo may heat spontaneously ventilation other than surface ventilation shall not be applied. On no account shall air be directed into the body of the cargo.

# 3.6 Cargo under in-transit fumigation

Fumigation shall be performed based on the recommendations developed by the Organization<sup>\*</sup>.

\* Refer to the Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo holds (MSC.1/Circ.1264).

#### Assessment of acceptability of consignments for safe shipment

#### 4.1 Identification and classification

4.1.1 Each solid bulk cargo in this Code has been assigned a Bulk Cargo Shipping Name (BCSN). When a solid bulk cargo is carried by sea it shall be identified in the transport documentation by the BCSN. The BCSN shall be supplemented with the United Nations (UN) number when the cargo is dangerous goods.

4.1.2 If waste cargoes are being transported for disposal, or for processing for disposal, the name of the cargoes shall be preceded by the word "WASTE".

4.1.3 Correct identification of a solid bulk cargo facilitates identification of the conditions necessary to safely carry the cargo and the emergency procedures, if applicable.

4.1.4 Solid bulk cargoes shall be classified, where appropriate, in accordance with the UN Manual of Tests and Criteria, part III. The various properties of a solid bulk cargo required by this Code shall be determined, as appropriate to that cargo, in accordance with the test procedures approved by a competent authority in the country of origin, when such test procedures exist. In the absence of such test procedures, those properties of a solid bulk cargo shall be determined, as appropriate to that cargo, in accordance with the test procedures exist. In the absence of such test procedures, those properties of a solid bulk cargo shall be determined, as appropriate to that cargo, in accordance with the test procedures prescribed in appendix 2 to this Code.

#### 4.2 **Provision of information**

4.2.1 The shipper shall provide the master or his representative with appropriate information on the cargo sufficiently in advance of loading to enable the precautions which may be necessary for proper stowage and safe carriage of the cargo to be put into effect.

4.2.2 Cargo information shall be confirmed in writing and by appropriate shipping documents prior to loading. The cargo information shall include:

- the BCSN when the cargo is listed in this Code. Secondary names may be used in addition to the BCSN;
- the cargo group (A&B, A, B, or C);
- the IMO Class of the cargo, if applicable;
- the UN number preceded by letters UN for the cargo, if applicable;
- the total quantity of the cargo offered;
- the stowage factor;
- the need for trimming and the trimming procedures, as necessary;

- the likelihood of shifting, including angle of repose, if applicable;
- additional information in the form of a certificate on the moisture content of the cargo and its transportable moisture limit in the case of a concentrate or other cargo which may liquefy;
- likelihood of formation of a wet base (see subsection 7.2.3 of this Code);
- toxic or flammable gases which may be generated by cargo, if applicable;
- flammability, toxicity, corrosiveness and propensity to oxygen depletion of the cargo, if applicable;
- self-heating properties of the cargo, and the need for trimming, if applicable;
- properties on emission of flammable gases in contact with water, if applicable;
- radioactive properties, if applicable; and
- any other information required by national authorities.

4.2.3 Information provided by the shipper shall be accompanied by a declaration. An example of a cargo declaration form is set out in the next page. The other form may be used for cargo declaration. As an aid to paper documentation, Electronic Data Processing (EDP) or Electronic Data Interchange (EDI) techniques may be used.

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# FORM FOR CARGO INFORMATION for Solid Bulk Cargoes

BCSN							
Shipper	Transport document Number						
Consignee	Carrier						
Name/means of transport	Instructions or other matters						
Port/place of departure							
Port/place of destination							
General description of the cargo (Type of material/particle size)*	Gross mass (kg/tonnes)						
Specifications of bulk cargo, if applicable: Stowage factor: Angle of repose, if applicable: Trimming procedures: Chemical properties if potential hazard <sup>*</sup> : * e.g., Class & UN No. or "MHB"							
Group of the cargo Group A & B* Group A* Group B Group C	<ul> <li>* For cargoes which may liquefy (Group A and Group A &amp; B cargoes)</li> <li>Transportable Moisture Limit</li> <li>Moisture content at shipment</li> </ul>						
Relevant special properties of the cargo (e.g., highly soluble in water)	Additional certificate(s)* Certificate of moisture content and transportable moisture limit Weathering certificate Exemption certificate Other (specify) * If required						
DECLARATION I hereby declare that the consignment is fully and accurately described and that the given test results and other specifications are correct to the best of my knowledge and belief and can be considered as representative for the cargo to be loaded.	Name/status, company/organization of signatory         Place and date         Signature on behalf of shipper						

#### 4.3 Certificates of test

4.3.1 To obtain the information required in 4.2.1 the shipper shall arrange for the cargo to be properly sampled and tested. The shipper shall provide the ship's master or his representative with the appropriate certificates of test, if required in this Code.

4.3.2 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. The certificate of TML shall contain, or be accompanied by the result of the test for determining the TML. The declaration of moisture content shall contain, or be accompanied by, a statement by the shipper that the moisture content is, to the best of his knowledge and belief, the average moisture content of the cargo at the time the declaration is presented to the master.

4.3.3 When a concentrate or other cargo which may liquefy is to be loaded into more than one cargo space of a ship, the certificate or the declaration of moisture content shall certify the moisture content of each type of finely grained material loaded into each cargo space. Notwithstanding this requirement, if sampling according to an internationally or nationally accepted standard procedures indicates that the moisture content is uniform throughout the consignment, then one certificate or declaration of average moisture content for all cargo spaces is acceptable.

4.3.4 Where certification is required by the individual schedules for cargoes possessing chemical hazards, the certificate shall contain, or be accompanied by, a statement from the shipper that the chemical characteristics of the cargo are, to the best of his knowledge, those present at the time of the ship's loading.

#### 4.4 Sampling procedures

4.4.1 Physical property tests on the consignment are meaningless unless they are conducted prior to loading on truly representative test samples.

4.4.2 Sampling shall be conducted only by persons who have been suitably trained in sampling procedures and who are under the supervision of someone who is fully aware of the properties of the consignment and also the applicable principles and practices of sampling.

4.4.3 Prior to taking samples, and within the limits of practicability, a visual inspection of the consignment which is to form the ship's cargo shall be carried out. Any substantial portions of material which appear to be contaminated or significantly different in characteristics or moisture content from the bulk of the consignment shall be sampled and analysed separately. Depending upon the results obtained in these tests, it may be necessary to reject those particular portions as unfit for shipment.

4.4.4 Representative samples shall be obtained by employing techniques which take the following factors into account:

- .1 the type of material;
- .2 the particle size distribution;

- .3 composition of the material and its variability;
- .4 the manner in which the material is stored, in stockpiles, rail wagons or other containers, and transferred or loaded by material-handling systems such as conveyors, loading chutes, crane grabs, etc.;
- .5 the chemical hazards (toxicity, corrosivity, etc.);
- .6 the characteristics which have to be determined: moisture content, TML, bulk density/stowage factor, angle of repose, etc.;
- .7 variations in moisture distribution throughout the consignment which may occur due to weather conditions, natural drainage, e.g., to lower levels of stockpiles or containers, or other forms of moisture migration; and
- .8 variations which may occur following freezing of the material.

4.4.5 Throughout the sampling procedures, utmost care shall be taken to prevent changes in quality and characteristics. Samples shall be immediately placed in suitable sealed containers which are properly marked.

4.4.6 Unless expressly provided otherwise, sampling for the test required by this Code shall follow an internationally or nationally accepted standard procedure.

# 4.5 Interval between sampling/testing and loading for TML and moisture content determination

4.5.1 A test to determine the TML of a solid bulk cargo shall be conducted within six months to the date of loading the cargo. Notwithstanding this provision, where the composition or characteristics of the cargo are variable for any reason, a test to determine the TML shall be conducted again after it is reasonably assumed that such variation has taken place.

4.5.2 Sampling and testing for moisture content shall be conducted as near as practicable to the time of loading. If there has been significant rain or snow between the time of testing and loading, check tests shall be conducted to ensure that the moisture content of the cargo is still less than its TML. The interval between sampling/testing and loading shall never be more than seven days.

4.5.3 Samples of frozen cargo shall be tested for the TML or the moisture content after the free moisture has completely thawed.

#### 4.6 Sampling procedures for concentrate stockpiles

4.6.1 It is not practicable to specify a single method of sampling for all consignments since the character of the material and the form in which it is available will affect the selection of the procedure to be used. In the absence of internationally or nationally accepted standard sampling procedures, the following sampling procedures for concentrate stockpiles may be used to determine the moisture content and the TML of mineral concentrates. These procedures are not intended to replace sampling procedures, such as the use of automatic sampling, that achieve equal or superior accuracy of either moisture content or TML.

4.6.2 Sub-samples are taken in a reasonably uniform pattern, where possible from a leveled stockpile.

4.6.3 A plan of the stockpile is drawn and divided into areas, each of which contains approximately 125 t, 250 t or 500 t depending on the amount of concentrate to be shipped. Such a plan will indicate the number of sub-samples required and where each is to be taken. Each sub-sample taken is drawn from approximately 50 cm below the surface of the designated area.

4.6.4 The number of sub-samples and sample size are given by the competent authority or determined in accordance with the following scale:

Consignments of not more than 15,000 t:

One 200 g sub-sample is taken for each 125 t to be shipped.

Consignments of more than 15,000 but not more than 60,000 t:

One 200 g sub-sample is taken for each 250 t to be shipped.

Consignments of more than 60,000 t:

One 200 g sub-sample is taken for each 500 t to be shipped.

4.6.5 Sub-samples for moisture content determination are placed in sealed containers (such as plastic bags, cans, or small metallic drums) immediately on withdrawal for conveyance to the testing laboratory, where they are thoroughly mixed in order to obtain a fully representative sample. Where testing facilities are not available at the testing site, such mixing is done under controlled conditions at the stockpile and the representative sample placed in a sealed container and shipped to the test laboratory.

4.6.6 Basic procedural steps include:

- .1 identification of consignment to be sampled;
- .2 determination of the number of individual sub-samples and representative samples, as described in 4.6.4, which are required;
- .3 determination of the positions from which to obtain sub-samples and the method of combining such sub-samples to arrive at a representative sample;
- .4 gathering of individual sub-samples and placing them in sealed containers;
- .5 thorough mixing of sub-samples to obtain the representative sample; and
- .6 placing the representative sample in a sealed container if it has to be shipped to a test laboratory.

#### 4.7 Examples of standardized sampling procedures, for information

ISO 3082: 1998	-	Iron ores – Sampling and sample preparation procedures
ISO 1988: 1975	-	Hard coal – Sampling
ASTMD2234-99	-	Standard Practice for Collection of a Gross Sample of Coal
Australian Standards	8	
AS 4264.1	-	Coal and Coke-Sampling Part 1: Higher rank coal – Sampling Procedures
AS 1141 – Series	-	Methods of sampling and testing aggregates
BS.1017:1989	-	Methods of sampling coal and coke
BS 1017	-	British Standard Part 1: 1989 methods of sampling of coal
BS 1017	-	British Standard Part 2: 1994 methods of sampling of coal

Canadian Standard Sampling Procedure for Concentrate Stockpiles European Communities Method of Sampling for the Control of Fertilizers

JIS M 8100	-	Japanese General Rules for Methods of Sampling Bull	k
JIS M 8100: 1992	-	Materials Particulate cargoes – General Rules for Methods of Sampling	f

Polish Standard Sampling Procedure for:

Iron and Manganese Ores – Ref. No. PN-67/H-04000

Non-ferrous Metals - Ref. No. PN-70/H-04900

Russian Federation Standard Sampling Procedure for the Determination of Moisture Content in Ore Concentrates.

#### 4.8 Documentation required on board the ship carrying dangerous goods

4.8.1 Each ship carrying dangerous goods in solid form in bulk shall have a special list or manifest setting forth the dangerous goods on board and the location thereof, in accordance with SOLAS regulation VII/10.2. A detailed stowage plan, which identifies by class and sets out the location of all dangerous goods on board, may be used in place of such a special list or manifest.

4.8.2 When dangerous goods in solid form in bulk are carried appropriate instructions on emergency response to incidents involving the cargoes shall be on board.

4.8.3 Cargo ships of 500 gross tonnage and over constructed on or after 1 September 1984 and cargo ships of less than 500 gross tonnage constructed on or after 1 February 1992, subject to SOLAS regulation II-2/19.4 (or II-2/54.3), shall have a Document of Compliance when carrying dangerous goods in solid form in bulk except class 6.2 and class 7.

#### **Trimming procedures**

#### 5.1 General provisions for trimming

5.1.1 Trimming a cargo reduces the likelihood of the cargo shifting and minimizes the air entering the cargo, which could lead to spontaneous heating. To minimize these risks, cargoes shall be trimmed reasonably level, as necessary.

5.1.2 Cargo spaces shall be as full as practicable without resulting in excessive loading on the bottom structure or 'tween-deck to prevent sliding of a solid bulk cargo. Due consideration shall be given to the amount of a solid bulk cargo in each cargo space, taking into account the possibility of shifting and longitudinal moments and forces of the ship. Cargo shall be spread as widely as practicable to the boundary of the cargo space. Alternate hold loading restrictions, as required by SOLAS chapter XII, may also need to be taken into account.

5.1.3 The Master has the right to require that the cargo be trimmed level, where there is any concern regarding stability based upon the information available, taking into account the characteristics of the ship and the intended voyage.

#### 5.2 Special provisions for multi-deck ships

5.2.1 When a solid bulk cargo is loaded only in lower cargo spaces, it shall be trimmed sufficiently to equalize the mass distribution on the bottom structure.

5.2.2 When solid bulk cargoes are carried in 'tween-decks, the hatchways of such 'tween-decks shall be closed in those cases where the loading information indicates an unacceptable level of stress of the bottom structure if the hatchways are left open. The cargo shall be trimmed reasonably level and shall either extend from side to side or be secured by additional longitudinal divisions of sufficient strength. The safe load-carrying capacity of the 'tween-decks shall be observed to ensure that the deck structure is not overloaded.

5.2.3 If coal cargoes are carried in 'tween decks, the hatchways of such 'tween-decks shall be tightly sealed to prevent air moving up through the body of the cargo in the 'tween decks.

#### 5.3 Special provisions for cohesive bulk cargoes

5.3.1 All damp cargoes and some dry ones possess cohesion. For cohesive cargoes, the general provisions in subsection 5.1 shall apply.

5.3.2 The angle of repose is not an indicator of the stability of a cohesive bulk cargo and it is not included in the individual schedules for cohesive cargoes.

#### 5.4 Special provisions for non-cohesive bulk cargoes

5.4.1 Non-cohesive bulk cargoes are those listed in paragraph 1 in appendix 3 and any other cargo not listed in the appendix exhibiting the properties of a non-cohesive material.

5.4.2 For trimming purposes, solid bulk cargoes can be categorized as cohesive or non-cohesive. The angle of repose is a characteristic of non-cohesive bulk cargoes which is indicative of cargo stability and has been included in the individual schedules for non-cohesive cargoes. The angle of repose of the cargoes shall establish which provisions of this section apply. Methods for determining the angle of repose are given in section 6.

5.4.3 Non-cohesive bulk cargoes having an angle of repose less than or equal to 30°.

These cargoes, which flow freely like grain, shall be carried according to the provisions applicable to the stowage of grain cargoes<sup>\*</sup>. The bulk density of the cargo shall be taken into account when determining:

- .1 the scantlings and securing arrangements of divisions and bin bulkheads; and
- .2 the stability effect of free cargo surfaces.
- \* Reference is made to chapter VI of the SOLAS Convention, and the International Code for the Safe Carriage of Grain in Bulk adopted by the Maritime Safety Committee of the Organization by resolution MSC.23(59).
- 5.4.4 Non-cohesive bulk cargoes having an angle of repose greater than 30° to 35° inclusive.

These cargoes shall be trimmed according to the following criteria:

- .1 the unevenness of the cargo surface measured as the vertical distance ( $\Delta h$ ) between the highest and lowest levels of the cargo surface shall not exceed B/10, where B is the beam of the ship in metres, with a maximum allowable  $\Delta h = 1.5$  m; or
- .2 loading is carried out using trimming equipment approved by the competent authority.
- 5.4.5 Non-cohesive bulk cargoes having an angle of repose greater than 35°.

These cargoes shall be trimmed according to the following criteria:

- .1 the unevenness of the cargo surface measured as the vertical distance ( $\Delta$ h) between the highest and lowest levels of the cargo surface shall not exceed B/10, where B is the beam of the ship in metres, with a maximum allowable  $\Delta$ h = 2m; or
- .2 loading is carried out using trimming equipment approved by the competent authority.

#### Methods of determining the angle of repose

#### 6.1 General

An angle of repose of a non-cohesive solid bulk material shall be measured by a method approved by the appropriate authority as required by section 4.1.4 of this Code.

#### 6.2 Recommended test methods

There are various methods in use to determine the angle of repose for non-cohesive solid bulk materials. The recommended test methods are listed below:

#### 6.2.1 Tilting box method

This laboratory test method is suitable for non-cohesive granular materials with a grain size not greater than 10 mm. A full description of the equipment and procedure is given in subsection 2.1 of appendix 2.

#### 6.2.2 Shipboard test method

In the absence of a tilting box apparatus, an alternative procedure for determining the approximate angle of repose is given in subsection 2.2 of appendix 2.

#### Cargoes which may liquefy

#### 7.1 Introduction

7.1.1 The purpose of this section is to bring to the attention of Masters and others with responsibilities for the loading and carriage of bulk cargoes, the risks associated with liquefaction and the precautions to minimize the risk. Such cargoes may appear to be in a relatively dry granular state when loaded, and yet may contain sufficient moisture to become fluid under the stimulus of compaction and the vibration which occurs during a voyage.

7.1.2 A ship's motion may cause a cargo to shift sufficiently to capsize the vessel. Cargo shift can be divided into two types, namely, sliding failure or liquefaction consequence. Trimming the cargo in accordance with section 5 can prevent sliding failure.

7.1.3 Some cargoes which may liquefy may also heat spontaneously.

#### 7.2 Conditions for hazards

7.2.1 Group A cargoes contain a certain proportion of small particles and a certain amount of moisture. Group A cargoes may liquefy during a voyage even when they are cohesive and trimmed level. Liquefaction can result in cargo shift. This phenomenon may be described as follows:

- .1 the volume of the spaces between the particles reduces as the cargo is compacted owing to the ship motion, etc.;
- .2 the reduction in space between cargo particles causes an increase in water pressure in the space; and
- .3 the increase in water pressure reduces the friction between cargo particles resulting in a reduction in the shear strength of the cargo.
- 7.2.2 Liquefaction does not occur when one of the following conditions is satisfied:
  - .1 the cargo contains very small particles. In this case particle movement is restricted by cohesion and the water pressure in spaces between cargo particles does not increase;
  - .2 the cargo consists of large particles or lumps. Water passes through the spaces between the particles and there is no increase in the water pressure. Cargoes which consist entirely of large particles will not liquefy;
  - .3 the cargo contains a high percentage of air and low moisture content. Any increase in the water pressure is inhibited. Dry cargoes are not liable to liquefy.

7.2.3 A cargo shift caused by liquefaction may occur when the moisture content exceeds the TML. Some cargoes are susceptible to moisture migration and may develop a dangerous wet base even if the average moisture content is less than the TML. Although the cargo surface may

appear dry undetected liquefaction may take place resulting in shifting of the cargo. Cargoes with high moisture content are prone to sliding particularly when the cargo is shallow and subject to large heel angles.

7.2.4 In the resulting viscous fluid state cargo may flow to one side of the ship with a roll but not completely return with a roll the other way. Consequently the ship may progressively reach a dangerous heel and capsize quite suddenly.

#### 7.3 **Provisions for cargoes which may liquefy**

#### 7.3.1 General

7.3.1.1 Concentrates or other cargoes which may liquefy shall only be accepted for loading when the actual moisture content of the cargo is less than its TML. Notwithstanding this provision, such cargoes may be accepted for loading on specially constructed or fitted cargo ships even when their moisture content exceeds the TML.

7.3.1.2 Cargoes which contain liquids other than packaged canned goods or the like shall not be stowed in the same cargo space above or adjacent to these solid bulk cargoes.

7.3.1.3 Adequate measures shall be taken to prevent liquids entering the cargo space in which these solid bulk cargoes are stowed during the voyage.

7.3.1.4 Masters shall be cautioned about the possible danger of using water to cool these cargoes while the ship is at sea. Introducing water may bring the moisture content of these cargoes to a flow state. When necessary, due regard shall be paid to apply water in the form of a spray.

#### 7.3.2 Specially constructed or fitted cargo ships

7.3.2.1 Cargoes having a moisture content in excess of the TML shall only be carried in specially constructed cargo ships or in specially fitted cargo ships.

7.3.2.2 Specially constructed cargo ships shall have permanent structural boundaries, so arranged as to confine any shift of cargo to an acceptable limit. The ship concerned shall carry evidence of approval by the Administration.

7.3.2.3 Specially fitted cargo ships shall be fitted with specially designed portable divisions to confine any shift of cargo to an acceptable limit. Specially fitted cargo ships shall be in compliance with the following requirement:

- .1 The design and positioning of such special arrangements shall adequately provide not only the restraint of the immense forces generated by the flow movement of high-density bulk cargoes, but also for the need to reduce to an acceptable safe level the potential heeling movements arising out of a transverse cargo flow across the cargo space. Divisions provided to meet these requirements shall not be constructed of wood.
- .2 The elements of the ship's structure bounding such cargo shall be strengthened, as necessary.

- .3 The plan of special arrangements and details of the stability conditions on which the design has been based shall have been approved by the Administration. The ship concerned shall carry evidence of approval by the Administration.
- 7.3.2.4 A submission made to an Administration for approval of such a ship shall include:
  - .1 relevant structural drawings, including scaled longitudinal and transverse sections;
  - .2 stability calculations, taking into account loading arrangements and possible cargo shift, showing the distribution of cargo and liquids in tanks, and of cargo which may become fluid; and
  - .3 any other information which may assist the Administration in the assessment of the submission.

#### Test procedures for cargoes which may liquefy

#### 8.1 General

For a Group A cargo, the actual moisture content and transportable moisture limit shall be determined in accordance with a procedure determined by the appropriate authority as required by section 4.1.4 of this Code, unless the cargo is carried in a specially constructed or fitted ship.

#### 8.2 Test procedures for measurement of moisture content

There are recognized international and national methods for determining moisture content for various materials. Reference is made in paragraph 1.1.4.4 of appendix 2.

#### 8.3 Methods for determining transportable moisture limit

The recommended methods for determining transportable moisture limit are given in appendix 2.

#### 8.4 Complementary test procedure for determining the possibility of liquefaction

A ship's master may carry out a check test for approximately determining the possibility of flow on board ship or at the dockside by the following auxiliary method:

Half fill a cylindrical can or similar container (0.5 to 1 litre capacity) with a sample of the material. Take the can in one hand and bring it down sharply to strike a hard surface such as a solid table from a height of about 0.2 m. Repeat the procedure 25 times at one or two second intervals. Examine the surface for free moisture or fluid conditions. If free moisture or a fluid condition appears, arrangements should be made to have additional laboratory tests conducted on the material before it is accepted for loading.

#### Materials possessing chemical hazards

#### 9.1 General

Solid bulk cargoes which may possess a chemical hazard during transport, because of their chemical nature or properties, are in Group B. Some of these materials are classified as dangerous goods and others are materials hazardous only in bulk (MHB). It is essential to obtain current, valid information about the physical and chemical properties of the cargoes to be shipped in bulk, prior to loading.

#### 9.2 Hazard classification

9.2.1 The classification of materials possessing chemical hazards and intended to be shipped in bulk under the requirements of this Code shall be in accordance with 9.2.2 and 9.2.3.

#### 9.2.2 Classification of dangerous goods

SOLAS regulation VII/7 defines dangerous goods in solid form in bulk. For the purpose of this Code, dangerous goods shall be classified in accordance with chapter 2 of the IMDG Code.

#### 9.2.2.1 Class 4.1: Flammable solids

The materials in this class are readily combustible solids and solids which may cause fire through friction.

#### 9.2.2.2 Class 4.2: Substances liable to spontaneous combustion

The materials in this class are materials, other than pyrophoric materials, which, in contact with air without energy supply, are liable to self-heating.

#### 9.2.2.3 Class 4.3: Substances which, in contact with water, emit flammable gases

The materials in this class are solids which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

#### 9.2.2.4 Class 5.1: Oxidizing substances

The materials in this class are materials while in themselves not necessarily combustible, may, generally by yielding oxygen cause, or contribute to, the combustion of other material.

#### 9.2.2.5 Class 6.1: Toxic substances

The materials in this class are materials liable either to cause death or serious injury or to harm human health if swallowed or inhaled, or by skin contact.

#### 9.2.2.6 Class 7: Radioactive materials

The materials in this class are any materials containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in 2.7.7.2.1 to 2.7.7.2.6 of the IMDG Code.

#### 9.2.2.7 Class 8: Corrosive substances

The materials in this class are materials which, by chemical action, will cause severe damage when in contact with living tissue or will materially damage, or even destroy, other goods or the means of transport.

#### 9.2.2.8 Class 9: Miscellaneous dangerous substances and articles

The materials in this class are materials and articles which, during transport, present a danger not covered by other classes.

#### 9.2.3 Materials hazardous only in bulk (MHB)

These are materials which may possess chemical hazards when transported in bulk other than dangerous goods.

#### 9.3 Stowage and segregation requirements

#### 9.3.1 General requirements

9.3.1.1 The potential hazards of the cargoes in Group B and falling within the classification of 9.2.2 and 9.2.3 entail the need for segregation of incompatible cargoes. Segregation shall also take account of any identified subsidiary risk.

9.3.1.2 In addition to general segregation as between whole classes of materials there may be a need to segregate a particular material from others. In the case of segregation from combustible materials this shall be understood not to include packaging material, ceiling or dunnage; the latter shall in these circumstances be kept to a minimum.

9.3.1.3 For the purpose of segregating incompatible materials, the words "hold" and "compartment" are deemed to mean a cargo space enclosed by steel bulkheads or shell plating and by steel decks. The boundaries of such a space shall be resistant to fire and liquid.

9.3.1.4 When two or more different solid bulk cargoes of Group B are to be carried, the segregation between them shall be in accordance with 9.3.4.

9.3.1.5 Where different grades of a solid bulk cargo are carried in the same cargo space, the most stringent segregation provisions applicable to any of the different grades shall apply to all of them.

9.3.1.6 When solid bulk cargoes of Group B and dangerous goods in packaged form are to be carried, the segregation between them shall be in accordance with 9.3.3.

9.3.1.7 Incompatible materials shall not be handled simultaneously. Upon completion of loading one such cargo, the hatch covers of every cargo space shall be closed and the decks cleaned of residue before the loading of other materials is commenced. When discharging, the same procedures shall be followed.

9.3.1.8 To avoid contamination, all foodstuffs shall be stowed:

- .1 "separated from" a material which is indicated as toxic;
- .2 "separated by a complete compartment or hold from" all infectious materials;
- .3 "separated from" radioactive materials; and
- .4 "away from" corrosive materials.

9.3.1.9 Materials which may evolve toxic gases in sufficient quantities to affect health shall not be stowed in those spaces from where such gases may penetrate into living quarters or ventilation systems connecting to living quarters.

9.3.1.10 Materials which present corrosive hazards of such intensity as to affect either human tissue or the ship's structure shall only be loaded after adequate precautions and protective measures have been taken.

9.3.1.11 After discharge of toxic or oxidizing cargoes, the spaces used for their carriage shall be inspected for contamination before being used for other cargoes. A space which has been contaminated shall be properly cleaned and examined before being used for other cargoes.

9.3.1.12 After discharge of cargoes, a close inspection shall be made for any residue which shall be removed before the ship is presented for other cargoes.

9.3.1.13 For cargoes for which in case of an emergency the hatches shall be opened, these hatches shall be kept free to be capable of being opened up.

9.3.2 Special requirements

#### 9.3.2.1 Materials of classes 4.1, 4.2 and 4.3

9.3.2.1.1 Materials of these classes shall be kept as cool and dry as reasonably practicable and, unless expressly provided otherwise in this Code, shall be stowed "away from" all sources of heat or ignition.

9.3.2.1.2 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.

9.3.2.1.3 Cargoes liable to give off vapours or gases which can form an explosive mixture with air shall be stowed in a mechanically ventilated space.

9.3.2.1.4 Prohibition of smoking in dangerous areas shall be enforced, and clearly legible "NO SMOKING" signs shall be displayed.

# 9.3.2.2 Materials of class 5.1

9.3.2.2.1 Cargoes of this class shall be kept as cool and dry as reasonably practicable and, unless expressly provided otherwise in this Code, shall be stowed "away from" all sources of heat or ignition. They shall also be stowed "separated from" other combustible materials.

9.3.2.2.2 Before loading cargoes of this class, particular attention shall be paid to the cleaning of the cargo spaces into which they will be loaded. As far as reasonably practicable, non-combustible securing and protecting materials shall be used and only a minimum of dry wooden dunnage shall be used.

9.3.2.2.3 Precautions shall be taken to avoid the penetration of oxidizing materials into other cargo spaces, bilges and other spaces which may contain a combustible material.

#### 9.3.2.3 Materials of class 7

9.3.2.3.1 Cargo spaces used for the transport of Low Specific Activity Materials (LSA-I) and Surface Contaminated Objects (SCO-I) shall not be used for other cargoes until decontaminated by a qualified person so that the non-fixed contamination on any surface when averaged over an area of  $300 \text{ cm}^2$  does not exceed the following levels:

4 Bq/cm<sup>2</sup> ( $10^{-4} \mu Ci/cm^2$ ) for beta and gamma emitters and the low-toxicity alpha emitters; natural uranium; natural thorium; uranium-235 or uranium-238; thorium-232; thorium-228 and thorium-230 when contained in ores, physical or chemical concentrates; radionuclides with a half-life of less than 10 days; and

0.4 Bq/cm<sup>2</sup> ( $10^{-5} \mu Ci/cm^2$ ) for all other alpha emitters.

#### 9.3.2.4 Materials of class 8 or materials having similar properties

9.3.2.4.1 These cargoes shall be kept as dry as reasonably practicable.

9.3.2.4.2 Prior to loading these cargoes attention shall be paid to the cleaning of the cargo spaces into which they will be loaded particularly to ensure that these spaces are dry.

9.3.2.4.3 Penetration of these materials into other cargo spaces, bilges, wells and between the ceiling boards shall be prevented.

9.3.2.4.4 Particular attention shall be paid to the cleaning of the cargo spaces after unloading, as residues of these cargoes may be highly corrosive to the ship's structure. Hosing down of the cargo spaces followed by careful drying shall be considered.

# 9.3.3 Segregation between bulk materials possessing chemical hazards and dangerous goods in packaged form

9.3.3.1 Unless otherwise required in this section or in the individual schedules, segregation between solid bulk cargoes of Group B and dangerous goods in packaged form shall be in accordance with the following table.

The Dangerous Goods List of the IMDG Code shall be consulted for additional requirements with regard to stowage and segregation of packaged dangerous goods.

	Dangerous goods in packaged form																
Bulk cargo (classified as dangerous goods)		1.1 1.2				2.2											
	Class	1.5	1.3	1.4	2.1	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7	8	9
Flammable solids	4.1	4	3	2	2	2	2	Х	1	Х	1	2	Х	3	2	1	Х
Substances liable to spontaneous combustion	4.2	4	3	2	2	2	2	1	X	1	2	2	1	3	2	1	X
Substances which, in contact with water, emit flammable	4.3	4	4	2	1	X	2	x	1	X	2	2	x	2	2	1	x
Oxidizing substances (agents)	5.1	4	4	2	2	X	2	1	2	2	X	2	1	3	1	2	X
Toxic substances	6.1	2	2	Х	Х	Х	Х	Х	1	Х	1	1	Х	1	Х	Х	Х
Radioactive materials	7	2	2	2	2	2	2	2	2	2	1	2	Х	3	Х	2	Х
Corrosive substances	8	4	2	2	1	Х	1	1	1	1	2	2	Х	3	2	Х	Х
Miscellaneous dangerous substances and articles	9	X	X	X	X	X	X	X	X	X	X	X	X	X	Х	X	X
Materials Hazardous only in Bulk (MHB)		X	X	X	X	X	X	X	X	X	X	X	X	3	X	X	X

Numbers relate to the following segregation terms:

1

- "Away from": Effectively segregated so that incompatible materials cannot interact dangerously in the event of an accident but may be carried in the same hold or compartment or on deck provided a minimum horizontal separation of 3 metres, projected vertically, is provided.
- 2 "Separated from": In different holds when stowed under deck. Provided an intervening deck is resistant to fire and liquid, a vertical separation, i.e., in different compartments, may be accepted as equivalent to this segregation.
- 3 "Separated by a complete compartment or hold from": Means either a vertical or a horizontal separation. If the decks are not resistant to fire and liquid, then only a longitudinal separation, i.e., by an intervening complete compartment, is acceptable.
- 4 "Separated longitudinally by an intervening complete compartment or hold from": Vertical separation alone does not meet this requirement.

Prohibited area 3m 3m







X Segregation, if any, is shown in the Dangerous Goods List of the IMDG Code or in the individual schedules in this Code.

# Legend

Reference bulk material



Packages containing incompatible goods

Deck resistant to liquid and fire

NOTE: Vertical lines represent transverse watertight bulkheads between cargo spaces.

#### 9.3.4 Segregation between solid bulk cargoes possessing chemical hazards

Unless otherwise required in this section or in the individual schedules for cargoes of Group B, segregation between solid bulk cargoes possessing chemical hazards shall be according to the following table:

Solid bulk materials										
	Class	4.1	4.2	4.3	5.1	6.1	7	8	9	MHB
Flammable solids	4.1	Х								
Substances liable to spontaneous combustion	4.2	2	X							
Substances which, in contact with water, emit flammable	4.3	3	3	X						
gases						1				
Oxidizing substances	5.1	3	3	3	Х					
Toxic substances	6.1	Х	Х	Х	2	Х				
Radioactive materials	7	2	2	2	2	2	Х			
Corrosive substances	8	2	2	2	2	Х	2	Х		
Miscellaneous dangerous substances and articles	9	Х	X	Х	Х	Х	2	Х	Х	
Materials Hazardous only in Bulk (MHB)	MHB	X	X	X	X	X	2	Х	X	X

Numbers relate to the following segregation terms:

2 Separated from:

In different holds when stowed under deck. Provided an intervening deck is resistant to fire and liquid, a vertical separation, i.e., in different compartments, may be accepted as equivalent to this segregation.

3 Separated by a complete compartment or hold from:

Either a vertical or a horizontal separation. If the decks are not resistant to fire and liquid, then only a longitudinal separation, i.e., by an intervening complete compartment, is acceptable.

X Segregation, if any, is shown in the individual schedules in this Code.





Legend



NOTE: Vertical lines represent transverse watertight bulkheads between cargo spaces.

#### Transport of solid wastes in bulk

#### 10.1 Preamble

10.1.1 The transboundary movement of wastes represents a threat to human health and to the environment.

10.1.2 Wastes shall be carried in accordance with the relevant international recommendations and conventions and in particular, where it concerns transport in bulk by sea, with the provisions of this Code.

#### 10.2 Definitions

10.2.1 *Wastes*, for the purpose of this section, means solid bulk cargoes containing or contaminated with one or more constituents which are subject to the provisions of this Code applicable to cargoes of classes 4.1, 4.2, 4.3, 5.1, 6.1, 8 or 9 for which no direct use is envisaged but which are carried for dumping, incineration or other methods of disposal.

10.2.2 *Transboundary movement of waste* means any shipment of wastes from an area under the national jurisdiction of one country to or through an area under the national jurisdiction of another country, or to or through an area not under the national jurisdiction of any country provided at least two countries are involved in the movement.

#### **10.3** Applicability

10.3.1 The provisions of this section are applicable to the transport of wastes in bulk by ships and shall be considered in conjunction with all other provisions of this Code.

10.3.2 Solid cargoes containing or contaminated with radioactive materials are subject to the provisions applicable to the transport of radioactive materials and are not to be considered as wastes for the purposes of this section.

#### **10.4** Transboundary movements under the Basel Convention<sup>\*</sup>

\* Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989).

Transboundary movement of wastes is permitted to commence only when:

- .1 notification has been sent by the competent authority of the country of origin, or by the generator or exporter through the channel of the competent authority of the country of origin, to the country of final destination; and
- .2 the competent authority of the country of origin, having received the written consent of the country of final destination stating that the wastes will be safely incinerated or treated by other methods of disposal, has given authorization for the movement.

#### 10.5 Documentation

In addition to the required documentation for the transport of solid bulk cargoes all transboundary movements of wastes shall be accompanied by a waste movement document from the point at which a transboundary movement commences to the point of disposal. This document shall be available at all times to the competent authorities and to all persons involved in the management of waste transport operations.

#### **10.6** Classification of wastes

10.6.1 A waste containing only one constituent which is a cargo subject to the provisions of this Code applicable to cargoes of classes 4.1, 4.2, 4.3, 5.1, 6.1, 8 or 9 shall be regarded as being that particular cargo. If the concentration of the constituent is such that the waste continues to present a hazard inherent in the constituent itself, it shall be classified as the class applicable to that constituent.

10.6.2 A waste containing two or more constituents which are cargoes subject to the provisions of this Code applicable to cargoes of classes 4.1, 4.2, 4.3, 5.1, 6.1, 8 or 9 shall be classified under the applicable class in accordance with their dangerous characteristics and properties as described in 10.6.3 and 10.6.4.

10.6.3 The classification according to dangerous characteristics and properties shall be carried out as follows:

- .1 determination of the physical and chemical characteristics and physiological properties by measurement or calculation followed by classification according to the criteria applicable to the constituents; or
- .2 if the determination is not practicable, the waste shall be classified according to the constituent presenting the predominant hazard.

10.6.4 In determining the predominant hazard, the following criteria shall be taken into account:

- .1 if one or more constituents fall within a certain class and the waste presents a hazard inherent in these constituents, the waste shall be included in that class; or
- .2 if there are constituents falling under two or more classes, the classification of the waste shall take into account the order of precedence applicable to cargoes with multiple hazards set out in the IMDG Code.

#### **10.7** Stowage and handling of wastes

Wastes shall be stowed and handled in accordance with the provisions of sections 1 to 9 of this Code and with any additional provisions included in the individual schedules for cargoes in Group B applicable to the constituents presenting the hazards.

#### 10.8 Segregation

Wastes shall be segregated in accordance with the provisions of 9.3.3 and 9.3.4, as appropriate.

# **10.9** Accident procedures

In the event that, during transport, a waste will constitute a danger for the carrying ship or the environment, the Master shall immediately inform the competent authorities of the countries of origin and destination and receive advice on the action to be taken.

#### **Security provisions**

Introductory note

The provisions of this section address the security of bulk cargoes in transport by sea. It should be borne in mind that some substances shipped as bulk cargo may through their intrinsic nature, or when shipped in combination with other substances, be used as constituents for, or enhance the effect of weapons used in the commission of unlawful acts. (It should also be borne in mind that ships used to carry bulk cargoes may also be used as a means to transport unauthorized weapons, incendiary devices or explosives, irrespective of the nature of the cargo carried.) National competent authorities may apply additional security provisions, which should be considered when offering or transporting bulk cargoes. The provisions of this chapter remain recommendatory except subsection 11.1.1.

11.1 General provisions for companies, ships and port facilities

11.1.1 The relevant provisions of chapter XI-2 of SOLAS 74, as amended, and of part A of the ISPS Code shall apply to companies, ships and port facilities engaged in the handling and transport of bulk cargoes and to which regulation XI-2 of SOLAS 74, as amended, apply taking into account the guidance given in part B of the ISPS Code.

11.1.2 Due regard should be given to the security-related provisions of the ILO/IMO Code of practice on security in ports and the IMDG Code, as appropriate.

11.1.3 Any shore-based company personnel, ship based personnel and port facility personnel engaged in the handling and transport of bulk cargoes should be aware of any security requirements for such cargoes, in addition to those specified in the ISPS Code, and commensurate with their responsibilities.

11.1.4 The training of the company security officer, shore-based company personnel having specific security duties, port facility security officer and port facility personnel having specific duties, engaged in the handling and transport of bulk cargoes, should also include elements of security awareness related to the nature of those cargoes, for example where such cargoes are materials hazardous only in bulk.

11.1.5 All shipboard personnel and port facility personnel who are not mentioned in subsection 11.1.4 and are engaged in the transport of bulk cargoes should be familiar with the provisions of the relevant security plans related to those cargoes, commensurate with their responsibilities.

11.2 General provisions for shore-side personnel

11.2.1 For the purpose of this subsection, shore-side personnel covers individuals such as those who:

- prepare transport documents for bulk cargoes;
- offer bulk cargoes for transport;
- accept bulk cargoes for transport;

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- handle bulk cargoes;
- prepare bulk cargoes loading/stowage plans;
- load/unload bulk cargoes into/from ships; and
- enforce or survey or inspect for compliance with applicable rules and regulations; or are otherwise involved in the handling and transport of bulk cargoes as determined by the competent authority.

However, the provisions of subsection 11.2 do not apply to:

- the company security officer and appropriate shore-based company personnel mentioned in section A/13.1 of the ISPS Code;
- the ship security officer and the shipboard personnel mentioned in sections A/13.2 and A/13.3 of the ISPS Code; and
- the port facility security officer, the appropriate port facility security personnel and the port facility personnel having specific security duties mentioned in sections A/18.1 and A/18.2 of the ISPS Code.

For the training of those officers and personnel, refer to the ISPS Code.

11.2.2 Shore-side personnel engaged in transport by sea of bulk cargoes should consider security provisions for the transport of bulk cargoes commensurate with their responsibilities.

## **11.2.3** Security training

11.2.3.1 The training of shore-side personnel should also include elements of security awareness, the need to control access to cargoes and ships, and general guidance on the types of bulk cargoes of security significance.

11.2.3.2 Security awareness training should address the nature of security risks, recognizing security risks, methods to address and reduce risks and actions to be taken in the event of a security breach. It should include awareness of security plans (if appropriate, refer to subsection 11.3), commensurate with the responsibilities of individuals and their part in implementing security plans.

11.2.3.3 Such training should be provided or verified upon employment in a position involving transport of bulk cargoes by sea and should be periodically supplemented with retraining.

11.2.3.4 Records of all security training undertaken should be kept by the employer and made available to the employee if requested.

## **11.3** Provisions for bulk cargoes with high potential security implications

11.3.1 For the purposes of this subsection, high consequence bulk cargoes with high potential security implications are those which have the potential for misuse in an unlawful act and which may, as a result, produce serious consequences such as mass casualties or mass destruction, for example, Class 5.1 ammonium nitrate UN 1942 and ammonium nitrate fertilizers UN 2067.

11.3.2 The provisions of this subsection do not apply to ships and to port facilities (see the ISPS Code for ship security plan and for port security plan).

11.3.3 Consignors and others engaged in the transport of bulk cargoes with high potential security implications should adopt, implement and comply with a security plan that addresses at least the elements specified in subsection 11.3.4.

11.3.4 The security plan should comprise at least the following elements:

- .1 specific allocation of responsibilities for security to competent and qualified persons with appropriate authority to carry out their responsibilities;
- .2 records of bulk cargoes with high potential security implications or types of bulk cargoes with high potential security implications transported;
- .3 review of current operations and assessment of vulnerabilities, including intermodal transfer, temporary transit storage, handling and distribution, as appropriate;
- .4 clear statements of measures, including training, policies (including response to higher threat conditions, new employee/employment verification, etc.), operating practices (e.g., choice/use of routes where known, control of access to ships, bulk cargo storage and loading areas, proximity to vulnerable infrastructure, etc.), equipment and resources that are to be used to reduce security risks;
- .5 effective and up to date procedures for reporting and dealing with security threats, breaches of security or security-related incidents;
- .6 procedures for the evaluation and testing of security plans and procedures for periodic review and update of the plans;
- .7 measures to ensure the security of transport information contained in the plan; and
- .8 measures to ensure that the distribution of transport information is limited as far as possible.

## Section 12

## Stowage factor conversion tables

## 12.1 Cubic metres per metric tonne to cubic feet per long ton (2240 lb, 1016 kg)

	racior. I	m/t = 3	J.0/ II /I	on (round		nearest	nunureut	noran		
m <sup>3</sup> /t	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	-	0.36	0.72	1.08	1.43	1.79	2.15	2.51	2.87	3.23
0.1	3.59	3.95	4.30	4.66	5.02	5.38	5.74	6.10	6.46	6.82
0.2	7.17	7.53	7.89	8.25	8.61	8.97	9.33	9.68	10.04	10.40
0.3	10.76	11.12	11.48	11.84	12.20	12.55	12.91	13.27	13.63	13.99
0.4	14.35	14.71	15.07	15.42	15.78	16.14	16.50	16.86	17.22	17.58
0.5	17.94	18.29	18.65	19.01	19.37	19.73	20.09	20.45	20.80	21.16
0.6	21.52	21.88	22.24	22.60	22.96	23.32	23.67	24.03	24.39	24.75
0.7	25.11	25.47	25.83	26.19	26.54	26.90	27.26	27.62	27.98	28.34
0.8	28.70	29.05	29.41	29.77	30.13	30.49	30.85	31.21	31.57	31.92
0.9	32.28	32.64	33.00	33.36	33.72	34.08	34.44	34.79	35.15	35.51
1.0	35.87	36.23	36.59	36.95	37.31	37.66	38.02	38.38	38.74	39.10
1.1	39.46	39.82	40.17	40.53	40.89	41.25	41.61	41.97	42.33	42.69
1.2	43.04	43.40	43.76	44.12	44.48	44.84	45.20	45.56	45.91	46.27
1.3	46.63	46.90	47.35	47.71	48.07	48.43	48.78	49.14	49.50	49.86
1.4	50.22	50.58	50.94	51.29	51.65	52.01	52.37	52.73	53.09	53.45
1.5	53.81	54.16	54.52	54.88	55.24	55.60	55.96	56.32	56.67	57.03
1.6	57.39	57.75	58.11	58.47	58.83	59.19	59.54	59.90	60.26	60.62
					ft <sup>3</sup> /ton					

Factor:  $1 \text{ m}^3/\text{t} = 35.87 \text{ ft}^3/\text{ton}$  (rounded to the nearest hundredth of a ft<sup>3</sup>/ton)

12.2	Cubic	feet per	r long	ton	$(ft^3/ton)$	(2240 lb,	1016 kg)	to cul	bic m	etres 1	per	metric	tonne
$(m^3/t)$	(2204 lb,	, 1000 kg	g)		. ,					-			

Factor: 1 ft<sup>3</sup>/ton =  $0.02788 \text{ m}^3/\text{t}$  (rounded to the nearest ten thousandth of a m<sup>3</sup>/t)

ft <sup>3</sup> /ton	0	1	2	3	4	5	6	7	8	9
0	-	0.0279	0.0558	0.0836	0.1115	0.1394	0.1676	0.1952	0.2230	0.2509
10	0.2788	0.3067	0.3346	0.3624	0.3903	0.4182	0.4461	0.4740	0.5018	0.5297
20	0.5576	0.5855	0.6134	0.6412	0.6691	0.6970	0.7249	0.7528	0.7806	0.8085
30	0.8364	0.8643	0.8922	0.9200	0.9479	0.9758	1.0037	1.0316	1.0594	1.0873
40	1.1152	1.1431	1.1710	1.1988	1.2267	1.2546	1.2825	1.3104	1.3382	1.3661
50	1.3940	1.4219	1.4498	1.4776	1.5055	1.5334	1.5613	1.5892	1.6170	1.6449
60	1.6728	1.7007	1.7286	1.7564	1.7843	1.8122	1.8401	1.8680	1.8958	1.9237
70	1.9516	1.9795	2.0074	2.0352	2.0631	2.0910	2.1189	2.1468	2.1746	2.2025
80	2.2304	2.2583	2.2862	2.3140	2.3419	2.3698	2.3977	2.4256	2.4534	2.4818
90	2.5092	2.5371	2.5650	2.5928	2.6207	2.6486	2.6765	2.7044	2.7322	2.7601
100	2.7880	2.8159	2.8438	2.8716	2.8995	2.9274	2.9553	2.9832	3.0110	3.0389

## Section 13

## **References to related information and recommendations**

## 13.1 General

This section lists the references to the IMO instruments relevant to the requirements in this Code. It should be noted that this listing is not exhaustive.

## 13.2 Reference list

The references to the subsections in this Code, references to the relevant IMO instruments and subjects are in the following tables. Column 1 contains the references to the subsection numbers in this Code. Column 2 contains the references to the relevant IMO Instruments. Column 3 identifies the relevant subjects.

Reference to subsections	Reference to the relevant	Subject
in this Code (1)	IMO instruments (2)	(3)

#### 13.2.1 Dangerous goods & classification

9.2	IMDG Code (SOLAS VII/1.1)	Classification of dangerous goods
	SOLAS VII/1.2	

## 13.2.2 Stability

2.1.3	SOLAS II-1/5-1	Stability information
2.1.3	SOLAS VI/8.1	Stability information
2.1.3	SOLAS VI/9.2.1	Stability information
2.1.3	SOLAS VI/9.4	Loading and trimming of bulk cargoes
2.1.3	SOLAS XII/8	Stability information

<sup>\*</sup> A reference to a provision in the SOLAS Convention is given in the form chapter/regulation. For example, SOLAS regulation II-1/5-1 means regulation 5-1 in chapter II-1 of the Convention.

## 13.2.3 Fire-extinguishing arrangements

General	SOLAS II-2/10.7	Fire extinguishing arrangements in cargo spaces
Group $B^*$		
General	FSS Code Chapter 9	Fixed fire detection and fire alarm systems
General	FSS Code Chapter 10	Sample extraction smoke detection systems
Group B	SOLAS II-2/19	Special requirements for ships carrying dangerous
		goods
Group A, B	MSC/Circ.1146	List of solid bulk cargoes for which a fixed gas
and C		fire-extinguishing system may be exempted

## 13.2.4 Ventilation

General	International Convention on	Ventilation openings
Group B	Load Lines 1966, Annex I,	
	regulation 19	
General	SOLAS II-2/9.7	Ventilation systems
Group B		
General	SOLAS II-2/19.3.4	Ventilation for ships carrying dangerous goods
Group B		

## 13.2.5 Personnel protection

General	IMO/WHO/ILO Medical First Aid Guide	First aid measures
Group B	for Use in Accidents Involving Dangerous	
	Goods (MFAG)	
General	SOLAS II-2/10.10 and FSS Code chapter 3	Fire-fighter's outfit
Group B		
General	SOLAS II-2/19.3.6.1 and FSS Code	Protective clothing
Group B	chapter 3	
General	SOLAS II-2/19.3.6.2 and FSS Code	Self-contained breathing apparatus
Group B	chapter 3	

## 13.2.6 Gas detection

General	SOLAS VI/5	Oxygen analysis and gas detection equipment.
General	Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo holds (MSC.1/Circ.1264), section 3.	Gas detection equipment for fumigation

## 13.2.7 Minimum information/Documentation

4.7.3	SOLAS II-2/19.4	Document of compliance for carriage of dangerous
		goods
4.2	SOLAS VI/4	Cargo information
4.2	SOLAS XII/10	Density of bulk cargoes
	SOLAS XII/8	Cargo restrictions and other information
4.2	SOLAS VI/9.2	Stability and other information on ships
4.2	SOLAS VII/10	Documentation for solid bulk dangerous goods

## **13.2.8** Insulation of machinery space boundaries

Group B	SOLAS II-2/3.2, 3.4, 3.10	Definitions of "A", "B" and "C" class divisions
Group B	SOLAS II-2/9.2	Fire integrity of bulkheads and decks
Group B	SOLAS II-2/19	Insulation requirement ("A-60")

## 13.2.9 Fumigation

3.6	Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo holds (MSC.1/Circ.1264), section 3.	Fumigation, application of fumigation, fumigants, safety precautions
3.6	SOLAS VI/6	Use of pesticides in ships

## 13.2.10 Segregation

9.4	SOLAS VII/11	Stowage and segregation requirement
9.4	IMDG Code, chapter 7.2.6	Segregation between bulk materials possessing chemical hazards and dangerous goods in packaged form

## 13.2.11 Transport of solid wastes in bulk

10.4	Basel Convention on the Control of	Permitted Transboundary
	Transboundary Movements of Hazardous	movement of wastes
	Wastes and their Disposal (1989)	
10.6	IMDG Code, chapter 7.8.4	Classification of waste materials

# 13.2.12 Entering enclosed spaces

3.2.5	MSC/Circ.744, 14 June 1996	Recommendations for Entering enclosed spaces
		aboard ships

## 13.2.13 Avoidance of excessive stresses

2.1.2	SOLAS XII/5 & 6	Structural strength
2.1.2	SOLAS XII/11	Loading instrument

## **APPENDIX 1**

## INDIVIDUAL SCHEDULES OF SOLID BULK CARGOES

## ALFALFA

## DESCRIPTION

Material derived from dried alfalfa grass. Shipped in the form of meal, pellets, etc. Requires a certificate from a competent authority or shipper stating that the material as shipped does not meet the requirements for seed cake. Shipments, which do meet the oil and moisture criteria for seed cake, should comply with the requirements for seed cake (a) UN 1386, seed cake (b) UN 1386 or seed cake UN 2217.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	508 to 719	139 to 1.97
SIZE	CLASS	GROUP
Fine Powder	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

## 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.

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## ALUMINA

## DESCRIPTION

Alumina is a fine, white odourless powder with little or no moisture. Insoluble in organic liquids. Moisture content: 0% to 5%. If wet, alumina is unpumpable. This cargo is insoluble in water.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	781 to 1087	0.92 to 1.28
SIZE	CLASS	GROUP
Fine Powder	Not applicable	С

## HAZARD

Alumina dust is very abrasive and penetrating. Irritating to eyes and mucous membranes. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

## 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. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

No special requirements.

## 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.

## ALUMINA, CALCINED

#### DESCRIPTION

Light to dark grey in colour. No moisture content. This cargo is insoluble in water.

## CHARACTERISTICS

ANGLE OF REPOSE BULK DENSITY (kg/m <sup>3</sup> )		STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1639	0.61
SIZE	CLASS	GROUP
Small particles and lumps	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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**

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.

## ALUMINA SILICA

### DESCRIPTION

White, consists of alumina and silica crystals. Low moisture content (1% to 5%). Lumps 60%. Coarse grained powder -40%. This cargo is insoluble in water.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1429	0.70
SIZE	CLASS	GROUP

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

#### LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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. I:\MSC\84\24-Add-3.doc

#### **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.

## **ALUMINA SILICA, Pellets**

## DESCRIPTION

White to off-white. No moisture content.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1190 to 1282	0.78 to 0.84
SIZE	CLASS	GROUP
Length: 6.4 mm to 25.4 mm Diameter: 6.4 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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. I:\MSC\84\24-Add-3.doc

## **ALUMINIUM FERROSILICON POWDER UN 1395**

#### DESCRIPTION

Fine powder or briquettes.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )		STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-		-
SIZE	CLASS	SUBSIDIARY RISK	GROUP
Not applicable	4.3	6.1	В

## HAZARD

In contact with water may evolve hydrogen, a flammable gas which may form an explosive mixture in air. Impurities may, under similar conditions produce phosphine and arsine, which are highly toxic gases.

This cargo is non-combustible or has a low fire-risk.

### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs and all class 8 liquids.

## 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 and 5 of the Code.

#### PRECAUTIONS

Prior to loading this cargo, a certificate shall be provided by the manufacturer or shipper stating that the material was stored under cover, but exposed to the weather in the particle size to be shipped, for not less than 3 days prior to shipment. The bulkheads between the cargo spaces and the engine-room shall be gastight and shall be inspected and approved by the competent authority. 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. At least two sets of self-contained breathing apparatus, in addition to those required by SOLAS regulation II-2/10.10, shall be provided on board.

#### 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.

### CARRIAGE

For quantitative measurements of hydrogen, phosphine and arsine and silane, 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 the voyage, and the results of the measurements shall be recorded and kept on board.

#### DISCHARGE

No special requirements.

#### **CLEAN-UP**

After discharge of this cargo, the cargo spaces shall be swept clean twice. Water shall not be used for cleaning of the cargo space which has contained this cargo, because of danger of gas.

#### **EMERGENCY PROCEDURES**

SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED
Self-contained breathing apparatus.
EMERGENCY PROCEDURES
Wear self-contained breathing apparatus.
<b>EMERGENCY ACTION IN THE EVENT OF FIRE</b>
Batten down and use $CO_2$ if available. <b>Do not use water</b> .
MEDICAL FIRST AID
Refer to the Medical First Aid Guide (MFAG), as amended.

## ALUMINIUM NITRATE UN 1438

### DESCRIPTION

Colourless or white crystals. Soluble in water.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Not applicable	5.1	В

#### HAZARD

If involved in a fire will greatly intensify the burning of combustible materials and yield toxic nitrous fumes. Although non-combustible, mixtures with combustible material are easily ignited and may burn fiercely.

#### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

#### 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 and 5 of the Code.

#### PRECAUTIONS

Due regard shall be paid to prevent contact of the cargo and combustible materials.

## 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, overalls, headgear). Self-contained breathing apparatus. Spray nozzles.

## **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Use copious quantities of water, which is best applied in the form of a spray to avoid disturbing the surface of the material. The material may fuse or melt; in which condition application of water may result in extensive scattering of the molten materials. Exclusion of air or the use of  $CO_2$  will not control the fire. Due consideration should be given to the effect on the stability of the ship due to accumulated water.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## ALUMINIUM SILICON POWDER, UNCOATED UN 1398

#### DESCRIPTION

Powder

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Not applicable	4.3	В

#### HAZARD

In contact with water may evolve hydrogen, a flammable gas which may form explosive mixtures with air. Impurities may, under similar circumstances, produce phosphine and arsine, which are highly toxic gases. May also evolve silanes, which are toxic and may ignite spontaneously.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs and all class 8 liquids.

## HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Prior to loading this cargo, a certificate shall be provided by the manufacturer or shipper stating that the material was stored under cover, but exposed to the weather in the particle size to be shipped, for not less than 3 days prior to shipment. The bulkheads between the cargo spaces and the engine-room shall be gastight and shall be inspected and approved by the competent authority. 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. This cargo shall be loaded in cargo spaces fitted with mechanical ventilation having at least two separate fans. The total ventilation shall be at least six air changes per hour, based on the empty space. At least two sets of self-contained breathing apparatus, in addition to those required by SOLAS regulation II-2/10.10, shall be provided on board.

### 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, phosphine, arsine, 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 the voyage, and the results of the measurements shall be recorded and kept on board.

#### DISCHARGE

No special requirements.

#### **CLEAN-UP**

After discharge of this cargo, the cargo spaces shall be swept clean twice.

Water shall not be used for cleaning of the cargo space which has contained this cargo, because of danger of gas.

## **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Self-contained breathing apparatus.

## **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down and use  $CO_2$  if available. Do not use water.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## ALUMINIUM SMELTING BY-PRODUCTS OR ALUMINIUM REMELTING BY-PRODUCT UN 3170

## DESCRIPTION

Aluminium smelting by-products are wastes from the aluminium manufacturing process. Grey or black powder or lumps with some metallic inclusions. The term encompasses various different waste materials, which include but are not limited to:

## ALUMINIUM DROSS ALUMINIUM SALT SLAGS ALUMINIUM SKIMMINGS

## SPENT CATHODES SPENT POTLINER

## CHARACT ERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1220	0.82
SIZE	CLASS	GROUP
Not applicable	4.3	В

## HAZARD

Contact with water may cause heating with possible evolution of flammable and toxic gases such as hydrogen, ammonia and acetylene.

This cargo is non-combustible or has a low fire-risk.

Fire is unlikely but may follow an explosion of flammable gas and will be difficult to extinguish. In port, flooding maybe considered, but due consideration should be given to stability.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs and all class 8 liquids.

## 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 and 5 of the Code.

#### PRECAUTIONS

Prior to loading this cargo, a 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 three days. 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. At least two self-contained breathing apparatus, in addition to those required by SOLAS regulation II-2/10.10, shall be provided on board. Bulkheads between the cargo spaces and the engine-room shall be gastight. Inadvertent pumping through machinery spaces shall be avoided.

## 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. Suitable detectors for quantitative measurements of hydrogen, ammonia and acetylene should be on board. Regularly monitor for hydrogen, ammonia and acetylene. Record and keep the measurements.

#### DISCHARGE

No special requirements.

#### **CLEAN-UP**

Water shall not be used for cleaning of the cargo space which has contained this cargo, because of danger of gas.

## **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 available. **Do not use water**. If this proves ineffective, endeavour to stop fire from spreading and head for the nearest suitable port.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## AMMONIUM NITRATE UN 1942

with not more than 0.2% total combustible substances including any organic substance calculated as carbon, to the exclusion of any other added substance

## (see AMMONIUM NITRATE BASED FERTILIZER UN 2067 & UN 2071)

## DESCRIPTION

White crystals, prills or granules. Wholly or partly soluble in water. Supporters of combustion. Hygroscopic.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
27° to 42°	1000	1.00
SIZE	CLASS	GROUP
1	_	2

## HAZARD

A major fire aboard a ship carrying these materials may involve a risk of explosion in the event of contamination (e.g., by fuel oil) or strong confinement. An adjacent detonation may also involve a risk of explosion. If heated strongly, this cargo decomposes, giving off toxic gases and gases which support combustion.

Ammonium nitrate dust might be irritating to skin and mucous membranes.

This cargo is hygroscopic and will cake if wet.

## **STOWAGE & SEGREGATION**

There should be no sources of heat or ignition in the cargo space.

"Separated by a complete compartment or hold from" combustible materials (particularly liquids), chlorates, chlorides, chlorites, hypochlorites, nitrites, permanganates and fibrous materials (e.g., cotton, jute, sisal, etc.).

"Separated from" all other goods.

If the bulkhead between the cargo space and the engine-room is not insulated to class A-60 standard, this cargo shall be stowed "away from" the bulkhead.

## 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 and 5 of the Code.

## Prior to loading, the following provisions shall be complied with:

- This cargo shall not be accepted for loading when the temperature of the cargo is above 40°C.
- Prior to loading, the shipper *shall* provide the master with a certificate signed by the shipper stating that all the relevant conditions of the cargo required by this Code including this individual schedule have been met.
- The fuel tanks situated under the cargo spaces to be used for the transport of this cargo *shall* be pressure tested to ensure that there is no leakage of manholes and piping systems leading to the tanks.
- All electrical equipment, other than those of approved intrinsically safe type, in the cargo spaces to be used for this cargo shall be electrically disconnected from the power source, by appropriate means other than a fuse, at a point external to the space. This situation shall be maintained while the cargo is on board.
- Due consideration shall be paid to the possible need to open hatches in case of fire to provide maximum ventilation and to apply water in an emergency and the consequent risk to the stability of the ship through fluidization of the cargo.

## During loading, the following provisions shall be complied with:

- Smoking shall not be allowed on deck and in the cargo spaces and. "NO SMOKING" signs shall be displayed while this cargo is on board.
- Bunkering of fuel oil shall not be allowed. Pumping of fuel oil in spaces adjacent to the cargo spaces for this cargo, other than the engine room, shall not be allowed.
- As far as reasonably practicable, combustible securing and protecting materials shall not be used. When wooden dunnage is necessary, only a minimum shall be used.

## PRECAUTIONS

This cargo shall only be accepted for loading when the competent authority satisfied in regard to the resistance to detonation of this material based on the test<sup>\*</sup>. Prior to loading, the shipper shall provide the master with a certificate stating that the resistance to detonation of this material is in compliance with this requirement. The master and officers shall note that a fixed gas fire-extinguishing system is ineffective on the fire involving this cargo and that applying water may be necessary. Pressure on the fire mains shall be maintained for fire-fighting and fire hoses shall be laid out or be in position and ready for immediate use during loading and discharging of this cargo. No welding, burning, cutting or other operations involving the use of fire, open flame, spark- or arc-producing equipment shall be carried out in the vicinity of the cargo spaces containing this cargo except in an emergency. Precautions shall be taken to avoid the penetration of this cargo into other cargo spaces, bilges and other enclosed spaces. Smoking shall not be allowed on deck and in the cargo spaces and "NO SMOKING" signs shall be displayed on deck whenever this cargo is on board. The hatches of the cargo spaces, whenever this material is on board, shall be kept free to be capable of being opened in case of an emergency. When the

<sup>\*</sup> Reference is made in section 5 of Appendix 2 to this Code.

bulkhead between the cargo space and the engine-room is not insulated to class A-60 standard, this cargo shall not be accepted for loading unless the competent authority approves that the arrangement is equivalent.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

Hatches of the cargo spaces carrying this cargo shall be weathertight to prevent the ingress of water.

## DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary. Bunkering or pumping of fuel oil shall not be allowed.

## **CLEAN-UP**

After discharge of this cargo, the bilge wells and the scuppers of the cargo spaces shall be checked and any blockage in the bilge wells and the scuppers shall be removed.

## **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing (boots, gloves, coveralls, and headgear). Self-contained breathing apparatus.

## **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Fire in a cargo space containing this material: Open hatches to provide maximum ventilation. Ship's fixed gas fire extinguishing will be inadequate. Use copious quantities of water. Flooding of the cargo space may be considered but due consideration should be given to stability.

Fire in an adjacent cargo space: Open hatches to provide maximum ventilation. Heat transferred from fire in an adjacent space can cause the material to decompose with consequent evolution of toxic fumes. Dividing bulkheads should be cooled.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## AMMONIUM NITRATE BASED FERTILIZER UN 2067

## DESCRIPTION

Crystals, granules or prills. Wholly or partly soluble in water. Hygroscopic.

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 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%.

#### Notes:

- 1. All nitrate ions for which there is present in the mixture a molecular equivalent of ammonium ions should be calculated as ammonium nitrate.
- 2. The transport of ammonium nitrate materials which are liable to self-heating sufficient to initiate decomposition is prohibited.
- 3. This entry may only be used for substances that do not exhibit explosive properties of class 1 when tested in accordance to Test Series 1 and 2 of class 1 (see UN Manual of Tests and Criteria, part I).

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
27° to 42°	900 to 1200	0.83 to 1.11
SIZE	CLASS	GROUP
1 to 5 mm	5.1	В

## CHARACTERISTICS

#### HAZARD

Supports combustion. A major fire aboard a ship carrying these substances may involve a risk of explosion in the event of contamination (e.g., by fuel oil) or strong confinement. An adjacent detonation may involve a risk of explosion.

If heated strongly decomposes, risk of toxic fumes and gases which supports combustion, in the cargo space and on deck.

Fertilizer dust might be irritating to skin and mucous membranes.

This cargo is hygroscopic and will cake if wet.

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## STOWAGE AND SEGREGATION

"Separated by a complete compartment or hold from" combustible materials (particularly liquid), bromates, chlorates, chlorates, hypochlorites, nitrites, perchlorates, permanganates, powdered metals and vegetable fibres (e.g., cotton, jute, sisal, etc.);

"Separated from" all other goods;

"Separated from" sources of heat or ignition (see also Loading);

Not to be stowed immediately adjacent to any tank or double bottom containing fuel oil heated to more than 50°C.

If the bulkhead between the cargo space and the engine-room is not insulated to class A-60 standard, this cargo shall be stowed "away from" the bulkhead.

## 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 and 5 of the Code.

## Prior to loading, the following provisions shall be complied with:

- This cargo shall not be accepted for loading when the temperature of the cargo is above 40°C.
- Prior to loading, the shipper shall provide the master with a certificate signed by the shipper stating that all the relevant conditions of the cargo required by this Code including this individual schedule have been met.
- The fuel tanks situated under the cargo spaces to be used for the transport of this cargo shall be pressure tested to ensure that there is no leakage of manholes and piping systems leading to the tanks.
- All electrical equipment, other than those of approved intrinsically safe type, in the cargo spaces to be used for this cargo shall be electrically disconnected from the power source, by appropriate means other than a fuse, at a point external to the space. This situation shall be maintained while the cargo is on board.
- Due consideration shall be paid to the possible need to open hatches in case of fire to provide maximum ventilation and to apply water in an emergency and the consequent risk to the stability of the ship through fluidization of the cargo.

## During loading, the following provisions shall be complied with:

Bunkering of fuel oil shall not be allowed. Pumping of fuel oil in spaces adjacent to the cargo spaces for this cargo, other than the engine room, shall not be allowed.

• As far as reasonably practicable, combustible securing and protecting materials shall not be used. When wooden dunnage is necessary, only a minimum shall be used.

## PRECAUTIONS

This cargo shall only be accepted for loading when the competent authority satisfied in regard to the resistance to detonation of this material based on the test<sup>\*</sup>. Prior to loading, the shipper shall provide the master with a certificate stating that the resistance to detonation of this material is in compliance with this requirement. Pressure on the fire mains shall be maintained for fire-fighting and fire hoses shall be laid out or be in position and ready for immediate use during loading and discharging of this cargo. No welding, burning, cutting or other operations involving the use of fire, open flame, spark- or arc-producing equipment shall be carried out in the vicinity of the cargo spaces containing this cargo except in an emergency. Smoking shall not be allowed on deck and in the cargo spaces and "NO SMOKING" signs shall be displayed on deck whenever this cargo is on board. Precautions shall be taken to avoid the penetration of this cargo into other cargo spaces, bilges and other enclosed spaces. The hatches of the cargo spaces, whenever this material is on board, shall be kept free to be capable of being opened in case of an emergency.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

Hatches of the cargo spaces carrying this cargo shall be weathertight to prevent the ingress of water. The temperature of this cargo shall be monitored and recorded daily during the voyage to detect decomposition resulting in spontaneous heating and oxygen depletion.

## DISCHARGE

Bunkering or pumping of fuel oil shall not be allowed. If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

## **CLEAN-UP**

After discharge of this cargo, the bilge wells and the scuppers of the cargo spaces shall be checked and any blockage in the bilge wells and the scuppers shall be removed.

<sup>\*</sup> Reference is made in section 5 of appendix 2 to this Code.

## **EMERGENCY PROCEDURES**

### SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing (boots, gloves, coveralls, and headgear). Self-contained breathing apparatus.

## **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Fire in a cargo space containing this material: Open hatches to provide maximum ventilation. Ship's fixed fire-fighting installation will be inadequate. Use copious quantities of water. Flooding of the cargo space may be considered but due consideration should be given to stability.

Fire in an adjacent cargo space: Open hatches to provide maximum ventilation. Heat transferred from fire in an adjacent space can cause the material to decompose with consequent evolution of toxic fumes. Dividing bulkheads should be cooled.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## AMMONIUM NITRATE BASED FERTILIZER UN 2071

## DESCRIPTION

Usually granules. Wholly or partly soluble in water. Hygroscopic.

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 (see UN Manual of Tests and Criteria, part III, subsection 38.2) that they are not liable to self-sustaining decomposition.

## Notes:

- 1. All nitrate ions for which there is present in the mixture a molecular equivalent of ammonium ions should be calculated as ammonium nitrate.
- 2. The transport of ammonium nitrate materials which are liable to self-heating sufficient to initiate a decomposition is prohibited.
- 3. The NPK proportions for a fertilizer should not be used as a guide to its ability to undergo self-sustaining decomposition as this depends on the chemical species present (refer to UN Manual of Tests and Criteria, part III, subsection 38.2).

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
27° to 42°	900 to 1200	0.83 to 1.11
SIZE	CLASS	GROUP
1 to 5 mm	0	В

## CHARACTERISTICS

## HAZARD

These mixtures may be subject to self-sustaining decomposition if heated. The temperature in such a reaction can reach 500°C. Decomposition, once initiated, may spread throughout the remainder, producing gases which are toxic. None of these mixtures is subject to the explosion hazard.

Fertilizer dust might be irritating to skin and mucous membranes.

This cargo is hygroscopic and will cake if wet.

## **STOWAGE AND SEGREGATION**

"Separated by a complete compartment or hold from" combustible materials (particularly liquid), bromates, chlorates, chlorates, hypochlorites, nitrites, perchlorates, permanganates, powdered metals and vegetable fibres (e.g., cotton, jute, sisal, etc.).

"Separated from" all other goods.

"Separated from" sources of heat or ignition (see also Loading).

Not to be stowed immediately adjacent to any tank or double bottom containing fuel oil heated to more than 50°C.

If the bulkhead between the cargo space and the engine-room is not insulated to class A-60 standard, "away from" the bulkhead.

## 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 and 5 of the Code.

## Prior to loading, the following provisions shall be complied with:

- All electrical equipment, other than those of approved intrinsically safe type, in the cargo spaces to be used for this cargo shall be electrically disconnected from the power source, by appropriate means other than fuse, at a point external to the space. This situation shall be maintained while the cargo is on board.
- Due consideration shall be paid to the possible need to open hatches in case of fire to provide maximum ventilation and to apply water in an emergency and the consequent risk to the stability of the ship through fluidization of the cargo.
- In addition, if decomposition occurs, the residue left after decomposition may have only half the mass of the original cargo. Due consideration shall be paid to the effect of the loss of mass on the stability of the ship.

## During loading, the following provisions shall be complied with:

Bunkering of fuel oil shall not be allowed. Pumping of fuel oil in spaces adjacent to the cargo spaces for this cargo, other than the engine room, shall not be allowed.

#### PRECAUTIONS

This cargo shall only be accepted for loading when, as a result of testing in the trough test, its liability to self-sustaining decomposition shows decomposition rate not greater than 0.25 m/h. Pressure on the fire mains shall be maintained for fire-fighting and fire hoses shall be laid out or be in position and ready for immediate use during loading and discharging of this cargo. No welding, burning, cutting or other operations involving the use of fire, open flame, spark- or arc-producing equipment shall be carried out in the vicinity of the cargo spaces containing this cargo except in an emergency. Smoking shall not be allowed on deck and in the cargo spaces and "NO SMOKING" signs shall be displayed on deck whenever this cargo is on board. Precautions shall be taken to avoid the penetration of this cargo into other cargo spaces, bilges and other enclosed spaces. The hatches of the cargo spaces, whenever this material is on board, shall be kept free to be capable of being opened in case of an emergency.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

Hatches of the cargo spaces carrying this cargo shall be weathertight to prevent the ingress of water.

The temperature of this cargo shall be monitored and recorded daily during the voyage to detect decomposition resulting in spontaneous heating and oxygen depletion.

## DISCHARGE

Bunkering or pumping of fuel oil shall not be allowed. If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

## **CLEAN-UP**

After discharge of this cargo, the bilge wells and the scuppers of the cargo spaces shall be checked and any blockage in the bilge wells and the scuppers shall be removed.

## **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing (boots, gloves, coveralls, and headgear). Self-contained breathing apparatus.

## **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Fire in a cargo space containing this material: Open hatches to provide maximum ventilation. Ship's fixed fire-fighting installation will be inadequate. Use copious quantities of water. Flooding of the cargo space may be considered but due consideration should be given to stability.

Fire in an adjacent cargo space: Open hatches to provide maximum ventilation. Heat transferred from fire in an adjacent space can cause the material to decompose with consequent evolution of toxic fumes. Dividing bulkheads should be cooled.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## AMMONIUM NITRATE BASED FERTILIZER (non-hazardous) (see AMMONIUM NITRATE-BASED FERTILIZER UN 2067 & UN 2071)

## DESCRIPTION

Crystals, granules or prills non-cohesive when dry. Wholly or partly soluble in water.

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 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 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 (see UN Manual of Tests and Criteria, part III, subsection 38.2) that they are liable to self-sustaining decomposition or if they contain an excess of nitrate greater than 10% by mass.

## Notes:

- 1. All nitrate ions for which there is present in the mixture a molecular equivalent of ammonium ions should be calculated as ammonium nitrate.
- 2. The transport of ammonium nitrate materials which are liable to self-heating sufficient to initiate decomposition is prohibited.
- 3. The NPK proportions for a fertilizer should not be used as a guide to its ability to undergo self-sustaining decomposition as this depends on the chemical species present (refer to UN Manual of Tests and Criteria, part III, subsection 38.2).
- 4. This schedule may only be used for substances that do not exhibit explosive properties of class 1 when tested in accordance to Test Series 1 and 2 of class 1 (see UN Manual of Tests and criteria, part I).
- 5. This schedule may only be used if the chemical or physical properties of an ammonium nitrate based fertilizer are such that when tested it does not meet the established defining criteria of any class.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
27° to 42°	1000 to 1200	0.83 to 1.00
SIZE	CLASS	GROUP

## HAZARD

This cargo is non-combustible or with a low fire-risk.

Even though this cargo is classified as non-hazardous, it will behave in the same way as the ammonium nitrate based fertilizers classified in class 9 under UN 2071 when heated strongly, by decomposing and giving off toxic gases.

The speed of the decomposition reaction is lower, but there will be a risk of toxic fumes in the cargo space and on deck if the cargo is strongly heated.

Fertilizer dust might be irritating to skin and mucous membranes.

This cargo is hygroscopic and will cake if wet.

## STOWAGE AND SEGREGATION

The compatibility of non-hazardous ammonium nitrate based fertilizers with other materials which may be stowed in the same cargo space should be considered before loading.

"Separated from" sources of heat or ignition (see also LOADING).

Not to be stowed immediately adjacent to any tank or double bottom containing fuel oil heated to more than 50°C.

Fertilizers of this type should be stowed out of direct contact with a metal engine-room boundary. This may be done, for example, by using flame-retardant bags containing inert materials or by any equivalent barrier approved by the competent authority. This requirement need not apply to short international voyages.

## 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 and 5 of the Code.
# Prior to loading, the following provisions shall be complied with:

- All electrical equipment, other than those of approved intrinsically safe type, in the cargo spaces to be used for this cargo shall be electrically disconnected from the power source, by appropriate means other than a fuse, at a point external to the space. This situation shall be maintained while the cargo is on board.
- Due consideration shall be paid to the possible need to open hatches in case of fire to provide maximum ventilation and to apply water in an emergency and the consequent risk to the stability of the ship through fluidization of the cargo.
- In addition, if decomposition occurs, the residue left after decomposition may have only half the mass of the original cargo. Due consideration shall be paid to the effect of the loss of mass on the stability of the ship.

# During loading, the following provisions shall be complied with:

Bunkering of fuel oil shall not be allowed. Pumping of fuel oil in spaces adjacent to the cargo spaces for this cargo, other than the engine room, shall not be allowed.

# PRECAUTIONS

No welding, burning, cutting or other operations involving the use of fire, open flame, spark or arc-producing equipment shall be carried out in the vicinity of the cargo spaces containing this cargo except in an emergency. Smoking shall not be allowed on deck and in the cargo spaces and "NO SMOKING" signs shall be displayed on deck whenever this cargo is on board. The hatches of the cargo spaces, whenever this material is on board, shall be kept free to be capable of being opened in case of an emergency.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

The cargo spaces carrying this cargo shall not be ventilated during voyage.

# CARRIAGE

Hatches of the cargo spaces carrying this cargo shall be weathertight to prevent the ingress of water.

The temperature of this cargo shall be monitored and recorded daily during the voyage to detect decomposition resulting in spontaneous heating and oxygen depletion.

# DISCHARGE

Bunkering or pumping of fuel oil shall not be allowed. If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

# **CLEAN-UP**

After discharge of this cargo, the bilge wells and the scuppers of the cargo spaces shall be checked and any blockage in the bilge wells and the scuppers shall be removed.

# **EMERGENCY PROCEDURES**

# SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing (boots, gloves, coveralls, and headgear). Self-contained breathing apparatus.

# **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Fire in a cargo space containing this material: Open hatches to provide maximum ventilation. Ship's fixed fire-fighting installation will be inadequate. Use copious quantities of water. Flooding of the cargo space may be considered but due consideration should be given to stability.

Fire in an adjacent cargo space: Open hatches to provide maximum ventilation. Heat transferred from fire in an adjacent space can cause the material to decompose with consequent evolution of toxic fumes. Dividing bulkheads should be cooled.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

# AMMONIUM SULPHATE

#### DESCRIPTION

Brownish grey to white crystals. Soluble in water. Free flowing. Absorbs moisture. Moisture content 0.04% to 0.5%. Ammonia odour. Subject to natural loss in weight.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
28° to 35°	943 to 1052	0.95 to 1.06
SIZE	CLASS	GROUP
	•	

# HAZARD

Dust may cause skin and eye irritation. Harmful if swallowed. Even though this cargo is classified as non-hazardous, it may cause heavy corrosion of framing, side shell, bulkhead etc. if sweating of cargo space occurs.

This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & SEGREGATION**

No special requirements.

#### 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

Avoid generating dust when loading. During loading, due consideration shall be paid to minimize dust generation. Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

The cargo spaces carrying this cargo shall not be ventilated during voyage.

# CARRIAGE

No special requirements.

# DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

# **CLEAN-UP**

After discharge of this cargo, the cargo spaces shall be thoroughly cleaned and washed out to remove all traces of the cargo, and dried, except in the case that the cargo to be loaded has the same BCSN of the cargo to be loaded subsequent to discharge is AMMONIUM SULPHATE.

# ANTIMONY ORE AND RESIDUE

# DESCRIPTION

Lead grey mineral, subject to black tarnish.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2381 to 2941	0.34 to 0.42
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

# HAZARD

This cargo is non-combustible or has a low fire-risk. If involved in a fire, dangerous fumes of antimony and sulphur oxides can evolve.

# **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

# PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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. I:\MSC\84\24-Add-3.doc

# **BARIUM NITRATE UN 1446**

#### DESCRIPTION

Glossy white crystals or powder. Soluble in water.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENS	SITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-	-
SIZE	CLASS	SUBSIDIARY RISK	GROUP
Fine Powder	5.1	6.1	В

#### HAZARD

Toxic if swallowed or by dust inhalation. If involved in a fire mixture with combustible materials are readily ignited and may burn fiercely.

# **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

# WEATHER PRECAUTIONS

No special requirements.

# LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

# PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

# VENTILATION

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo.

#### 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). Self-contained breathing apparatus. Spray nozzles.

# **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Use copious amounts of water, which is best applied in the form of a spray to avoid disturbing the surface of the material. The material may fuse or melt, in which condition application of water may result in excessive scattering of molten materials. Exclusion of air or the use of CO<sub>2</sub> will not control the fire. Due consideration should be given to the stability of the ship due to the effect of accumulated water.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

# BARYTES

#### DESCRIPTION

Crystalline ore mineral. A sulphate of Barium. Moisture 1% to 6%.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2941	0.34
SIZE	CLASS	GROUP
80% lumps: 6.4 to 101.6 mm 20% fines: less than 6.4 mm	Not applicable	С

# HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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.

# BAUXITE

# **DESCRIPTION**

A brownish, yellow claylike and earthy mineral. Moisture content: 0% to 10%. Insoluble in water.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1190 to 1389	0.72 to 0.84
SIZE	CLASS	GROUP
70% to 90% lumps: 2.5 mm to 500 mm 10% to 30% powder	Not applicable	С

# HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & 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

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

# VENTILATION

No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

# BIOSLUDGE

# DESCRIPTION

Heat-dried activated sludge. Very fine granular product. Moisture: 3% to 5%. Black speckled colour.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	654	1.53
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

# HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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.

# **BORAX (PENTAHYDRATE CRUDE)**

#### **DESCRIPTION**

A chemical compound of Boracic Acid and soda. Free flowing powder or granules. Grey colour. Dusty.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1087	0.92
SIZE	CLASS	GROUP
Up to 2.36 mm	Not applicable	С

# HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet.

# **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

# LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

# PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

# VENTILATION

No special requirements.

# CARRIAGE

No special requirements.

# DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

# CLEAN-UP

No special requirements.

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# **BORAX, ANHYDROUS** (crude or refined)

# **DESCRIPTION**

Crude is normally of yellow white appearance. When highly refined becomes white crystalline. Dusty and hygroscopic.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
35	1282	0.78
SIZE	CLASS	GROUP

# HAZARD

Dust very abrasive and irritating, but not toxic, if inhaled. This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet.

# **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

No special requirements.

# DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

# CLEAN-UP

No special requirements.

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# **BROWN COAL BRIQUETTES**

#### DESCRIPTION

Brown Coal (Lignite) Briquettes are manufactured by pressing dried brown coal particles into compressed blocks.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	750	1.34
		CDOUD
SIZE	CLASS	GROUP

# HAZARD

Briquettes are easily ignited, liable to spontaneous combustion and will deplete oxygen in cargo space.

# **STOWAGE & SEGREGATION**

Refer to the appendix to this schedule.

# HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo. Previous cargo battens shall be removed from the cargo spaces.

# WEATHER PRECAUTIONS

No special requirements.

# LOADING

Refer to the appendix to this schedule.

# PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

# VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage. Refer to the appendix to this schedule.

# CARRIAGE

Refer to the appendix to this schedule.

# DISCHARGE

Refer to the appendix to this schedule.

# **CLEAN-UP**

After discharge of this cargo, the bilge wells and the scuppers of the cargo spaces shall be checked and any blockage in the bilge wells and the scuppers shall be removed.

# **EMERGENCY PROCEDURES**

# **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Nil

# **EMERGENCY PROCEDURES**

Nil

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down. Exclusion of air may be sufficient to control fire. **Do not use water.** Seek expert advice and consider heading for the nearest suitable port.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

#### REMARK

The use of CO<sub>2</sub> or inert gas, if available, should be withheld until fire is apparent.

# APPENDIX

# **BROWN COAL BRIQUETTES**

# HAZARD

- 1. This cargo is easily ignited, liable to heat spontaneously and deplete oxygen in the cargo space.
- 2. This cargo is subject to oxidation, leading to depletion of oxygen and an increase in carbon dioxide in the cargo space (see also section 3).
- 3. This cargo is liable to heat spontaneously and may ignite spontaneously in the cargo space. When spontaneous heating occurs, flammable and toxic gases, including carbon monoxide, may be produced. Carbon monoxide is an odourless gas, slightly lighter than air, and has flammable limits in air of 12% to 75% by volume. It is toxic by inhalation, with an affinity for blood haemoglobin over 200 times that of oxygen. The recommended Threshold Limit Value (TLV) for carbon monoxide exposure is 50 ppm.

# **STOWAGE & SEGREGATION**

- 1. Boundaries of cargo spaces where these cargoes are carried *shall* be resistant to fire and liquids.
- 2. This cargo *shall* be "separated from" goods of classes 1 (Division 1.4), 2, 3, 4 and 5 in packaged form (see IMDG Code) and "separated from" solid bulk material of classes 4 and 5.1.
- 3. Stowage of goods of class 5.1 in packaged form or solid bulk materials of class 5.1 above or below this cargo *shall* be prohibited.
- 4. This cargo *shall* be "separated longitudinally by an intervening complete compartment or hold from" goods of class 1 other than Division 1.4.
- 5 This cargo *shall* not be stowed adjacent to sources of heat.

Note: For interpretation of these terms, see section 9.

# LOADING

- 1. Prior to loading, the shipper, or their appointed agent, *shall* provide in writing to the master, the characteristics of the cargo and the recommended safe handling procedures for loading and transport of the cargo. As a minimum, the cargo's contract specifications for moisture content, sulphur content and size *shall* be stated.
- 2. This cargo *shall* be stored for 7 days prior to loading. This substantially reduces the risk of spontaneous combustion in subsequent transport, storage and handling.
- 3. Before loading this cargo, the master *shall* ensure the following:
  - 3.1 weather deck enclosures to the cargo space have been inspected to ensure their integrity. Such closures are closed and sealed;
  - 3.2 all electrical cables and components situated in cargo spaces and adjacent spaces are free from defects. Such cables and electrical components are safe to be used in a flammable and/or dusty atmosphere or positively isolated;
- 4. Smoking and the use of naked flames shall not be permitted in the cargo areas and adjacent spaces and appropriate warning notices shall be posted in conspicuous places. Burning, cutting, chipping, welding or other sources of ignition shall not be permitted in the vicinity of cargo spaces or in other adjacent spaces.
- 5. This cargo *shall* not be dropped more than one metre during loading to minimize the production of dust and fines.

- 6. Individual cargo spaces *shall* be loaded without interruption, where possible. Hot spots may develop in a cargo space that has been kept open for more than six days (or less in weather over  $30^{\circ}$ C).
- 7. Prior to departure, the master shall be satisfied that the surface of the material has been trimmed reasonably level to the boundaries of the cargo space to avoid the formation of gas pockets and to prevent air from permeating the body of the briquettes. Casing leading into the cargo space *shall* be adequately sealed. The shipper *shall* ensure that the master receives the necessary cooperation from the loading terminal.
- 8. Individual cargo spaces *shall* be closed and sealed as soon as practicable after the cargo has been loaded into each cargo space.

# PRECAUTIONS

- 1. The ship shall be suitably fitted and carry on board appropriate instruments for measuring the following without requiring entry into the cargo space:
- 2. It is recommended that means be provided for monitoring the temperature of the cargo in the range of 0°C to 100°C to enable the measurement of temperature of the cargo during the voyage without requiring entry into the cargo space.

# CARRIAGE

- 1. As far as practicable, any gases which may be emitted from the cargo shall not be allowed to accumulate in adjacent enclosed spaces, such as store-rooms, carpenter's shop, passage ways, tunnels, etc. Such spaces *shall* be adequately ventilated and regularly monitored for methane, oxygen and carbon monoxide.
- 2. Under no circumstances, except in emergency, *shall* the hatches be opened or the cargo space be ventilated or entered during the voyage.
- 3. The atmosphere in the space above the cargo in each cargo space *shall* be regularly monitored for the concentrations of methane, oxygen and carbon monoxide.
- 4. The frequency of the monitoring *shall* be determined based upon the information provided by the shipper and the information obtained through the analysis of the atmosphere in the cargo space. The monitoring *shall* be conducted at least daily and as close as practical to the same time of day. The results of monitoring shall be recorded. The shipper may request more frequent monitoring, particularly if there is evidence of significant self-heating during the voyage.
- 5. The following issues shall be taken into account:
  - 5.1 The oxygen level in the sealed cargo space will fall from an initial 21% over a period of days to stabilize at levels of the order of 6 to 15%. If the oxygen level does not fall below 20%, or rapidly increases after an initial fall, it is possible that the cargo space is inadequately sealed and is at risk of spontaneous combustion.
  - 5.2 Carbon monoxide levels will build up to concentrations which fluctuate in the 200 to 2000 parts per million (ppm) range in a safe, well sealed cargo space. A rapid increase of approximately 1000 ppm in carbon monoxide levels in this cargo over a 24-hour period is a possible indicator of spontaneous combustion, particularly if accompanied by an increase in methane levels.
  - 5.3 The methane composition in briquette cargo is normally low, less than 5 ppm and does not constitute a hazard. However, a sudden and continuing rise in methane levels, to concentrations above 10 ppm, is an indicator of the occurrence of spontaneous combustion in the hold.

- 5.4 The temperature in this cargo in a well sealed cargo space normally remains at 5 to 10°C above sea water temperature, the increase being due to normal diurnal breathing of small quantities of air into the cargo space. Checking of the cargo space seals to minimize air leakage is essential. A rapid increase in temperature of approximately 20°C over 24 hours is evidence of spontaneous combustion.
- 6. Regular hold bilge testing *shall* be systematically carried out. If the pH monitoring indicates that a corrosion risk exists, the master *shall* ensure that all bilges are kept dry during the voyage in order to avoid possible accumulation of acids on tank tops and in the bilge system.
- 7. When the behaviour of the cargo during the voyage differs from that specified in the cargo information, the master *shall* report such differences to the shipper. Such reports will enable the shipper to maintain records on the behaviour of this cargo, so that the information being provided to the master can be reviewed in the light of the transport experience.
- 8. When the master is concerned that the cargo is showing any signs of self-heating or spontaneous combustion, such as an increase in the concentration of methane or carbon monoxide or an increase in temperature, as described above, the following actions *shall* be taken:
  - 8.1 Consult with the ship's agent at the loading port. The Company's designated person ashore shall be advised immediately.
  - 8.2 Check the seal of the cargo space and re-seal the cargo space, as necessary.
  - 8.3 Do not enter the cargo space and do not open the hatches, unless the master considers access is necessary for the safety of the ship or safety of life. When any ship's personnel has entered into a cargo space, re-seal the cargo space immediately after the personnel vacate the cargo space.
  - 8.4 Increase the frequency of monitoring the gas composition, and temperature when practicable, of the cargo.
  - 8.5. Send the following information, as soon as possible, to the ship's owner or agent at the loading port to obtain expert advice:
    - .1 the number of cargo spaces involved;
    - .2 monitoring results of the carbon monoxide, methane and oxygen concentrations;
    - .3 if available, temperature of the cargo, location and method used to obtain results;
    - .4 the time the gas analyses were taken (monitoring routine);
    - .5 the quantity of the cargo in the cargo space(s) involved;
    - .6 the description of the cargo as per the shipper's declaration, and any special precautions indicated on the declaration;
    - .7 the date of loading, and Estimated Time of Arrival (ETA) at the intended discharge port (which *shall* be specified); and
    - .8 any other comments or observations the master may consider relevant.

# DISCHARGE

Prior to, and during, discharge:

- 1. The cargo space shall be kept closed until just before the commencement of discharge of that space. The cargo may be sprayed with a fine water spray to reduce dust.
- 2. Personnel shall not enter the cargo space without having tested the atmosphere above the cargo. The personnel entering into a cargo space in which the atmosphere contains oxygen levels below 21% shall wear self-contained breathing apparatus. Carbon dioxide and carbon monoxide gas levels *shall* also be tested prior to entry into the cargo spaces. The recommended Threshold Limit Value (TLV) for carbon monoxide is 50 ppm.
- 3. During discharge, attention *shall* be paid to the cargo for signs of hot spots (i.e., steaming). If a hot spot is detected, the area shall be sprayed with fine water spray and the hot spot shall be removed immediately to prevent spreading. The hot spot cargo shall be spread out on the wharf away from the remainder of the cargo.
- 4. Prior to suspending the discharge of this cargo for more than eight hours, the hatch covers and all other ventilation for the cargo space *shall* be closed.

# PROCEDURES FOR GAS MONITORING OF BROWN COAL BRIQUETTE CARGOES

# 1 **Observations**

1.1 Carbon monoxide monitoring, when conducted in accordance with the following procedures, will provide a reliable early indication of self-heating within this cargo. This allows preventive action to be considered without delay. A sudden rapid rise in carbon monoxide detected within a cargo space, particularly if accompanied by an increase in methane levels, is a conclusive indication that self-heating is taking place.

1.2 All vessels engaged in the carriage of this cargo *shall* carry on board an instrument for measuring methane, oxygen and carbon monoxide gas concentrations, to enable the monitoring of the atmosphere within the cargo space. This instrument *shall* be regularly serviced and calibrated in accordance with the manufacturer's instructions. Care shall be exercised in interpreting methane measurements carried out in the low oxygen concentrations often found in unventilated cargo holds. The catalytic sensors normally used for the detection of methane rely on the presence of sufficient oxygen for accurate measurement. This phenomenon does not affect the measurement of carbon monoxide, or measurement of methane by infrared sensor. Further guidance may be obtained from the instrument manufacturer.

# 2 Sampling and measurement procedure

# 2.1 Equipment

2.1.1 An instrument which is capable of measuring methane, oxygen and carbon monoxide concentrations shall be provided on board a ship carrying this cargo. The instrument *shall* be fitted with an aspirator, flexible connection and a length of spark-proof metal tubing to enable a representative sample to be obtained from within the square of the hatch.

2.1.2 When recommended by the manufacturer, a suitable filter *shall* be used to protect the instrument against the ingress of moisture. The presence of even a small amount of water will compromise the accuracy of the measurement.

# 2.2 Siting of sampling points

2.2.1 In order to obtain meaningful information about the behaviour of this cargo in a cargo space, gas measurements *shall* be made via one sample point per cargo space. To ensure flexibility of measurement in adverse weather, however, two sample points *shall* be provided per cargo space, one on the port side and one on the starboard side of the hatch cover or hatch coaming (refer to diagram of gas sampling point). Measurement from either of these locations is satisfactory.



Diagram of gas sampling point

2.2.2 Each sample point *shall* comprise a hole of diameter approximately 12 mm positioned as near to the top of the hatch coaming as possible. It *shall* be sealed with a sealing cap to prevent ingress of water and air. It is essential this cap be securely replaced after each measurement to maintain a tight seal.

2.2.3 The provision of any sample point *shall* not compromise the seaworthiness of the vessel.

# 2.3 Measurement

The explanation on procedures for measurement is as follows:

- .1 remove the sealing cap, insert the rigid tube into the sampling point and tighten the integral cap to ensure an adequate seal;
- .2 connect the instrument to the sampling tube;
- .3 draw a sample of the atmosphere through the tube, using the aspirator, until steady readings are obtained;
- .4 log the results on a form which records cargo hold, date and time for each measurement; and
- .5 put back the sealing cap.

# **CALCIUM NITRATE UN 1454**

#### **DESCRIPTION**

White deliquescent solid soluble in water. The provisions of this Code should 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.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	893 to 1099	0.91 to 1.12
SIZE	CLASS	GROUP
Not applicable	5.1	В

# HAZARD

Non-combustible materials. If involved in a fire, will greatly intensify the burning of combustible materials. Although non-combustible, mixtures with combustible material are easily ignited and may burn fiercely.

This cargo is hygroscopic and will cake if wet.

This cargo is harmful if swallowed.

# **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

# 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

Appropriate measures shall be taken to prevent the cargo from contact with combustible materials.

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.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

# CARRIAGE

No special requirements.

# DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

# **CLEAN-UP**

No special requirements.

# **EMERGENCY PROCEDURES**

# SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus. Spray nozzles.

# **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Use copious quantities of water, which is best applied in the form of a spray to avoid disturbing the surface of the material. The material may fuse or melt, in which condition application of water may result in extensive scattering of the molten materials. Exclusion of air or the use of CO<sub>2</sub> will not control the fire. Due consideration should be given to the stability of the ship due to the effect of accumulated water.

# **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

# CALCIUM NITRATE FERTILIZER

# DESCRIPTION

Granules mainly of a double salt (calcium nitrate and ammonium nitrate) and containing not more than 15.5% total nitrogen and at least 12% water. Refer to the schedule for Calcium Nitrate UN No:1454 where the total nitrogen content exceeds 15.5%, or where the water content is less than 12%.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
34°	1053 to 1111	0.90 to 0.95
SIZE	CLASS	GROUP
1 mm to 4 mm	Not applicable	С

# HAZARD

No special hazards.

This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

# 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 and 5 of the Code.

# PRECAUTIONS

No special requirements.

# VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

# CARRIAGE

No special requirements.

#### **DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

# CARBORUNDUM

#### **DESCRIPTION**

A hard black crystalline compound of carbon and silicon. Odourless. No moisture content.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1786	0.56
SIZE	CLASS	GROUP
75% lumps: under 203.2 mm 25% lumps: under 12.7 mm	Not applicable	С

# HAZARD

Slightly toxic by inhalation. This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & 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

Protect machinery, accommodation and equipment from dust. Personnel involved in cargo handling should wear protective clothing and dust filter masks.

**VENTILATION** No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

# CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE UN 2969

#### DESCRIPTION

The beans from which castor oil is obtained.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Not applicable	9	В

# HAZARD

Contain a powerful allergen which, by inhalation of dust or by skin contact with crushed bean products, can give rise to severe irritation of the skin, eyes, and mucous membranes in some persons. They are also toxic by ingestion.

#### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs and oxidizing materials (goods in packages and solid bulk 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.

#### PRECAUTIONS

Due consideration shall be paid to prevent dust entering living quarters and working areas. Castor meal, castor pomace and castor flakes shall not be carried in bulk.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo.

CARRIAGE

No special requirements.

# DISCHARGE

No special requirements.

# **CLEAN-UP**

After discharge of this cargo, the cargo spaces shall be thoroughly cleaned and washed out to remove all traces of the cargo.

# **EMERGENCY PROCEDURES**

# **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus. Spray nozzles.

# **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down. Use ship's fixed fire-fighting installation if available. Exclusion of air may be sufficient to control fire.

# **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

# CEMENT

# DESCRIPTION

Cement is a finely ground powder which becomes almost fluid in nature when aerated or significantly disturbed thereby creating a very minimal angle of repose. After loading is completed de-aeration occurs almost immediately and the product settles into a stable mass. Cement dust can be a major concern during loading and discharge if the vessel is not specially designed as a cement carrier or shore equipment is not fitted with special dust control equipment.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1000 to 1493	0.67 to 1.00
SIZE	CLASS	GROUP
Up to 0.1 mm	Not applicable	С

# HAZARD

It may shift when aerated. This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & SEGREGATION**

No special requirements.

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

The ship shall be kept upright during loading of this cargo. This cargo shall be so trimmed to the boundaries of the cargo space that the angle of the surface of the cargo with the horizontal plane does not exceed 25 degrees. Both the specific gravity and the flow characteristics of this cargo are dependent on the volume of air in the cargo. The volume of air in this cargo may be up to 12%. This cargo shows fluid state prior to settlement. The ship carrying this cargo shall not depart until the cargo has settled. After the settlement, shifting of the cargo is not liable to occur unless the angle of the surface with the horizontal plane exceeds 30 degrees.

# PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

# VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

# CARRIAGE

After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed, as necessary. All vents and access ways to the cargo spaces shall be shut during the voyage. Bilges in the cargo spaces carrying this cargo shall not be pumped unless special precautions are taken.

# DISCHARGE

No special requirements.

# **CLEAN-UP**

In the case that the residues of this cargo are to be washed out, the cargo spaces and the other structures and equipment which may have been in contact with this cargo or its dust shall be thoroughly swept prior to washing out. Particular attention shall be paid to bilge wells and framework in the cargo spaces. The fixed bilge pumps shall not be used to pump the cargo spaces, because this cargo may make the bilge systems inoperative.

# **CEMENT CLINKERS**

# DESCRIPTION

Cement is formed by burning limestone with clay. This burning produces rough cinder lumps that are later crushed to a fine powder to produce cement. The rough cinder lumps are called clinker and are shipped in this form to avoid the difficulties of carrying cement powder.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1190 to 1639	0.61 to 0.84
SIZE	CLASS	GROUP
0 mm to 40 mm	Not applicable	С

# HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & SEGREGATION**

No special requirements.

# 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 and 5 of the Code.

# PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

# VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

# CARRIAGE

After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed. All vents and access ways to the cargo spaces shall be shut during the voyage. Bilges in the cargo spaces carrying this cargo shall not be pumped unless special precautions are taken.

#### DISCHARGE

No special requirements.

# **CLEAN-UP**

In the case that the residues of this cargo are to be washed out, the cargo spaces and the other structures and equipment which may have been in contact with this cargo or its dust shall be thoroughly swept prior to washing out.

# CHAMOTTE

#### DESCRIPTION

Burned clay. Grey. Shipped in the form of fine crushed stone. Used by zinc smelters and in manufacture of firebrick (road metal). Dusty.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	667	1.50
SIZE	CLASS	GROUP
Up to 10 mm	Not applicable	С

# HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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.

# CHARCOAL

# DESCRIPTION

Wood burnt at a high temperature with as little exposure to air as possible. Very dusty, light cargo. Can absorb moisture to about 18 to 70% of its weight. Black powder or granules.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	199	5.02
SIZE	CLASS	GROUP
_	MHB	В

# HAZARD

May ignite spontaneously. Contact with water may cause self-heating. Liable to cause oxygen depletion in the cargo space. Hot charcoal screenings in excess of  $55^{\circ}$ C should not be loaded.

# **STOWAGE & SEGREGATION**

Segregation as required for class 4.1 materials. "Separated from" oily 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 and 5 of the Code.

# PRECAUTIONS

Charcoal in class 4.2 shall not be carried in bulk. This cargo shall be exposed to the weather for not less than 13 days prior to shipment. Prior to loading, the manufacturer or shipper shall give the master a certificate stating that the cargo is not class 4.2 in accordance with the result of the test approved by the competent authority<sup>\*</sup>. The certificate shall also state that this cargo have been weathered for not less than 13 days. This cargo shall only be accepted for loading when the actual moisture content of the cargo is not more than 10%.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

<sup>\*</sup> Reference is made in section 6 of appendix 2 to this Code.

**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

Nil

# **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.

# **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

# CHOPPED RUBBER AND PLASTIC INSULATION

# DESCRIPTION

Plastic and rubber insulation material, clean and free from other materials, in granular form

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	500 - 570	1.76 - 1.97
SIZE	CLASS	GROUP
Granular 1 to 4 mm	Not applicable	С

# HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & 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

During handling and carriage no hotwork, burning and smoking shall be permitted in the vicinity of the cargo spaces containing this cargo. Prior to shipment, a certificate shall be given to the master by the shipper stating that this cargo consists of clean plastic and rubber material only. When the planned interval between the commencement of loading and the completion of discharge of this cargo exceeds 5 days, the cargo shall not be accepted for loading unless the cargo is to be carried in cargo spaces fitted with a fixed gas fire extinguishing system. The administration may, if it considers that the planned voyage does not exceed 5 days from the commencement of loading to the completion of discharge, exempt from the requirements of a fitted fixed gas fire-extinguishing system in the cargo spaces for the carriage of this cargo.

# VENTILATION

No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

CLEAN-UP No special requirements. I:\MSC\84\24-Add-3.doc

#### **CHROME PELLETS**

#### DESCRIPTION

Pellets. Moisture: up to 2% maximum.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1667	0.6
SIZE	CLASS	GROUP
8 to 25 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & 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.

# CHROMITE ORE

#### **DESCRIPTION**

Concentrates or lumpy, dark grey in colour.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2222 to 3030	0.33 to 0.45
SIZE	CLASS	GROUP
Up to 254 mm	Not applicable	С

#### HAZARD

Toxic by dust inhalation. This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

No special requirements.
# DISCHARGE

No special requirements.

# **CLEAN-UP**

No special requirements.

## CLAY

## DESCRIPTION

Clay is usually light to dark grey and comprises 10% soft lumps and 90% soft grains. The material is usually moist but not wet to the touch. Moisture is up to 25%.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	746 to 1515	0.66 to 1.34
SIZE	CLASS	GROUP
Up to 150 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

## PRECAUTIONS

The moisture content of this cargo shall be kept as low as practicable to prevent the cargo becoming glutinous and handling of the cargo becoming extremely difficult.

## VENTILATION

No special requirements.

## CARRIAGE

No special requirements.

## DISCHARGE

No special requirements.

## **CLEAN-UP**

Prior to washing out the residues of this cargo, the bilge wells of the cargo spaces shall be cleaned.

## COAL

#### (See also the appendix to this schedule)

## DESCRIPTION

Coal (bituminous and anthracite) is a natural, solid, combustible material consisting of amorphous carbon and hydrocarbons.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	654 to 1266	0.79 to 1.53
SIZE	CLASS	GROUP
Up to 50 mm	MHB	B (and A)

## HAZARDS

Coal may create flammable atmospheres, may heat spontaneously, may deplete the oxygen concentration, may corrode metal structures. Can liquefy if predominantly fine 75% less than 5 mm coal.

## **STOWAGE & SEGREGATION**

Refer to the appendix to this schedule.

## HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

When a cargo may liquefy during voyage in case that the moisture content of the cargo is in excess of its TML and the cargo is carried in a ship other than 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 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 provided that the actual moisture content of the cargo is sufficiently less than its TML so that the actual moisture content is not liable to be increased beyond the TML by the precipitation; 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.

Without reasonable trimming, vertical cracks into the body of the coal may form permitting oxygen circulation and possible self-heating.

## PRECAUTIONS

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Refer to the appendix to this schedule.

## VENTILATION

Refer to Special Precautions in the appendix to this schedule.

## CARRIAGE

Refer to the appendix to this schedule.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

## **EMERGENCY PROCEDURES**

## **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Nil

## **EMERGENCY PROCEDURES**

Nil

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down. Exclusion of air may be sufficient to control the fire. **Do not use water**. Seek expert advice and consider heading to the nearest port.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## REMARKS

The use of CO<sub>2</sub> or inert gas, if available, should be withheld until fire is apparent.

## APPENDIX

## COAL

## **Properties and characteristics**

- 1. Coals may emit methane, a flammable gas. A methane/air mixture containing between 5% and 16% methane constitutes an explosive atmosphere which can be ignited by sparks or naked flame, e.g., electrical or frictional sparks, a match or lighted cigarette. Methane is lighter than air and may, therefore, accumulate in the upper region of the cargo space or other enclosed spaces. If the cargo space boundaries are not tight, methane can seep through into spaces adjacent to the cargo space.
- 2. Coals may be subject to oxidation, leading to depletion of oxygen and an increase in carbon dioxide or carbon monoxide concentrations in the cargo space. Carbon monoxide is an odourless gas, slightly lighter than air, and has flammable limits in air of 12% to 75% by volume. It is toxic by inhalation with an affinity for blood haemoglobin over 200 times that of oxygen.
- 3. Some coals may heat spontaneously and the spontaneous heating may lead to spontaneous combustion in the cargo space. Flammable and toxic gases, including carbon monoxide, may be produced.
- 4. Some coals may be liable to react with water and produce acids which may cause corrosion. Flammable and toxic gases, including hydrogen, may be produced. Hydrogen is an odourless gas, much lighter than air, and has flammable limits in air of 4% to 75% by volume.

## Segregation and stowage requirements

- 1. Boundaries of cargo spaces where this cargo is carried *shall* be resistant to fire and liquids.
- 2. This cargo *shall* be "separated from" goods of classes 1 (Division 1.4), 2, 3, 4 and 5 in packaged form (see IMDG Code) and "separated from" solid bulk materials of classes 4 and 5.1.
- 3. Stowage of goods of class 5.1 in packaged form or solid bulk materials of class 5.1 above or below this cargo *shall* be prohibited.
- 4. The master *shall* ensure that this cargo is not stowed adjacent to hot areas.
- 5. This cargo *shall* be "separated longitudinally by an intervening complete compartment or hold from" goods of class 1 other than Division 1.4.

Note: For interpretation of these terms, see section 9.

## General requirements for all types of these cargoes

- 1. Prior to loading, the shipper or his appointed agent shall provide in writing to the master the characteristics of the cargo and the recommended safe handling procedures for loading and transport of the cargo. As a minimum, the cargo's contract specifications for moisture content, sulphur content and size shall be stated, and especially whether the cargo may be liable to emit methane or self-heat.
- 2. Before loading, the master *shall* ensure the following:
- 2.1 All cargo spaces and bilge wells are clean and dry. Any residue of waste material or previous cargo is removed, including removable cargo battens; and
- 2.2 All electrical cables and components situated in cargo spaces and adjacent spaces are free from defects. Such cables and electrical components are safe for use in an explosive atmosphere or positively isolated.

- 3. The ship *shall* be suitably fitted and carry on board appropriate instruments for measuring the following without requiring entry in the cargo space:
  - .1 concentration of methane in the atmosphere;
  - .2 concentration of oxygen in the atmosphere;
  - .3 concentration of carbon monoxide in the atmosphere; and
  - .4 pH value of cargo space bilge samples.
- 4. These instruments *shall* be regularly serviced and calibrated. Ship personnel *shall* be trained in the use of such instruments. Details of gas measurement procedures are given at the end of this appendix.
- 5. It is recommended that means be provided for measuring the temperature of the cargo in the range 0°C to 100°C to enable the measurement of temperature of the cargo while being loaded and during voyage without requiring entry into the cargo space.
- 6. Smoking and the use of naked flames *shall* not be permitted in the cargo areas and adjacent spaces and appropriate warning notices *shall* be posted in conspicuous places. Burning, cutting, chipping, welding or other sources of ignition *shall* not be permitted in the vicinity of cargo spaces or in other adjacent spaces, unless the space has been properly ventilated and the methane gas measurements indicate it is safe to do so.
- 7. Prior to departure, the master shall be satisfied that the surface of the material has been trimmed reasonably level to the boundaries of the cargo space to avoid the formation of gas pockets and to prevent air from permeating the body of the briquettes. Casings leading into the cargo space *shall* be adequately sealed. The shipper *shall* ensure that the master receives the necessary co-operation from the loading terminal.
- 8. The atmosphere in the space above the cargo in each space *shall* be regularly monitored for the concentration of methane, oxygen and carbon monoxide. Details of gas monitoring procedures are given at the end of this appendix. The results of monitoring shall be recorded. The frequency of the monitoring *shall* be determined based upon the information provided by the shipper and the information obtained through the analysis of the atmosphere in the cargo space.
- 9. Unless expressly provided otherwise, surface ventilation shall be conducted in all cargo spaces carrying this cargo for the first 24 hours after departure from the loading port. During this period, the atmosphere in the cargo spaces *shall* be monitored once from one sample point per cargo space and for the purpose of the gas monitoring, the ventilation shall be stopped for an appropriate period prior to the gas monitoring.
- 10. When the methane concentrations monitored within 24 hours after departure are at an acceptably low level, the ventilation openings *shall* be closed and the atmosphere in the cargo spaces shall be monitored. When the methane concentrations monitored within 24 hours after departure are not at an acceptably low level, surface ventilation *shall* be maintained, except for an appropriate period for gas monitoring, and the atmosphere in the cargo spaces shall be monitored. This procedure shall be followed until the methane concentrations become acceptably low level. In either event, the atmosphere in the cargo spaces *shall* be monitored on a daily basis.
- 11. When significant concentrations of methane is subsequently observed in unventilated cargo spaces, the appropriate special precautions for coals emitting methane *shall* apply.
- 12. The master *shall* ensure, as far as practicable, that any gases which may be emitted from this cargo do not accumulate in adjacent enclosed spaces.
- 13. The master *shall* ensure that enclosed working spaces such as storerooms, carpenter's shop, passageways, tunnels, etc. are regularly monitored for the presence of methane, oxygen and carbon monoxide. Such spaces *shall* be adequately ventilated.

- 14. Regular hold bilge testing *shall* be systematically carried out during voyage carrying this cargo. If the pH monitoring indicates that a corrosion risk exists, bilges shall be frequently pumped out during the voyage in order to avoid possible accumulation of acids on tank tops and in the bilge system.
- 15. If the behaviour of the cargo during the voyage differs from that specified in the cargo declaration, the master *shall* report such differences to the shipper. Such reports will enable the shipper to maintain records on the behaviour of the coal cargoes, so that the information provided to the master can be reviewed in the light of transport experience.

## **Special Precautions**

## *1 Coals emitting methane*

When the shipper has informed that the cargo is liable to emit methane or analysis of the atmosphere in the cargo space indicates the presence of methane in excess of 20% of the Lower Explosion Limit (LEL), the following additional precautions *shall* be taken:

- .1 Adequate surface ventilation *shall* be maintained, except for an appropriate period for the purpose of gas monitoring.
- .2 Care *shall* be taken to remove any accumulated gases prior to operation of the hatch covers or other openings for any reason, including discharging. Care shall be taken to operate hatch covers of the cargo spaces and other openings to avoid creating sparks. Smoking and the use of naked flame *shall* be prohibited.
- .3 Personnel *shall* not be permitted to enter the cargo space or enclosed adjacent spaces unless the space has been ventilated and the atmosphere tested and found to be gas-free and to have sufficient oxygen to support life. Notwithstanding this provision, emergency entry into the cargo space may be permitted without ventilation, testing the atmosphere or the both, provided that the entry into the cargo space is undertaken only by trained personnel wearing self-contained breathing apparatus under the supervision of a responsible officer and special precautions are observed to ensure that no source of ignition is carried into the space.
- .4 The master *shall* ensure that enclosed working spaces such as storerooms, carpenter's shops, passageways, tunnels, etc. are regularly monitored for the presence of methane. Such spaces *shall* be adequately ventilated and, in the case of mechanical ventilation, only equipment safe for use in an explosive atmosphere *shall* be used.

## 2 Self-heating coals

When the shipper informed that the cargo is likely to self-heat or analysis of the atmosphere in the cargo space indicates an increasing concentration of carbon monoxide, then the following additional precautions *shall* be taken:

- .1 The cargo spaces *shall* be closed immediately after completion of loading in each cargo space. The hatch covers may also be additionally sealed with a suitable sealing tape. Only natural surface ventilation shall be permitted and ventilation *shall* be limited to the absolute minimum time necessary to remove methane which may have accumulated.
- .2 Personnel *shall* not enter the cargo space during voyage, unless they are wearing self-contained breathing apparatus and access is critical to safety of life and the safety of the ship.
- .3 Prior to loading, temperature of this cargo shall be monitored. This cargo shall only be accepted for loading when the temperature of the cargo is not higher than 55°C.

- .4 When the carbon monoxide level is increasing steadily, a potential self-heating may be developing. In such a case, the cargo space *shall* be completely closed and all ventilation ceased, and the master *shall* seek expert advice immediately. Water *shall* not be used for cooling material or fighting coal cargo fires at sea, but may be used for cooling the boundaries of the cargo space.
- .5 When the carbon monoxide level in any cargo space reaches 50 ppm or exhibit a steady rise over three consecutive days, a self-heating condition may be developing and the master shall inform the shipper and the company of, at least, the following information after an accurate assessment of the situation is to be achieved:
  - (a) identity of the cargo spaces involved; monitoring results covering carbon monoxide, methane and oxygen concentrations;
  - (b) if available, temperature of the cargo, location and method used to obtain results;
  - (c) time gas sample taken (monitoring routine);
  - (d) time ventilators opened/closed;
  - (e) quantity of coal in hold(s) involved;
  - (f) type of coal as per cargo information, and any special precautions indicated on information;
  - (g) date loaded, and ETA at intended discharge port (which *shall* be specified); and
  - (h) comments or observations from the ship's master.

## Procedures for gas monitoring of coal cargoes

## 1 Observations

1.1 Carbon monoxide monitoring, when conducted in accordance with the following procedures, will provide a reliable early indication of self-heating within this cargo. This allows preventive action to be considered without delay.

A steady rise in the level of carbon monoxide detected within a cargo space is a conclusive indication that self-heating is taking place.

1.2 All vessels engaged in the carriage of this cargo *shall* carry on board an instrument for measuring methane, oxygen and carbon monoxide gas concentrations, to enable the monitoring of the atmosphere within the cargo space. This instrument *shall* be regularly serviced and calibrated in accordance with the manufacturer's instructions. Care shall be exercised in interpreting methane measurements carried out in the low oxygen concentrations often found in unventilated cargo holds. The catalytic sensors normally used for the detection of methane rely on the presence of sufficient oxygen for accurate measurement. This phenomenon does not affect the measurement of carbon monoxide, or measurement of methane by infrared sensor. Further guidance may be obtained from the instrument manufacturer.

## 2 Sampling and measurement procedure

## 2.1 Equipment

2.1.1 An instrument which is capable of measuring methane, oxygen and carbon monoxide concentrations shall be provided on board a ship carrying this cargo. The instrument *shall* be fitted with an aspirator, flexible connection and a length of spark-proof metal tubing to enable a representative sample to be obtained from within the square of the hatch.

2.1.2 When recommended by the manufacturer, a suitable filter *shall* be used to protect the instrument against the ingress of moisture. The presence of even a small amount of moisture will compromise the accuracy of the measurement.

## 2.2 Siting of sampling points

2.2.1 In order to obtain meaningful information about the behaviour of this cargo in a cargo space, gas measurements *shall* be made via one sample point per cargo space. To ensure flexibility of measurement in adverse weather two sample points *shall* be provided per cargo space, one on the port side and one on the starboard side of the hatch cover or hatch coaming. (Refer to the diagram of gas sampling point.) Measurement from either of these locations is satisfactory.



Diagram of gas sampling point

2.2.2 Each sample point *shall* comprise a hole of diameter approximately 12 mm positioned as near to the top of the hatch coaming as possible. It *shall* be sealed with a sealing cap to prevent ingress of water and air. It is essential that this cap is securely replaced after each measurement to maintain a tight seal.

2.2.3 The provisions of any sample point *shall* not compromise the seaworthiness of the vessel.

## 2.3 Measurement

The explanation on procedures for measurement is as follows:

- .1 remove the sealing cap, insert the spark-proof metal tube into the sampling point and tighten the collar to ensure an adequate seal;
- .2 connect the instrument to the sampling tube;

- .3 draw a sample of the atmosphere through the tube, using the aspirator, until steady readings are obtained;
- .4 log the results on a form which records cargo space, date and time for each measurement; and
- .5 put back the sealing cap.

## 2.4 Measurement strategy

The identification of incipient self-heating from measurement of gas concentrations is more readily achieved under unventilated conditions. This is not always desirable because of the possibility of the accumulation of methane to dangerous concentrations. This is primarily, but not exclusively, a problem in the early stages of a voyage. Therefore it is recommended that cargo spaces are initially ventilated until measured methane concentrations are at an acceptably low level.

## 2.5 Measurement in unventilated holds

Under normal conditions one measurement per day is sufficient as a precautionary measure. However, if carbon monoxide levels are higher than 30 ppm then the frequency *shall* be increased to at least twice a day at suitably spaced intervals. Any additional results *shall* be logged.

## 2.6 Measurement in ventilated holds

2.6.1 If the presence of methane is such that the ventilators are required to remain open, then a different procedure *shall* be applied to enable the onset of any incipient self-heating to be detected.

2.6.2 To obtain meaningful data the ventilators *shall* be closed for a period before the measurements are taken. This period may be chosen to suit the operational requirements of the vessel, but it is recommended that it is not less than four hours. It is vital in the interests of data interpretation that the shutdown time is constant whichever time period is selected. These measurements *shall* be taken on a daily basis.

## COAL SLURRY

#### DESCRIPTION

Coal slurry is a mixture of fine particles of coal and water.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	870 to 1020	0.98 to 1.15
SIZE	CLASS	GROUP
Under 1 mm	Not applicable	А

#### HAZARD

Coal slurry is liable to liquefy during sea transport. Spontaneous combustion is possible if the coal dries out but is unlikely under normal conditions.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

No special requirements.

## 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 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 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 provided that the actual moisture content of the cargo is sufficiently less than its TML so that the actual moisture content is not liable to be increased beyond the TML by the precipitation; 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.

## VENTILATION

As this cargo, in general, may emit methane, the cargo spaces carrying this cargo shall be tested regularly using a suitable gas detector and natural surface ventilation shall be conducted, as necessary.

## 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.

## **COARSE CHOPPED TYRES**

#### DESCRIPTION

Chopped or shredded fragments of used tyres in coarse size.

#### **CHARACTERISTICS**

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	555	1.8
SIZE	CLASS	GROUP
15x20 cm approximately	Not applicable	С

#### HAZARD

May self-heat slowly if contaminated by oily residual, if not properly aged before shipment and if offered to the shipment in smaller size than indicated in "characteristics". This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

No special requirements.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

During handling and carriage no hotwork, burning and smoking shall be permitted in the vicinity of the cargo spaces containing this cargo. Prior to shipment, a certificate shall be given to the master by the shipper stating that this cargo is free of oily products or oily residual and has been stored under cover but in the open air for not less than 15 days prior to shipment.

When the planned interval between the commencement of loading and the completion of discharge of this cargo exceeds 5 days, the cargo shall not be accepted for loading unless the cargo is to be carried in cargo spaces fitted with a fixed gas fire extinguishing system. The administration may, if it considers that the planned voyage does not exceed 5 days from the commencement of loading to the completion of discharge, exempt from the requirements of a fitted fixed gas fire-extinguishing system in the cargo spaces for the carriage of this cargo.

## **VENTILATION**

No special requirements.

**CARRIAGE** No special requirements.

## **DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

## COKE

#### **DESCRIPTION**

Grey lumps may contain fines (Breeze).

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	341 to 800	1.25 to 2.93
SIZE	CLASS	GROUP
Up to 200 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

## VENTILATION

No special requirements.

CARRIAGE No special requirements.

# DISCHARGE

No special requirements.

## **CLEAN-UP**

After discharge of this cargo, the bilge wells and the scuppers of the cargo spaces shall be checked and any blockage in the bilge wells and the scuppers shall be removed.

## **COKE BREEZE**

#### DESCRIPTION

Greyish powder.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	556	1.8
SIZE	CLASS	GROUP
less than 10 mm	Not applicable	А

#### HAZARD

Coke Breeze is liable to flow if it has sufficiently high moisture content. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

No special requirements.

#### HOLD CLEANLINESS

No special requirements.

## WEATHER PRECAUTIONS

When a cargo is carried in a ship other than 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 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 provided that the actual moisture content of the cargo is sufficiently less than its TML so that the actual moisture content is not liable to be increased beyond the TML by the precipitation; 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.

## 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**

After discharge of this cargo, the bilge wells and the scuppers of the cargo spaces shall be checked and any blockage in the bilge wells and the scuppers shall be removed.

## COLEMANITE

#### DESCRIPTION

A natural hydrated calcium borate. Fine to lumps, light grey appearance similar to clay. Moisture approximately 7%.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1639	0.61
SIZE	CLASS	GROUP
Up to 300 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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.

## **COPPER GRANULES**

## DESCRIPTION

Sphere shaped pebbles. 75% copper with lead, tin, zinc, traces of others. Moisture content 1.5% approximately. Light grey colour when dry, dark green when wet. Odourless.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	4000 to 4545	0.22 to 0.25
SIZE	CLASS	GROUP
Fines up to 10 mm Clinkers up to 50 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

**PRECAUTIONS** No special requirements.

**VENTILATION** No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

CLEAN-UP No special requirements. I:\MSC\84\24-Add-3.doc

## **COPPER MATTE**

#### **DESCRIPTION**

Crude black copper ore. Composed of 75% copper and 25% impurities. Small metallic round stones or pellets. Odourless.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2857 to 4000	0.25 to 0.35
SIZE	CLASS	GROUP
3 mm to 25 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

PRECAUTIONS

No special requirements.

# VENTILATION

No special requirements.

## CARRIAGE

No special requirements.

# DISCHARGE

No special requirements.

**CLEAN-UP** No special requirements.

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## COPRA (dry) UN 1363

## DESCRIPTION

Dried kernels of coconuts with a penetrating rancid odour which may taint other cargoes.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	500	2.0
SIZE	CLASS	GROUP
Not applicable	4.2	В

## HAZARD

Liable to heat and ignite spontaneously especially when in contact with water. Liable to cause oxygen depletion in the cargo space.

## **STOWAGE & SEGREGATION**

This cargo shall not be stowed on or adjacent to heated surfaces including fuel oil tanks.

## 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 and 5 of the Code. This cargo shall not be accepted for loading when wet.

## PRECAUTIONS

This cargo shall only be accepted for loading when the cargo has been weathered for at least one month before shipment or when the shipper provides the master with a certificate issued by a person recognized by the competent authority of the country of origin stating that the moisture content the cargo is not more than of 5%. Smoking and the use of naked lights in cargo spaces and adjacent areas shall be prohibited. Entry into the cargo space for this cargo shall not be permitted until the cargo space has been ventilated and the atmosphere tested for concentration of oxygen.

## VENTILATION

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo.

#### CARRIAGE

The temperature of this cargo shall be measured and recorded regularly during voyage to monitor for possible self heating.

## DISCHARGE

No special requirements.

#### **CLEAN-UP**

No special requirements.

## **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Nil

## **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.

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

## CRYOLITE

## DESCRIPTION

A fluoride of sodium and aluminium used in the production of aluminium and for ceramic glazes. Grey pellets.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1429	0.70
SIZE	CLASS	GROUP
6.4 mm to 12.7 mm	Not applicable	С

## HAZARD

Prolonged contact may cause serious damage to the skin and nervous system. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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** No special requirements.

**DISCHARGE** No special requirements.

CLEAN-UP

No special requirements.

## DIAMMONIUM PHOSPHATE (D.A.P.)

#### **DESCRIPTION**

Odourless white crystals or powder. Depending on source it can be dusty. Hygroscopic.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
30° to 40°	833 to 999	1.10 to 1.20
SIZE	CLASS	GROUP

#### HAZARD

No special hazards.

This cargo is non-combustible or has a low fire-risk.

This cargo is hygroscopic and may harden in the cargo space under humid conditions.

## **STOWAGE & SEGREGATION**

No special requirements.

#### 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 and 5 of the Code.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

#### CARRIAGE

Condensation in the cargo spaces carrying this cargo, sweating of this cargo and entering of water from hatch covers to the cargo spaces shall be checked regularly during the voyage. Due attention shall be paid to the sealing of hatches of the cargo spaces.

## DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

# **CLEAN-UP**

After discharge of this cargo, particular attention shall be paid to bilge wells of the cargo spaces.

## DIRECT REDUCED IRON (A) Briquettes, hot-moulded

## DESCRIPTION

A metallic grey colloid material emanating from a densification process whereby the direct reduced iron (DRI) feed material is at a temperature greater than  $650^{\circ}$ C at time of moulding and has a density greater than  $5.0 \text{ g/cm}^3$ . Fines (under 4 mm) not to exceed 5%.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	25003300	0.3 to 0.4
		To be verified by the shipper
SIZE	CLASS	GROUP
Approximate size: Length 90 mm to 130 mm Width 80 mm to 100 mm Thickness 20 mm to 50 mm Briquette weight 0.5 to 2.0 kg Fines: under 4 mm	MHB	В

## HAZARD

Material may slowly evolve hydrogen after contact with water. Temporary self-heating of about 30°C may be expected after material handling in bulk.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" goods of classes 1 (Division 1.4), 2, 3, 4 and 5 and class 8 acids in packaged form (see IMDG Code).

"Separated from" solid bulk materials of classes 4 and 5.

"Separated longitudinally by an intervening complete compartment or hold from" goods of class 1 other than Division 1.4 C.

Boundaries of compartments where this cargo is carried shall be resistant to fire and liquid.

## HOLD CLEANLINESS

The cargo spaces shall be clean, dry and free from salt and residues of previous cargoes.

## WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable during loading and the voyage. Open storage is acceptable prior to loading. This cargo shall not be loaded during precipitation. During loading 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 and 5 of the Code.

Due consideration shall be paid to evenly spreading the cargo across the tanktop to minimize the concentration of fines. This cargo shall not be loaded when the temperature is in excess of  $65^{\circ}C$  (150°F). Prior to loading wooden fixtures such as battens shall be removed.

## PRECAUTIONS

Prior to loading this cargo, the shipper shall provide the master with a certificate issued by a person recognized by the competent authority of the country of shipment stating that the cargo, at the time of loading, is suitable for shipment and does not contain fines more than 5%. Where practicable, ballast tanks adjacent to the cargo spaces containing this cargo, other than double-bottom tanks, shall be kept empty. Weather deck closures shall be inspected and tested to ensure integrity. During discharge, a fine spray of fresh water may be applied to this cargo for dust control. The cargo temperature shall be monitored during loading. The shipper may provide advice in amplification of this Code but the advice shall not be contrary thereto in respect of safety.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary. Radars and exposed radio communication equipment of the ship which carry this cargo shall be protected from the dust of this cargo. 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. Cargo spaces containing this cargo may become oxygen-depleted and precautions shall be taken upon entering the cargo. Cargo spaces containing this cargo and adjacent spaces may become oxygen-depleted. Flammable gas may also build up in these spaces. All precautions shall be taken upon entering these spaces.

## VENTILATION

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo. Ventilation shall be such that escaping gases cannot penetrate living quarters on or under deck.

## CARRIAGE

For quantitative measurements of hydrogen, a suitable detector shall be on board while this cargo is carried. The detector shall be suitable for use in an atmosphere without oxygen and of certified safe type for use in explosive atmosphere. The concentrations of hydrogen 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.

## DISCHARGE

No special requirements.

**CLEAN-UP** No special requirements.

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## **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Nil

## **EMERGENCY PROCEDURES**

Nil

#### **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down. **Do not use water**. Seek expert advice. Early application of an inert gas to a smouldering situation may be effective. Preparations should be made for grab discharge if serious heating occurs.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## **DIRECT REDUCED IRON (B)**

# (not to be confused with iron sponge, spent) such as lumps, pellets and cold-moulded briquettes

## **DESCRIPTION**

Direct Reduced Iron (DRI) (B) is a metallic material of a manufacturing process formed by the reduction (removal of oxygen) of iron oxide at temperatures below the fusion point of iron. Cold-moulded briquettes should be defined as those which have been moulded at a temperature of under  $650^{\circ}$ C or which have a density of less than 5.0 g/cm<sup>3</sup>.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	More than 2000	Up to 0.5
SIZE	CLASS	GROUP
Lumps and pellets: Average particle size 6 mm to 25 mm with up to 5% fines (under 4 mm) Cold-moulded briquettes: Approximate maximum dimensions 35 mm to 40 mm	MHB	В

## HAZARD

DRI may react with water and air to produce hydrogen and heat. The heat produced may cause ignition. Oxygen in an enclosed space may be depleted.

## **STOWAGE & SEGREGATION**

"Separated from" goods of classes 1 (Division 1.4S), 2, 3, 4 and 5 and class 8 acids in packaged form (see IMDG Code).

"Separated from" solid bulk materials of classes 4 and 5. Goods of class 1, other than Division 1.4S, should not be carried in the same ship.

Boundaries of compartments where this cargo is carried shall be resistant to fire and liquid.

## HOLD CLEANLINESS

The cargo spaces shall be clean, dry and free from salt and residues of previous cargoes. Wooden fixtures such as battens shall be removed.

## WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## LOADING

Where practicable, adjacent ballast tanks, other than double-bottom tanks, shall be kept empty. Weather deck closures shall be inspected and tested to ensure integrity. This cargo shall not be accepted for loading if the temperature is in excess of  $65^{\circ}$ C ( $150^{\circ}$ F).

## PRECAUTIONS

Prior to loading this cargo, the shipper shall provide the master with a certificate issued by a person recognized by the competent authority of the country of shipment stating that the cargo, at the time of loading, is suitable for shipment. Shippers shall certify that the cargo conforms to the requirement of this Code. Prior to shipment, this cargo shall be aged for at least 72 hours, or treated with an air passivation technique, or some other equivalent method that reduces the reactivity of the material to at least the same level as the aged product. Hatches of the cargo space for this cargo shall be sealed. All ventilators and other openings of the cargo spaces shall be closed to maintain an inert atmosphere.

- A. The shipper shall provide necessary specific instructions for carriage, either:
  - 1. prior to loading, provision should be made to introduce the inert gas at tank top level so that the whole of the cargo space can be maintained at a low oxygen level throughout the voyage. The cargo spaces shall be maintained under an inert atmosphere containing less than 5% oxygen. The hydrogen content of the atmosphere in the cargo spaces shall be maintained at less that 1% by volume; or
  - 2. that the cargo has been manufactured or treated with an oxidation and corrosion-inhibiting process which has been proved, to the satisfaction of the competent authority, to provide effective protection against dangerous reaction with seawater or air under shipping conditions.
- B. The provision of paragraph A above may be waived or varied if agreed to by the competent authorities of the countries concerned, taking into account the sheltered nature, length, duration, or any other applicable conditions of any specific voyage.

The ship selected for the carriage of this cargo shall be suitable in all respects for the carriage of this cargo. Except as provided for under paragraph A2 above, any material which is wet or is known to have been wetted should not be accepted for carriage in bulk. The cargo shall be loaded, stowed and transported under dry conditions.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary. Radars and exposed radio communication equipment of the ship which carry this cargo shall be protected from the dust of this cargo.

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Cargo spaces containing this cargo and adjacent spaces may become oxygen-depleted. Flammable gas may also build up in these spaces. All precautions shall be taken upon entering these spaces.

## VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

For quantitative measurements of oxygen and hydrogen, suitable detectors for each gas or combination of gases shall be on board while this cargo is carried. The detectors shall be suitable for use in an atmosphere without oxygen and 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.

No smoking, burning, cutting, chipping or other source of ignition shall be allowed in the vicinity of the cargo spaces containing this cargo.

## DISCHARGE

No special requirements.

## **CLEAN-UP**

No special requirements.

## **EMERGENCY PROCEDURES**

## **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Nil

## **EMERGENCY PROCEDURES**

#### Nil

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down. **Do not use water.** Seek expert advice. Early application of an inert gas to a smouldering situation may be effective. If a fire situation develops, the ship should make for the nearest suitable port and neither water, steam nor additional carbon dioxide should be used at this stage. If nitrogen gas is available, the use of this gas to keep the oxygen concentration down will contain the fire.

Preparations should be made for grab discharge if serious heating occurs.

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

## DOLOMITE

## **DESCRIPTION**

Dolomite is a light yellow/brown coloured mineral stone which is very hard and compact. Dolomite may sometimes, incorrectly, be used to describe a material consisting of the oxides of calcium and magnesium (dolomitic quicklime). In this case, see "LIME (UNSLAKED)".

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1429 to 1667	0.6 to 0.7
SIZE	CLASS	GROUP
Up to 32 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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.

## FELSPAR LUMP

## **DESCRIPTION**

Crystalline minerals consisting of silicates of aluminium with potassium sodium, calcium and barium. White or reddish in colour.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1667	0.60
SIZE	CLASS	GROUP
0.1 mm to 300 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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.

## FERROCHROME

## DESCRIPTION

Raw material of iron mixed with chrome. Extremely heavy cargo.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	3571 to 5556	0.18 to 0.26
SIZE	CLASS	GROUP
Up to 300 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

**PRECAUTIONS** No special requirements.

**VENTILATION** No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

## FERROCHROME, exothermic

#### **DESCRIPTION**

An alloy of iron and chromium. Extremely heavy cargo.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	3571 to 5556	0.18 to 0.28
SIZE	CLASS	GROUP
Up to 300 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

## PRECAUTIONS

During loading, carriage and discharging, welding or other hot work shall not be carried out in the vicinity of the cargo spaces containing this cargo.

## VENTILATION

No special requirements.

## CARRIAGE

No special requirements.

## DISCHARGE

No special requirements.

## **CLEAN-UP** No special requirements.

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## FERROMANGANESE

#### DESCRIPTION

Raw material or iron mixed with manganese.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	3571 to 5556	0.18 to 0.28
SIZE	CLASS	GROUP
Up to 300 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

**PRECAUTIONS** No special requirements.

**VENTILATION** No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.
#### FERRONICKEL

#### **DESCRIPTION**

An alloy of iron and nickel.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	4167	0.24
SIZE	CLASS	GROUP
Up to 300 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

**PRECAUTIONS** No special requirements.

**VENTILATION** No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

# **FERROPHOSPHORUS** (including briquettes)

#### **DESCRIPTION**

An alloy of iron and phosphorus used in the steel industry.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	5000	(0.2 for briquettes)
SIZE	CLASS	GROUP
Diameter: 2.54 mm	MHB	В

### HAZARD

May evolve flammable and toxic gases (e.g. phosphine) in contact with water. This cargo is non-combustible or has a low fire-risk.

### **STOWAGE & SEGREGATION**

Segregation as for class 4.3 materials. "Separated from" foodstuffs and class 8 liquids.

### 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 and 5 of the Code.

As the density of the cargo is extremely high, the tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

This cargo shall be kept as dry as reasonably practicable.

#### VENTILATION

Mechanical ventilation shall be conducted during the voyage for the cargo spaces carrying this cargo. Ventilation fans shall be of certified safe type for use in a flammable atmosphere. They shall normally be run continuously whenever this cargo is on board. Where this is impracticable, they shall be operated as weather permits and in any case for a reasonable period prior to discharge.

### CARRIAGE

No special requirements.

### DISCHARGE

No special requirements.

# **CLEAN-UP**

After discharge of this cargo, the cargo spaces shall be swept clean. Water shall not be used for cleaning of the cargo space which has contained this cargo, because of danger of gas.

### **EMERGENCY PROCEDURES**

### **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Self-contained breathing apparatus.

# EMERGENCY PROCEDURES

Wear self-contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down and use CO<sub>2</sub> if available. **Do not use water.** 

# **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

#### **FERROSILICON UN 1408**

with 30% or more but less than 90% silicon (including briquettes) (see appendix to this schedule)

#### DESCRIPTION

Ferrosilicon is an extremely heavy cargo.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )		STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1389 to 2083		0.48 to 0.72
	(1111 to 1538 for briquettes)		(0.65 to 0.90 for briquettes)
SIZE	CLASS		GROUP
Up to 300 mm Briquettes	4.3	6.1	В

#### HAZARD

In contact with moisture or water it may evolve hydrogen, a flammable gas which may form explosive mixtures with air and may, under similar circumstances, produce phosphine and arsine, which are highly toxic gases.

This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs and all class 8 liquids.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

#### WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

#### 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo. Refer to the appendix to this schedule.

#### PRECAUTIONS

The manufacturer or the shipper shall provide the master with a certificate stating that, after manufacture, the cargo was stored under cover, but exposed to dry weather for not less than three days prior to shipment.

#### 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. Refer to the appendix to this schedule.

#### CARRIAGE

For quantitative measurements of hydrogen, phosphine and arsine, 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.

#### DISCHARGE

Refer to the appendix to this schedule.

#### **CLEAN-UP**

After discharge of this cargo, the cargo spaces shall be swept clean twice.

Water shall not be used for cleaning of the cargo space which has contained this cargo, because of danger of gas.

#### **EMERGENCY PROCEDURES**

#### SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Self-contained breathing apparatus.

# **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

#### **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down and use CO<sub>2</sub> if available. **Do not use water**.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

### APPENDIX

# GENERAL REQUIREMENTS FOR CARRIAGE OF FERROSILICON

- 1. Chapter II-2 of SOLAS requires fire-fighter's outfits, full chemical protective suits and self-contained breathing apparatus to be readily available on board.
- 2. Gas concentrations *shall* be measured, during the voyage, at least once during every eight hours at each outlet ventilator and in any other accessible space adjacent to the cargo space carrying this cargo and the results shall be recorded in the log-book. Facilities shall be provided to make accurate determinations of the gas concentrations at each outlet ventilator without danger to the operator.
- 3. Ventilation fans shall be in operation at all times from commencement of loading until the cargo space is free of ferrosilicon.
- 4. The bilge wells shall be in a clean, dry condition before loading. The bilge timbers shall be in good condition and covered with double burlap.
- 5. The bilge wells shall be opened up and the cargo space washed out after discharging. A gas check shall be made before commencement of washing out.

### **DETAILED REQUIREMENTS**

Prior to loading, the bulkheads to the engine room *shall* be inspected and approved by the competent authority as gastight and the safety of the bilge pumping arrangements shall be approved by the competent authority. Inadvertent pumping through machinery spaces *shall* be avoided.

- Where the bilge suction valve of the cargo space is located in the machinery space the valve shall be checked and the valve lid and seat lapped to a fine finish, as necessary. After re-assembly the valve shall be locked shut and a notice shall be placed adjacent to the valve warning against opening without the master's permission.
- (ii) All pipes passing through the cargo space *shall* be in good order and condition. Hold atmosphere sampling units *shall* be effectively blanked off.
- (iii) Electrical circuits for equipment in cargo spaces which is unsuitable for use in an explosive atmosphere shall be isolated by removal of links in the system other than fuses.
- (iv) The cargo spaces *shall* be ventilated by at least two separate fans which *shall* be explosion-proof and arranged so that the escaping gas flow is separated from electrical cables and components. The total ventilation *shall* be at least 6 air changes per hour, based on an empty cargo space.
- (v) Ventilator trunkings shall be in sound condition and so arranged to preclude interconnection of the atmosphere in the cargo space with other cargo spaces, accommodation or work areas.

#### **OPERATIONAL REQUIREMENTS**

- (i) Smoking and naked flame shall be prohibited on deck in the vicinity of the cargo space or in the cargo space itself during loading or discharging.
- (ii) Any portable lighting shall be safe for use in an explosive atmosphere.
- (iii) The cargo shall be kept dry and during wet weather conditions cargo handling shall be suspended and the cargo space shall be closed.
- (iv) Sets of self-contained breathing apparatus shall be located and stored for immediate use together with lifeline and a gas detector.
- (v) Prior to commencement of discharging, the atmosphere in the cargo space shall be tested for the presence of toxic and flammable gases.

- (vi) Checks for contaminant gases shall be carried out at 30-minute intervals while persons are in the cargo space.
- (vii) Entry into the cargo space shall be prohibited when gas concentrations exceed the Threshold Limit Values, for phosphine (0.3 ppm) for arsine (0.05 ppm) or where the oxygen level is below 18%.

### GASES RELEASES FROM FERROSILICON IMPURITIES WHEN WATER IS ADDED

### (i) Arsine

Arsine is a toxic, colourless gas with a garlic like odour.

### Toxicity

Arsine is a nerve and blood poison. There is generally a delay before the onset of symptoms (sometimes a day or so). These are at first indefinite.

### Symptoms

1 Feeling of malaise, difficulty in breathing, severe headache, giddiness, fainting fits, nausea, vomiting and gastric disturbances.

2 In severe cases, vomiting may be pronounced, the mucous membranes may have a bluish discolouration and urine is dark and bloodstained. After a day or so there is severe anaemia and jaundice.

# Concentration

A concentration of 500 ppm is lethal to humans after exposure of a few minutes, while concentrations of 250 ppm are dangerous to life after 30 minutes exposure. Concentrations of 6.25 to 15.5 ppm are dangerous after exposure of 30 to 60 minutes. A concentration of 0.05 ppm is the threshold long limit to which a person may be exposed.

#### (ii) Phosphine

Phosphine is colourless, flammable and highly toxic and has the odour of rotting fish.

#### Toxicity

Phosphine acts on the central nervous system and the blood.

#### **Symptoms**

The symptoms exhibited by phosphine poisoning are an oppressed feeling in the chest, headache, vertigo, general debility, loss of appetite and great thirst. Concentrations of 2000 ppm for a few minutes and 400 to 600 ppm are dangerous to life. 0.3 ppm is the maximum concentration tolerable for several hours without symptoms.

No long term exposures to this gas *shall* be permitted.

#### **FERROSILICON**

25% to 30% silicon, or 90% or more with silicon (including briquettes) (See appendix to this schedule)

#### **DESCRIPTION**

Ferrosilicon is an extremely heavy cargo.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1389 to 2083	0.48 to 0.72
	(1111 to 1538 for briquettes)	(0.65 to 0.90 for briquettes)
SIZE	CLASS	GROUP
Diameter: 2.54 mm	MHB	В

### HAZARD

In contact with moisture or water it may evolve hydrogen, a flammable gas which may form explosive mixtures with air and may, under similar circumstances, produce phosphine and arsine, which are highly toxic gases.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

Segregation as required for class 4.3 materials. "Separated from" foodstuffs and all class 8 liquids.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

#### WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

#### LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. Stow evenly across tank tops. Refer to the appendix to this schedule.

#### PRECAUTIONS

The manufacturer or the shipper shall provide the master with a certificate stating that, after manufacture, the cargo was stored under cover, but exposed to open air for not less than three days prior to shipment.

#### 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. Refer to the appendix to this schedule.

### CARRIAGE

For quantitative measurements of hydrogen, phosphine and arsine, 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.

### DISCHARGE

Refer to the appendix to this schedule.

### **CLEAN-UP**

After discharge of this cargo, the cargo spaces shall be swept clean twice. Water shall not be used for cleaning of the cargo space which has contained this cargo, because of danger of gas.

# **EMERGENCY PROCEDURES**

# SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Self-contained breathing apparatus.

# **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down and use  $CO_2$  if available. Do not use water.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

### APPENDIX

# GENERAL REQUIREMENTS FOR CARRIAGE OF FERROSILICON

- 1. Two sets of self-contained breathing apparatus shall be carried in the ship in addition to normal fire-fighter's outfit.
- 2. Gas concentrations *shall* be measured, during the voyage, at least once during every eight hours at each outlet ventilator and in any other accessible space adjacent to the cargo space carrying this cargo and the results shall be recorded in the log-book. Facilities shall be provided to make accurate determinations of the gas concentrations at each outlet ventilator without danger to the operator.
- 3. Ventilation fans shall be in operation at all times from commencement of loading until the cargo space is free of ferrosilicon.
- 4. The bilge wells shall be in a clean, dry condition before loading. The bilge timbers shall be in good condition and covered with double burlap.
- 5. The bilge wells shall be opened up and the cargo space washed out after discharging. A gas check shall be made before commencement of washing out.

### **DETAILED REQUIREMENTS**

Prior to loading, the bulkheads to the engine room *shall* be inspected and approved by the competent authority as gastight. Satisfaction with the safety of the bilge pumping arrangements shall be approved by the competent authority. Inadvertent pumping through machinery spaces *shall* be avoided.

- Where the bilge suction valve of the cargo space is located in the machinery space the valve shall be checked and the valve lid and seat lapped to a fine finish, as necessary. After re-assembly the valve shall be locked shut and a notice shall be placed adjacent to the valve warning against opening without the master's permission.
- (ii) All pipes passing through the cargo space *shall* be in good order and condition. Hold atmosphere sampling units *shall* be effectively blanked off.
- (iii) Electrical circuits for equipment in cargo spaces which is unsuitable for use in an explosive atmosphere shall be isolated by removal of links in the system other than fuses.
- (iv) The cargo spaces *shall* be ventilated by at least two separate fans which *shall* be explosion-proof and arranged so that the escaping gas flow is separated from electrical cables and components. The total ventilation *shall* be at least 6 air changes per hour, based on an empty cargo space.
- (v) Ventilator trunkings shall be in sound condition and so arranged to preclude interconnection of the atmosphere in the cargo space with other cargo spaces, accommodation or work areas.

#### **OPERATIONAL REQUIREMENTS**

- (i) Smoking and naked flame shall be prohibited on deck in the vicinity of the cargo space or in the cargo space itself during loading or discharging.
- (ii) Any portable lighting shall be safe for use in an explosive atmosphere.
- (iii) The cargo shall be kept dry and during wet weather conditions cargo handling shall be suspended and the cargo space shall be closed.
- (iv) Sets of self-contained breathing apparatus shall be located and stored for immediate use together with lifeline and a gas detector.
- (v) Prior to commencement of discharging, the atmosphere in the cargo space shall be tested for the presence of toxic and flammable gases.

- (vi) Checks for contaminant gases shall be carried out at 30-minute intervals while persons are in the cargo space.
- (vii) Entry into the cargo space shall be prohibited when gas concentrations exceed the Threshold Limit Values, for phosphine (0.3 ppm) for arsine (0.05 ppm) or where the oxygen level is below 18%.

# GASES RELEASES FROM FERROSILICON IMPURITIES WHEN WATER IS ADDED

### (i) Arsine

Arsine is a toxic, colourless gas with a garlic-like odour.

#### (ii) Phosphine

Phosphine is colourless, flammable and highly toxic and has the odour of rotting fish.

### Toxicity

Phosphine acts on the central nervous system and the blood.

#### **Symptoms**

The symptoms exhibited by phosphine poisoning are an oppressed feeling in the chest, headache, vertigo, general debility, loss of appetite and great thirst. Concentrations of 2000 ppm for a few minutes and 400 to 600 ppm are dangerous to life. 0.3 ppm is the maximum concentration tolerable for several hours without symptoms.

No long-term exposures to this gas *shall* be permitted.

# FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS UN 2793

in a form liable to self-heating

#### DESCRIPTION

Metal drillings usually wet or contaminated with such materials as unsaturated cutting oil, oily rags and other combustible material.

This schedule should **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.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	Various	Various
SIZE	CLASS	GROUP
Not applicable	4.2	В

### HAZARD

These materials are liable to self-heat and ignite spontaneously, particularly when in a finely divided form, wet or contaminated with such materials, as unsaturated cutting oil, oily rags and other combustible matter.

Excessive amounts of cast iron borings or organic materials may encourage heating. Self-heating or inadequate ventilation may cause dangerous depletion of oxygen in cargo spaces.

# **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

#### 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

During loading the material shall be compacted in the cargo space as frequently as practicable with a bulldozer or other means. The bilge of each cargo space in which the cargo is loaded shall be kept as dry as practicable. After loading the cargo shall be trimmed to eliminate peaks and compacted. Wooden wet battens and dunnage shall be removed from the cargo space before the cargo is loaded.

#### PRECAUTIONS

The temperature of this cargo shall be measured prior to and during loading. The temperature of the cargo in the stockyard shall be measured at points between 200 mm and 350 mm from the surface of the cargo pile. This cargo shall only be accepted for loading when the temperature of the cargo prior to loading does not exceed 55°C. If the temperature of the cargo in any cargo

space exceeds 90°C during loading, loading shall be suspended and shall not be recommenced until the temperature of the cargo in all cargo spaces has fallen below 85°C. The ship shall not depart unless the temperature of the cargo in all cargo spaces is below 65°C and has shown a steady or downward trend in temperature for at least eight hours.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

### CARRIAGE

The surface temperature of the cargo shall be monitored and recorded daily during the voyage. Temperature readings shall be taken in such a way as not to require entry into the cargo space or, alternatively if entry is required for this purpose, at least two sets of self-contained breathing apparatus, additional to those required by SOLAS regulation II-2/10.10 should be provided.

#### DISCHARGE

Entry into the cargo spaces containing this cargo shall only be permitted for trained personnel wearing self-contained breathing apparatus when the main hatches are open and after adequate ventilation is conducted or for personnel using appropriate breathing apparatus.

### **CLEAN-UP**

Prior to washing out the residues of this cargo, any oil spillages shall be cleaned from the tank tops and the bilge wells of the cargo spaces for this cargo.

# **EMERGENCY PROCEDURES**

# **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Self-contained breathing apparatus

# **EMERGENCY PROCEDURES**

Nil

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Whilst at sea, any rise in surface temperature of the material indicates a self-heating reaction problem. If the temperature should rise to 80°C a potential fire situation is developing and the ship should make for the nearest suitable port. Batten down. Water should not be used at sea. Early application of an inert gas to a smouldering situation may be effective.

# **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

#### REMARK

In port, copious quantities of water may be used, but due consideration should be given to factors affecting the stability of the ship.

# FERTILIZERS WITHOUT NITRATES (non-hazardous)

#### DESCRIPTION

Powder and granular. Greenish, brown or beige in colour. Odourless. Very low moisture content (0% to 1%). Hygroscopic.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	714 to 1111	0.90 to 1.40
SIZE	CLASS	GROUP
1 mm to 3 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet.

### **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

# LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

No special requirements.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

#### CARRIAGE

No special requirements.

#### DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

# **CLEAN-UP** No special requirements.

ivo special requirements

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#### FISH (IN BULK)

#### **DESCRIPTION**

Fish carried in bulk after freezing.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Various	Not applicable	А

#### HAZARD

Fish carried in bulk may liquefy. This cargo is non-combustible or has a low fire-risk.

### **STOWAGE & 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

Prior to the carriage of this cargo, due consideration shall be paid to consult with the competent authority. The requirement in chapter 7 of this Code, requiring a determination of TML and moisture content declaration may be dispensed with for this cargo.

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

#### VENTILATION

No special requirements.

#### CARRIAGE

No special requirements.

#### DISCHARGE

No special requirements.

#### **CLEAN-UP**

After completion of discharge, attention shall be paid to residues of this cargo, which are liable to decompose resulting in emission of toxic gases and depletion of oxygen.

# FISHMEAL (FISHSCRAP), STABILIZED UN 2216

Anti-oxidant treated

The provisions of this entry should **not** apply to consignments of fishmeal, Group C, which are accompanied by a certificate issued by the competent authority of the country of shipment, stating that the material has no self-heating properties when transported in bulk.

#### DESCRIPTION

Brown to greenish-brown material obtained through heating and drying of oily fish. Moisture content: greater than 5% but not exceeding 12%, by mass. Strong odour may affect other cargo. Fat content; not more than 15%, by mass.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	300 to 700	1.5 to 3.0
SIZE	CLASS	GROUP
Not applicable	9	В

#### HAZARD

Liable to heat spontaneously unless has low fat content or effectively anti-oxidant treated. Liable to cause oxygen depletion in cargo space.

#### **STOWAGE & SEGREGATION**

Segregation as required for class 4.2 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 and 5 of the Code.

The cargo shall not be accepted for loading when the temperature of the cargo exceeds  $35^{\circ}$ C or  $5^{\circ}$ C above the ambient temperature, which ever is higher. The cargo may be loaded without weathering/curing prior to loading.

# PRECAUTIONS

1 This cargo shall only be accepted for loading when the stabilization of the cargo is achieved to prevent spontaneous combustion by effective application:

- .1 of between 400 and 1000 mg/kg (ppm) ethoxyquin, or
- .2 of between 1000 and 4000 mg/kg (ppm) butylated hydroxytolune

at the time of production, within 12 months prior to shipment and anti-oxidant remnant concentration shall be not less than 100 mg/kg (ppm) at the time of shipment.

2 The shipper shall provide the master with a certificate issued by a person recognized by the competent authority of the country of shipment specifying:

- moisture content;
- fat content;
- details of anti-oxidant treatment for meals older than six months;
- anti-oxidant concentrations at the time of shipment, which must exceed 100 mg/kg (ppm);
- total weight of the consignment;
- temperature of fishmeal at the time of dispatch from the factory; and
- date of production.

A suitable equipment for quantitative measurement of the concentration of oxygen in the cargo space shall be provided on board the ship.

#### VENTILATION

Surface ventilation either natural or mechanical shall be conducted during the voyage, as necessary, for the cargo spaces carrying this cargo. If the temperature of the cargo exceeds 55°C and continues to increase, ventilation to the cargo space shall be stopped. If self-heating continues, then carbon dioxide or inert gas shall be introduced to the cargo spaces.

#### CARRIAGE

This cargo shall be kept as cool and dry as reasonably practicable. The temperature of this cargo shall be measured at eight-hour intervals during the voyage. The results of measurements shall be recorded and kept on board.

#### DISCHARGE

No special requirements.

#### **CLEAN-UP**

### **EMERGENCY PROCEDURES**

# **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Self-contained breathing apparatus.

# **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down; use ship's fixed fire-fighting installation, if fitted.

#### MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

# FLUORSPAR

#### DESCRIPTION

Yellow, green or purple crystals. Coarse dust.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	Dry: 1429 to 1786 Wet: 1786 to 2128	Dry: 0.56 to 0.70 Wet: 0.47 to 0.56
SIZE	CLASS	GROUP
Not applicable	MHB	A and B

#### HAZARD

This material may liquefy if shipped at moisture content in excess of their Transportable moisture limit. See section 7 of the Code. Harmful and irritating by dust inhalation.

#### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs and all class 8 materials (goods in packaged form and solid bulk materials).

#### HOLD CLEANLINESS

No special requirements.

#### WEATHER PRECAUTIONS

When a cargo is carried in a ship other than 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 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 provided that the actual moisture content of the cargo is sufficiently less than its TML so that the actual moisture content is not liable to be increased beyond the TML by the precipitation; 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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. Protect machinery, accommodation and bilge wells from dust.

#### 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
Nil
EMERGENCY PROCEDURES
Nil
EMERGENCY ACTION IN THE EVENT OF FIRE
Nil
MEDICAL FIRST AID
Refer to the Medical First Aid Guide (MFAG), as amended.

# FLY ASH

#### **DESCRIPTION**

Fly Ash is the light, finely divided dusty fine powder residue from coal and oil fired power stations. Do not confuse with Calcined Pyrites.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	794	1.26
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

#### HAZARD

May shift when aerated. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

#### 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 and 5 of the Code. The ship carrying this cargo shall not depart until the cargo has settled.

#### PRECAUTIONS

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary

#### VENTILATION

#### CARRIAGE

After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed. All vents and access ways to the cargo spaces shall be shut during the voyage. Bilges in the cargo spaces carrying this cargo shall not be pumped unless absolutely necessary.

#### DISCHARGE

No special requirements.

### **CLEAN-UP**

In the case that the residues of this cargo are to be washed out, the cargo spaces and the other structures and equipment which may have been in contact with this cargo or its dust shall be thoroughly swept prior to washing out. Particular attention shall be paid to bilge wells and framework in the cargo spaces. After complying with the foregoing requirements, the cargo spaces shall be washed out and the water for washing out shall be pumped out in an appropriate manner, except in the case that the BCSN of the cargo to be loaded subsequent to discharge is FLY ASH.

# **GRANULATED SLAG**

#### DESCRIPTION

Residue from steelworks blast furnaces with a dirty grey, lumpy appearance. Iron: 0.5%.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1111	0.90
SIZE	CLASS	GROUP
Up to 5 mm	Not applicable	С

#### HAZARD

No special hazards. Slag dust is fine and has abrasive characteristics. This cargo is non-combustible or has a low fire-risk.

### **STOWAGE & 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.

This cargo shall not be accepted for loading when the temperature of the cargo exceeds 50°C.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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.

# **GRANULATE TYRE RUBBER**

#### DESCRIPTION

Fragmented rubber tyre material cleaned and free from other materials

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	555	1.8
SIZE	CLASS	GROUP
Granular, up to 10 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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

During handling and carriage no hotwork, burning and smoking shall be permitted in the vicinity of the cargo spaces containing this cargo. Prior to shipment, a certificate shall be given to the master by the shipper stating that this cargo this cargo consists of clean rubber material only. When the planned interval between the commencement of loading and the completion of discharge of this cargo exceeds 5 days, the cargo shall not be accepted for loading unless the cargo is to be carried in cargo spaces fitted with a fixed gas fire extinguishing system. The administration may, if it considers that the planned voyage does not exceed 5 days from the commencement of loading to the completion of discharge, exempt from the requirements of a fitted fixed gas fire-extinguishing system in the cargo spaces for the carriage of this cargo.

#### VENTILATION

No special requirements.

CARRIAGE No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

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#### GYPSUM

#### **DESCRIPTION**

A natural Hydrated Calcium Sulphate. Insoluble in water. It is loaded as a fine powder that aggregates into lumps. Gypsum is not water soluble. Average moisture content is 1% to 2%.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1282 to 1493	0.67 to 0.78
SIZE	CLASS	GROUP
Up to 100 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

#### 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**

Prior to washing out the residues of this cargo, the decks and the cargo spaces shall be shovelled and swept clean, because washing out of this cargo is difficult.

# ILMENITE CLAY

### DESCRIPTION

Very heavy black clay. Abrasive. May be dusty. Titanium, silicate and iron oxides are obtained from ilmenite clay. Moisture content: 10% to 20%.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2000 to 2500	0.4 to 0.5
SIZE	CLASS	GROUP
Up to 0.15 mm	Not applicable	А

### HAZARD

The material may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML).

This cargo is non-combustible or has a low fire-risk.

# **STOWAGE & SEGREGATION**

No special requirements.

# HOLD CLEANLINESS

No special requirements.

#### WEATHER PRECAUTIONS

When a cargo is carried in a ship other than 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 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 provided that the actual moisture content of the cargo is sufficiently less than its TML so that the actual moisture content is not liable to be increased beyond the TML by the precipitation; 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop 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**

#### **ILMENITE SAND**

This cargo can be categorized as Group A or C.

#### DESCRIPTION

Very heavy black sand. Abrasive. May be dusty. Titanium, monazite and zinc ore are obtained from ilmenite sand. The moisture content of this cargo in Group C is 1% to 2%. When moisture content is above 2%, this cargo is to be categorized in Group A

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2380 to 3225	0.31 to 0.42
SIZE	CLASS	GROUP
Up to 0.15 mm	Not applicable	A or C

### HAZARD

This cargo in Group C has no special hazards. This cargo in Group A may liquefy if shipped at a moisture content in excess of its TML. See section 7 of this Code. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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 during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

#### 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop 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

# 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**

#### **IRON ORE**

#### DESCRIPTION

Iron ore varies in colour from dark grey to rusty redvaries in iron content from haematite, (high grade ore) to ironstone of the lower commercial ranges. Moisture content: 0% to 16%. Mineral Concentrates are different cargoes (see IRON CONCENTRATE).

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1250 to 3448	0.29 to 0.80
SIZE	CLASS	GROUP
Up to 250 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk. Iron ore cargoes may affect magnetic compasses.

#### **STOWAGE & SEGREGATION**

No special requirements.

#### HOLD CLEANLINESS

No special requirements.

#### WEATHER PRECAUTIONS

No special requirement.

#### 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

Loading rates of this cargo are normally very high. Due consideration shall be paid on the ballasting operation to develop the loading plan required by regulation VI/9.3 in SOLAS Convention.

### VENTILATION

# CARRIAGE

No special requirements.

# DISCHARGE

No special requirements.

# **CLEAN-UP**

### **IRON ORE PELLETS**

#### **DESCRIPTION**

Pellets are approximately spherical lumps formed by crushing iron ore into a powder. This iron oxide is formed into pellets by using clay as a binder and then hardening by firing in kilns at 1315°C. Moisture content: 0% to 2%.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1900 to 2400	0.45 to 0.52
SIZE	CLASS	GROUP
Up to 20 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

No special requirements. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

#### VENTILATION

No special requirements.

# CARRIAGE

No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

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#### IRON OXIDE, SPENT or IRON SPONGE, SPENT UN 1376 obtained from coal gas purification

#### DESCRIPTION

Powdery material, black, brown, red or yellow. Strong odour may taint other cargo.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2222	0.45
SIZE	CLASS	GROUP
Up to 20 mm	4.2	В

#### HAZARD

Liable to heat and ignite spontaneously, especially if contaminated with oil or moisture. Toxic gases: hydrogen sulphide, sulphur dioxide, and hydrogen cyanide may be produced. Dust may cause an explosion hazard. Liable to reduce the oxygen in the cargo space.

#### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

#### 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 and 5 of the Code.

As the density of the cargo is extremely high, the tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

Prior to loading, the shipper or the manufacturer shall provide the master with a certificate stating that the cargo has been cooled and then weathered for not less than 8 weeks prior to shipment.

#### VENTILATION

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo.

# CARRIAGE

For quantitative measurements of oxygen and hydrogen cyanide, suitable detectors for each gas or combination of gases shall be on board while this cargo is carried. The detectors shall be suitable for use in an atmosphere without oxygen and 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.

### DISCHARGE

No special requirements.

### **CLEAN-UP**

No special requirements.

### **EMERGENCY PROCEDURES**

# SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus. Spray nozzles.

# **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

#### **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down; use ship's fixed fire-fighting installation if available. Exclusion of air may be sufficient to control fire.

# **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

#### IRONSTONE

#### DESCRIPTION

Ore. Moisture: 1% to 2%

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2564	0.39
SIZE	CLASS	GROUP
75 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & SEGREGATION**

No special requirements.

HOLD CLEANLINESS

No special requirements.

#### WEATHER PRECAUTIONS

No special requirements.

#### LOADING

The cargo shall be trimmed in accordance with the cargo information required by section 4 of this Code. If doubt exists, trim reasonably level to the boundaries of the cargo space so as to minimize the risk of shifting and to ensure that adequate stability will be maintained during the voyage.

As the density of the cargo is extremely high, the tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

#### VENTILATION

**CARRIAGE** No special requirements.

# DISCHARGE

No special requirements.

CLEAN-UP
## LABRADORITE

## **DESCRIPTION**

A lime-soda rock form of felspar. May give off dust.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1667	0.60
SIZE	CLASS	GROUP
Lumps: 50 mm to 300 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

No special requirements.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

#### WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

## PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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.

## **LEAD NITRATE UN 1469**

#### DESCRIPTION

White crystals. Soluble in water. Derived from the action of nitrate acid on lead.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENS	SITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-	-
SIZE	CLASS	SUBSIDIARY RISK	GROUP
Not applicable	5.1	6.1	В

## HAZARD

Toxic if swallowed or dust inhaled.

Not combustible by itself, but mixtures with combustible materials, are easily ignited and burn fiercely.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

## HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## 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. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

Natural surface ventilation shall be conducted during the voyage, as necessary, for the cargo spaces carrying this cargo.

## CARRIAGE

No special requirements.

## DISCHARGE

No special requirements.

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# **CLEAN-UP**

No special requirements.

# **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing (gloves, coveralls, headgear). Self-contained breathing apparatus. Spray nozzles.

## EMERGENCY PROCEDURES

Wear protective clothing and self-contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Use copious quantities of water, which is best applied in the form of a spray to avoid disturbing the surface of the material. The material may fuse or melt, in which condition application of water may result in extensive scattering of the molten materials. Exclusion of air or the use of CO<sub>2</sub> will not control the fire. Due consideration should be given to the effect on the stability of the ship due to accumulated water.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## **LEAD ORE**

#### **DESCRIPTION**

Heavy soft grey solid material.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1493 to 4167	0.24 to 0.67
SIZE	CLASS	GROUP
Powder	Not applicable	С

#### HAZARD

Toxic, with acids evolves highly toxic vapour. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" all class 8 liquids.

## HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

PRECAUTIONS

No special requirements.

**VENTILATION** No special requirements.

rto special requirements

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

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## LIME (UNSLAKED)

#### **DESCRIPTION**

White or greyish-white in colour.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Lump	MHB	В

## HAZARD

Unslaked lime combines with water to form calcium hydroxide (hydrated lime) or magnesium hydroxide. This reaction develops a great deal of heat which may be sufficient to cause ignition of nearby combustible materials. This is not combustible or has a low fire-risk corrosive to eyes and mucous membranes.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" all packaged dangerous goods and solid bulk cargoes in Group B.

## 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 and 5 of the Code.

#### PRECAUTIONS

This cargo shall be kept as dry as practicable. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

DISCHARGE

Do not discharge during precipitation.

## **CLEAN-UP**

No special requirements.

## **EMERGENCY PROCEDURES**

# SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Nil

# **EMERGENCY PROCEDURES**

Nil

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Nil (non-combustible). Do not use water, if involved in a fire.

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

## LIMESTONE

## DESCRIPTION

Limestone varies in colour from cream through white to medium dark grey (when freshly broken). Moisture: up to 4%.

CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1190 to 1493	0.67 to 0.84
SIZE	CLASS	GROUP
Fines to 90 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

**VENTILATION** No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

## LINTED COTTON SEED

with not more than 9% moisture and not more than 20.5% oil

## DESCRIPTION

Cottonseed with short cotton fibres adhering to the kernel after approximately 90% - 98% of the cotton has been removed by machine.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	490	2.02
SIZE	CLASS	GROUP
-	MHB	В

#### HAZARD

May self-heat and deplete oxygen in cargo space.

## **STOWAGE & SEGREGATION**

No special requirements.

#### 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 and 5 of the Code.

#### PRECAUTIONS

Entry into the cargo space for this cargo shall not be permitted until the cargo space has been ventilated and the atmosphere tested for concentration of oxygen.

## VENTILATION

No special requirements.

## CARRIAGE

Hatches should be weathertight to prevent the ingress of water.

#### DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhanging faces, as necessary.

**CLEAN-UP** No special requirements.

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## **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Self-contained breathing apparatus.

## **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down; use ship's fixed fire-fighting installation, if fitted.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## **MAGNESIA (DEADBURNED)**

#### DESCRIPTION

Manufactured in briquette form and is usually white, brown or grey. It is very similar in size, appearance and handling to gravel and is dry and dusty. Deadburned magnesia is natural magnesite calcined at very high temperatures, which results in a non-reactive magnesium oxide, which does not hydrate or produce spontaneous heat.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2000	0.5
SIZE	CLASS	GROUP

## HAZARD

No special hazards.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Prior to loading, the shipper or the manufacturer shall provide the master with a declaration stating that the cargo has been sufficiently heat-treated and is ready for loading.

**VENTILATION** No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

## MAGNESIA (UNSLAKED)

#### DESCRIPTION

## **CHARACTERISTICS**

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1250	0.80
CLED.	CL A GG	CDOUD
SIZE	CLASS	GROUP

## HAZARD

Combines with water to form magnesium hydroxide with an expansion in volume and a release of heat. May ignite materials with low ignition temperatures. Similar to LIME (UNSLAKED) but is less reactive. Corrosive to eves and mucous membranes. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" all packaged dangerous goods and solid bulk cargoes in Group B.

## 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 and 5 of the Code.

#### **PRECAUTIONS**

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

No special requirements.

## **DISCHARGE**

Do not discharge during precipitation.

## **CLEAN-UP**

No special requirements.

## **EMERGENCY PROCEDURES**

# **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Nil

# **EMERGENCY PROCEDURES**

Nil

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Nil (non-combustible). Do not use water if cargo is involved in a fire.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## MAGNESITE, natural

#### **DESCRIPTION**

Magnesite is white to yellow in colour.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1429	0.7
SIZE	CLASS	GROUP
3 mm to 30 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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.

## **MAGNESIUM NITRATE UN 1474**

#### **DESCRIPTION**

White crystals, soluble in water. Hygroscopic.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Not applicable	5.1	В

#### HAZARD

Although non-combustible by itself, mixtures with combustible material are easily ignited and may burn fiercely.

This cargo is hygroscopic and will cake if wet.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

#### 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

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

## **CLEAN-UP**

## **EMERGENCY PROCEDURES**

## **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus. Spray nozzles.

## EMERGENCY PROCEDURES

Wear protective clothing and self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Use copious quantities of water, which is best applied in the form of a spray to avoid disturbing the surface of the material. The material may fuse or melt, in which condition application of water may result in extensive scattering of the molten materials. Exclusion of air or the use of  $CO_2$  will not control the fire. Due consideration should be given to the effect on the stability of the ship due to the accumulated water.

# **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

## REMARKS

Material is non-combustible unless contaminated.

## MANGANESE ORE

#### **DESCRIPTION**

Manganese ore is black to brownish black in colour. It is a very heavy cargo. Moisture content: up to 15%.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1429 to 3125	fines to 0.32
11		lumps to 0.70
SIZE	CLASS	GROUP
Fine dust to 250 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

## PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

## VENTILATION

# CARRIAGE

No special requirements.

# DISCHARGE

No special requirements.

# **CLEAN-UP**

## **MARBLE CHIPS**

## DESCRIPTION

Dry, dusty, white to grey lumps, particles and powder mixed with a small amount of gravel and pebbles.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	654	1.53
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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

#### **METAL SULPHIDE CONCENTRATES** (See also Mineral Concentrates schedule)

## DESCRIPTION

Mineral concentrates are refined ores in which the valuable components have been enriched by eliminating the bulk of waste materials. Generally the particle size is small although agglomerates sometimes exist in concentrates which have not been freshly produced. The most common concentrates in this category are: zinc concentrates, lead concentrates,

The most common concentrates in this category are: zinc concentrates, lead concentrates, copper concentrates and low grade middling concentrates.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1790 to 3230	0.31 to 0.56
SIZE	CLASS	GROUP
Various	MHB	A and B

# HAZARD

Some sulphide concentrates are liable to oxidation and may have a tendency to self-heat, with associated oxygen depletion and emission of toxic fumes. Some materials may present corrosion problems.

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 should be subject to the Administration's authorization as provided by SOLAS regulation II-2/10.7.1.4.

## **STOWAGE & SEGREGATION**

Unless determined by the competent authority, segregation as required for class 4.2 materials. "Separated from" foodstuffs and all class 8 acids.

## 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 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 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 provided that the actual moisture content of the cargo is sufficiently less than its TML so that the actual moisture content is not liable to be increased beyond the TML by the precipitation; 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

This cargo shall be trimmed to ensure that the height difference between peaks and troughs does not exceed 5% of the ship's breadth and that the cargo slopes uniformly from the hatch boundaries to the bulkheads and no shearing faces remain to collapse during voyage, in particular on smaller ships, i.e., 100 m long or less.

As the density of the cargo is extremely high, the tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that the tanktop is not overstressed during the voyage and during loading by a pile of the cargo.

## PRECAUTIONS

Entry into the cargo space for this cargo shall not be permitted until the cargo space has been ventilated and the atmosphere tested for concentration of oxygen. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

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. For quantitative measurements of oxygen and toxic fumes liable to be evolved by the cargo, suitable detectors for each gas and fume or combination of these shall be on board while this cargo is carried. The detectors shall be suitable for use in an atmosphere without oxygen. 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.

## DISCHARGE

No special requirements.

# CLEAN-UP

## **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Self-contained breathing apparatus.

## **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down; use ship's fixed fire-fighting installation. Exclusion of air may be sufficient to control the fire. **Do not use water.** 

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

#### REMARKS

Fire may be indicated by the smell of sulphur dioxide.

#### **Mineral Concentrates**

(See Bulk Cargo Shipping Names below)

CEMENT COPPER COPPER CONCENTRATE IRON CONCENTRATE IRON CONCENTRATE (pellet feed, sinter feed) IRON CONCENTRATE (sinter feed) LEAD AND ZINC CALCINES (mixed) LEAD AND ZINC MIDDLINGS LEAD CONCENTRATE LEAD ORE RESIDUE LEAD SILVER CONCENTRATE MANGANESE CONCENTRATE NEFELENE SYENITE (mineral) NICKEL CONCENTRATE PENTAHYDRATE CRUDE PYRITES PYRITIC ASHES (iron) PYRITIC CINDERS SILVER LEAD CONCENTRATE SLIG (iron ore) ZINC AND LEAD CALCINES (mixed) ZINC AND LEAD MIDDLINGS ZINC CONCENTRATE ZINC SINTER ZINC SLUDGE

All known Bulk Cargo Shipping Names (BCSN) of mineral concentrates are listed above but the list is not exhaustive. See also the entries for Metal Sulphide Concentrates.

#### DESCRIPTION

Mineral concentrates are refined ores in which valuable components have been enriched by eliminating the bulk of waste materials.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1754 to 3030	0.33 to 0.57
SIZE	CLASS	GROUP
Various	Not applicable	А

#### HAZARD

The above materials may liquefy if shipped at moisture content in excess of their Transportable moisture limit (TML). See section 7 of the Code. These cargoes are non-combustible or have low fire-risks.

This cargo will decompose burlap or canvas cloth covering bilge wells. Continuous carriage of this cargo may have detrimental structural effects over a long period of time.

## **STOWAGE & SEGREGATION**

No special requirements.

#### HOLD CLEANLINESS

## WEATHER PRECAUTIONS

When a cargo is carried in a ship other than 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 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 provided that the actual moisture content of the cargo is sufficiently less than its TML so that the actual moisture content is not liable to be increased beyond the TML by the precipitation; 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

This cargo shall be trimmed to ensure that the height difference between peaks and troughs does not exceed 5% of the ship's breadth and that the cargo slopes uniformly from the hatch boundaries to the bulkheads and no shearing faces remain to collapse during voyage, in particular on smaller ships, i.e., 100 m long or less.

As the density of the cargo is extremely high, the tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that the tanktop 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. Bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure 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**

## **MONOAMMONIUM PHOSPHATE (M.A.P.)**

#### DESCRIPTION

MAP is odourless and comes in the form of brownish-grey granules. It can be very dusty. Hygroscopic.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
35° to 40°	826 to 1000	1.0 to 1.21
SIZE	CLASS	GROUP

## HAZARD

Bulk MAP has a pH of 4.5 and in the presence of moisture content can be highly corrosive.

This cargo is non-combustible or has a low fire-risk.

This cargo is hygroscopic and will cake if wet.

This cargo will decompose burlap or canvas cloth covering bilge wells. Continuous carriage of this cargo may have detrimental structural effects over a long period of time.

## **STOWAGE & SEGREGATION**

No special requirements.

## 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 and 5 of the Code.

## PRECAUTIONS

Protect machinery, accommodation and equipment from dust.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

Condensation in the cargo spaces carrying this cargo, sweating of this cargo and entering of water from hatch covers to the cargo spaces shall be checked regularly during the voyage. Due attention shall be paid to the sealing of hatches of the cargo spaces.

## DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

## **CLEAN-UP**

After discharge of this cargo, particular attention shall be paid to bilge wells of the cargo spaces.

## PEANUTS (in shell)

#### DESCRIPTION

An edible, tan coloured nut. Variable moisture content. Extremely dusty.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	304	3.29
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

#### HAZARD

May heat spontaneously. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Away from" sources of heat.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

No special requirements.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

## PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

No special requirements.

#### DISCHARGE

No special requirements.

## **CLEAN-UP**

## PEAT MOSS

## DESCRIPTION

Surface mined from mires, bogs, fens, muskeg and swamps. Types include moss peat, sedge peat and grass peat. Physical properties depend on organic matter, water and air content, botanical decomposition and degree of decomposition.

May range from a highly fibrous cohesive mass of plant remains which when squeezed in its natural state exudes clear to slightly coloured water, to a well decomposed, largely amorphous material with little or no separation of liquid from solids when squeezed.

Typically air-dried peat has low density, high compressibility and high water content; in its natural state it can hold 90 percent or more of water by weight of water when saturated.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	80 to 500	2 to 12.5
SIZE	CLASS	GROUP
Fine Powder	MHB	A and B

#### HAZARD

Oxygen depletion and an increase in carbon dioxide in cargo and adjacent spaces.

Risk of dust explosion when loading. Caution should be exercised when walking or landing heavy machinery on the surface of uncompressed Peat Moss.

Peat Moss having a moisture content of more than 80% by weight should only be carried on specially fitted or constructed ships (see paragraphs 7.2.2 to 7.2.4 of this Code).

Dust may cause eye, nose and respiratory irritation.

## **STOWAGE & SEGREGATION**

No special requirements.

## HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

Prior to loading, this cargo shall be stockpiled under cover to effect drainage for reduction of moisture content. 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 and 5 of the Code.

## PRECAUTIONS

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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. All personnel of the ship carrying this cargo and all personnel involved in handling of this cargo shall be cautioned that washing hands before eating or smoking and prompt treatment of cuts and scrapes are necessary in case of contact with this cargo or its dust. Entry of personnel into cargo spaces shall not be permitted until tests have been carried out and it has been established that the oxygen content has been restored to a normal level.

## VENTILATION

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo.

## CARRIAGE

No special requirements.

## DISCHARGE

No special requirements.

## CLEAN-UP

No special requirements.

# **EMERGENCY PROCEDURES**

# SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Nil

## **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.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## **PEBBLES (sea)**

## DESCRIPTION

Round pebbles. Rolls very easily.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1695	0.59
SIZE	CLASS	GROUP
30 mm to 110 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

This cargo shall be loaded carefully to prevent damage to the tanktop.

#### **VENTILATION** No special requirements.

no special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

## **PELLETS (concentrates)**

#### DESCRIPTION

Concentrate ore which has been pelletized. Moisture up to 6%.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2128	0.47
SIZE		CDOUD
SIZE	CLASS	GROUP

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

No special requirements.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## 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.

## PERLITE ROCK

#### DESCRIPTION

Clay-like and dusty. Light grey. Odourless. Moisture: 0.5% to 1%

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	943 to 1020	0.98 to 1.06
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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**

## **PETROLEUM COKE (calcined or uncalcined)**

## **DESCRIPTION**

Black, finely divided residue from petroleum refining in the form of powder and small pieces. The provisions of this schedule should not apply to materials having a temperature below  $55^{\circ}$ C when loaded.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	599 to 800	1.25 to 1.67
SIZE	CLASS	GROUP
Powder to small pieces	MHB	В

## HAZARD

Uncalcined petroleum coke is liable to heat and ignite spontaneously when not loaded and transported under the provisions of this entry.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

"Separated longitudinally by an intervening complete compartment or hold from" all goods of class 1, Divisions 1.1 and 1.5.

"Separated by a complete compartment or hold from" all other hazardous materials and dangerous goods (goods in packaged form and solid bulk materials).

## HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

No special requirements.

## LOADING

- 1 When the cargo is loaded in a cargo space over a tank containing fuel or other material having a flashpoint under 93°C, the cargo having temperature of 55°C or higher shall not be loaded in the cargo space, unless part of the cargo having temperature 44°C or lower is loaded in a layer of at least 0.6 m thickness throughout the cargo space prior to loading the cargo having temperature of 55°C or higher.
- 2 When the cargo having temperature of 55°C or higher is loaded in accordance with the above requirement and the thickness of the layer of the cargo to be loaded is bigger than 1.0 m, the cargo shall first be loaded within a layer, the thickness of which is between 0.6 m and 1.0 m.
- 3 After the completion of loading operation specified in the above paragraphs, the loading operation may proceed.

The cargo shall be trimmed in accordance with the cargo information required by section 4 of this Code.

## PRECAUTIONS

This cargo shall not be loaded when the temperature of this cargo exceeds 107°C. The master shall post warnings about the high temperature of this cargo near the cargo spaces

## 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, coveralls, headgear). Self-contained breathing apparatus. Spray nozzles.

# **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down; use of ship's fixed fire-fighting installation if available. Exclusion of air may be sufficient to control fire.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

## **PHOSPHATE (defluorinated)**

#### **DESCRIPTION**

Granular, similar to fine sand. Shipped dry. Dark grey. No moisture content.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	893	1.12
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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**

## **PHOSPHATE ROCK (calcined)**

## **DESCRIPTION**

Usually in the form of fine ground rock or prills. Extremely dusty. Hygroscopic.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	794 to 1563	0.64 to 1.26
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet.

## **STOWAGE & 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 during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

## VENTILATION

No special requirements.

## CARRIAGE

No special requirements.

## DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

CLEAN-UP No special requirements. I:\MSC\84\24-Add-3.doc

## **PHOSPHATE ROCK (uncalcined)**

## DESCRIPTION

Phosphate rock is an ore in which phosphorus and oxygen are chemically united. Depending on the source, it is tan to dark grey, dry and dusty. Moisture: 0% to 2%. Depending on its source this cargo may have flow characteristic, but once settled it is not liable to shift.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1250 to 1429	0.70 to 0.80
SIZE	CLASS	GROUP
Powder to lumps	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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.

I:\MSC\84\24-Add-3.doc
## **PIG IRON**

## **DESCRIPTION**

Foundry pig iron is cast in 28 grades into 20 kg pigs. In a random heap, pig iron occupies approximately 50% of the apparent volume.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	3333 to 3571	0.28 to 0.30
SIZE	CLASS	GROUP
550 mm x 90 mm x 80 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

No special requirements.

#### HOLD CLEANLINESS

No special requirements.

#### WEATHER PRECAUTIONS

No special requirements.

## LOADING

This cargo is usually loaded using tubs. In such case, tubs are usually lowered by a crane into the hold and the contents are spilled out. When this cargo is loaded using tubs, the first few tubs *shall* be lowered onto the tanktop to avoid damage.

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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

## PRECAUTIONS

No special requirements.

**VENTILATION** No special requirements.

**CARRIAGE** No special requirements.

## DISCHARGE

No special requirements.

# **CLEAN-UP**

Prior to washing out the residues of this cargo, the bilge wells of the cargo spaces shall be cleaned.

# PITCH PRILL

## DESCRIPTION

Pitch Prill is made from tar produced during the coking of coal. It is black with a distinctive odour. It is extruded into its characteristic pencil shape to make handling easier. Cargo softens between 40°C to 50°C. Melting point: 105°C to 107°C

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	500 to 800	1.25 to 2.0
SIZE	CLASS	GROUP
9 mm diameter and up to 0.7 cm long	MHB	В

## HAZARDS

Melts when heated. Combustible, burns with a dense black smoke. Dust may cause skin and eye irritation. Normally this cargo has a low fire-risk. However powder of the cargo is easy to ignite and may cause fire and explosion. Special care should be taken for preventing fire during loading or discharging.

## **STOWAGE & SEGREGATION**

Segregation as required for class 4.1 materials.

#### HOLD CLEANLINESS

No special requirements.

## WEATHER PRECAUTIONS

Refer to the appendix to this schedule.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

This cargo shall not be stowed in a cargo space adjacent to heated tanks to avoid softening and melting of the cargo.

## PRECAUTIONS

Refer to the appendix to this schedule.

## VENTILATION

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo.

## CARRIAGE

After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed. Condensation in the cargo spaces carrying this cargo shall be checked regularly during voyage.

## DISCHARGE

Adequate measures shall be taken to prevent dust generation.

## **CLEAN-UP**

No special requirements.

# **EMERGENCY PROCEDURES**

# SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing, gloves, boots, overalls, and headgear. Self-contained breathing apparatus, spray nozzles.

# **EMERGENCY PROCEDURES**

Wear protective clothing and self contained breathing apparatus.

# **EMERGENCY ACTION IN THE EVENT OF A FIRE**

Batten down: use ship's fixed fire-fighting installation if available. Exclusion of air may be sufficient to control fire.

# MEDICAL FIRST AID

Refer to Medical First Aid Guide (MFAG), as amended.

# APPENDIX

# PITCH PRILL

## **General Precautions**:

- 1. Personnel engaged in loading shall be supplied with gloves, dust masks, approved protective clothing and goggles.
- 2. Eyewashes and sun screen creams shall be readily available.
- 3. Number of personnel in area of loading shall be kept to a minimum. Personnel in area of loading shall be aware of all the hazards involved.
- 4. Personnel engaged in the handling of this cargo *shall* wash well and keep out of the sun for a few days, after the cargo handling.
- 5. The hatch shall be closed after loading or discharge has ceased and the ship shall be washed out to remove all dust.
- 6. Due consideration shall be paid on suspending the cargo handling when wind is blowing dust.
- 7. After completion of discharging this cargo, the deck shall be cleaned up to remove all spillages.
- 8. Ventilation of the accommodation spaces *shall* be closed and the air conditioning systems for the accommodation spaces *shall* be on re-cycle mode when this cargo is being handled either loading or discharging.
- 9. The cargo dust is easily ignited and may cause fire and explosion. Special care *shall* be taken to prevent fire during loading and discharging the cargo.

## POTASH

## DESCRIPTION

Brown, pink or white in colour, potash is produced in granular crystals. It is odourless and hygroscopic.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
32° to 35°	971 to 1299	0.77 to 1.03
SIZE	CLASS	GROUP
Powder to 4 mm	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet.

# **STOWAGE & 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 during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

## PRECAUTIONS

No special requirements.

## VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed to prevent water ingress, as necessary.

## DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

## **CLEAN-UP**

This cargo is mildly corrosive. After discharge of this cargo, the cargo spaces and the bilge wells shall be thoroughly swept clean and washed out to remove all traces of the cargo, except in the case that the cargo to be loaded has the same BCSN of the cargo to be loaded subsequent to discharge is POTASH.

## **POTASSIUM CHLORIDE**

## DESCRIPTION

Brown, pink or white in colour, powder. Potassium Chloride is produced in granular crystals. It is odourless and is soluble in water. Hygroscopic.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
30° to 47°	893 to 1235	0.81 to 1.12
SIZE	CLASS	GROUP
Up to 4 mm	Not applicable	С

## HAZARD

Even though this cargo is classified as non-hazardous, it may cause heavy corrosion when wet. This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet

This cargo is hygroscopic and will cake if wet.

## **STOWAGE & SEGREGATION**

No special requirements.

## 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 and 5 of the Code.

## PRECAUTIONS

No special requirements.

## VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed to prevent water ingress.

#### DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

## **CLEAN-UP**

After discharge of this cargo, the cargo spaces and the bilge wells shall be swept clean and thoroughly washed out.

## POTASSIUM NITRATE UN 1486

## **DESCRIPTION**

Transparent, colourless or white crystalline powder or crystals. Hygroscopic.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
30° to 31°	1136	0.88
SIZE	CLASS	GROUP
Crystals or powder	5.1	В

#### HAZARD

Oxidizes when wet. Mixtures with combustible materials are readily ignited and may burn fiercely.

This cargo is hygroscopic and will cake if wet.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

#### 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 and 5 of the Code.

#### PRECAUTIONS

Due regard shall be paid to prevent contact of the cargo and combustible materials.

## VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

No special requirements.

#### DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

## **CLEAN-UP**

# **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus. Spray nozzles.

# **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Use copious quantities of water, which is best, applied in the form of a spray to avoid disturbing the surface of the material. The material may fuse or melt, in which condition application of water may result in extensive scattering of the molten materials. Exclusion of air or the use of CO<sub>2</sub> will not control the fire. Due consideration should be given to the effect on the stability of the ship due to accumulated water.

# **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

## REMARKS

This material is non-combustible unless contaminated.

## **POTASSIUM SULPHATE**

#### DESCRIPTION

Hard crystals or powder. Colourless or white.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
31	1111	0.90
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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.

## PUMICE

## **DESCRIPTION**

Highly porous rock of volcanic origin. Greyish-white.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	308 to 526	1.90 to 3.25
SIZE	CLASS	GROUP
Powder to lumps	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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.

## **PYRITE (containing copper and iron)**

This cargo can be categorized as Group A or C. This cargo entry is for cargo in Group C.

#### **DESCRIPTION**

Iron disulphide, containing copper and iron. Moisture 0% to 7%. Extremely dusty.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2000 to 3030	0.33 to 0.50
SIZE	CLASS	GROUP

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

## VENTILATION

# CARRIAGE

No special requirements.

# DISCHARGE

No special requirements.

# **CLEAN-UP**

# **PYRITES, CALCINED (Calcined Pyrites)**

# DESCRIPTION

Dust to fines, Calcined Pyrites is the residual product from the chemical industry where all types of metal sulphides are either used for the production of sulphuric acid or are processed to recover the elemental metals – copper, lead, zinc, etc. The acidity of the residue can be considerable, in particular, in the presence of water or moist air, where pH values between 1.3 and 2.1 are frequently noted.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2326	0.43
SIZE	CLASS	GROUP
Not applicable	MHB	A and B

# HAZARD

Highly corrosive to steel when wet. Inhalation of dust is irritating and harmful. Cargo may liquefy.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

## HOLD CLEANLINESS

Due consideration shall be paid to cleaning and drying of the cargo spaces.

## WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop 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. Ceiling boards shall be removed or sealed to prevent penetration by this cargo. The tanktop on which this cargo is to be loaded shall be covered with lime before loading.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed to prevent water ingress, as necessary.

#### DISCHARGE

No special requirements.

#### **CLEAN-UP**

No special requirements.

# **EMERGENCY PROCEDURES**

<u>SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED</u> Nil	
EMERGENCY PROCEDURES	
Nil	
EMERGENCY ACTION IN THE EVENT OF FIRE	
Nil (non-combustible).	
MEDICAL FIRST AID	
Refer to the Medical First Aid Guide (MFAG), as amended.	

# PYROPHYLLITE

#### **DESCRIPTION**

A natural hydrous aluminum silicate. Chalk-white. May be dusty. Lumps: 75%, Rubble: 20%, Fines: 5%.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2000	0.50
SIZE	CLASS	GROUP
Lump to fine	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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**

## QUARTZ

## **DESCRIPTION**

Crystalline lumps.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1667	0.60
SIZE	CLASS	GROUP
Lumps: 50 mm to 300 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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.

# QUARTZITE

# DESCRIPTION

Quartzite is a compact, granular, metamorphosed sandstone containing quartz. It is white, red, brown or grey in colour and its size varies from large rocks to pebbles. It may also be shipped in semi-crushed and graded sizes.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1563	0.64
SIZE	CLASS	GROUP
10 mm to 200 mm	Not applicable	С

## HAZARD

No special hazards. Dust of this cargo is very abrasive. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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

Protect machinery and equipment from dust. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements. I:\MSC\84\24-Add-3.doc

# RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-1) non-fissile or fissile-excepted UN 2912

# DESCRIPTION

This schedule includes ores containing naturally occurring radionuclides (e.g., uranium, thorium) and natural or depleted uranium and thorium concentrates of such ores, including metals, mixtures and compounds.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Not applicable	7	В

## HAZARD

Low radiotoxicity. Some materials may possess chemical hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

## 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 and 5 of the Code.

## PRECAUTIONS

Personnel shall not be unnecessarily exposed to dust of this cargo. Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and facemasks. There shall be no leakage outside the cargo space in which this cargo is stowed.

## VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

All instructions provided by the shipper shall be followed for the carriage of this cargo.

## DISCHARGE

All instructions provided by the shipper shall be followed for the discharge of this cargo.

## **CLEAN-UP**

Cargo spaces used for this cargo shall not be used for other goods until decontaminated. Refer to subsection 9.3.2.3 of this Code.

## **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**

Batten down; use ship's fixed fire-fighting installation, if fitted. Use water spray to control spread of dust, if necessary.

# MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended. Radio for medical advice.

## REMARKS

Most materials are likely to be non-combustible. Speedily collect and isolate potentially contaminated equipment and cover. Seek expert advice.

# **RADIOACTIVE MATERIAL SURFACE CONTAMINATED OBJECTS (SCO-1),** non-fissile or fissile-excepted UN 2913

## DESCRIPTION

The radioactivity of SCO-1 is low. This schedule includes solid objects of non-radioactive material having a radioactive material distributed on its surfaces which:

- 1. the non-fixed contamination on the accessible surface, averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ), does not exceed 4 Bq/cm<sup>2</sup> for beta and gamma emitters and low-toxicity alpha emitter, or 0.4 Bq/cm<sup>2</sup> for all other alpha emitters;
- 2. the fixed contamination on the accessible surface, averaged over 300 cm<sup>2</sup> (or the area of the surface if less than 300 cm<sup>2</sup>), does not exceed 4 x  $10^4$  Bq/cm<sup>2</sup> for beta and gamma emitters and low-toxicity alpha emitters, or 4 x  $10^3$  Bq/cm<sup>2</sup> for all other alpha emitters; and
- 3. the non-fixed contamination plus the fixed contamination on the inaccessible surface, averaged over 300 cm<sup>2</sup> (or the area of the surface if less than 300cm<sup>2</sup>), does not exceed  $4 \times 10^4$  Bq/cm<sup>2</sup> for beta and gamma emitters and low-toxicity alpha emitters, or  $4 \times 10^3$  Bq/cm<sup>2</sup> for all other alpha emitters.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Not applicable	7	В

# HAZARD

Low radioactivity.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

## 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 and 5 of the Code.

## PRECAUTIONS

Personnel shall not be exposed to dust of this cargo. Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles and facemasks. There shall be no leakage outside the cargo space in which this cargo is stowed.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

All instructions provided by the shipper shall be followed for the carriage of this cargo.

#### DISCHARGE

All instructions provided by the shipper shall be followed for the discharge of this cargo.

#### **CLEAN-UP**

Cargo spaces used for this cargo shall not be used for other goods until decontaminated. Refer to subsection 9.3.2.3 of this Code.

## **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**

Batten down; use ship's fixed fire-fighting installation, if fitted. Use water spray to control spread of dust, if necessary.

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended. Radio for medical advice.

#### REMARKS

Most materials are likely to be non-combustible. Speedily collect and isolate potentially contaminated equipment and cover. Seek expert advice.

# **RASORITE (ANHYDROUS)**

## **DESCRIPTION**

A granular, yellow-white crystalline material with little or no dust. Abrasive. Hygroscopic.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1282 to 1493	0.67 to 0.78
SIZE	CLASS	GROUP
Less than 2.36 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet.

## **STOWAGE & 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

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

## **CLEAN-UP**

## **RUTILE SAND**

## DESCRIPTION

Fine particled brown to black sand. Abrasive. Shipped dry. May be dusty.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2500 to 2700	0.37 to 0.40
SIZE	CLASS	GROUP
0.15 mm or less	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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 during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop 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.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

# SALT

## DESCRIPTION

Fine white grains. Moisture variable to 5.5%. This cargo is highly soluble. In the case of ingress of water into the holds, there is a risk to the loss of the stability of the ship through dissolution of this cargo (formation of a wet base and shifting of cargo).

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	893 to 1235	0.81 to 1.12
SIZE	CLASS	GROUP
Grains up to 12 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

No special requirements.

## 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 and 5 of the Code.

#### PRECAUTIONS

The parts of the cargo space in contact with the cargo such as tanktops, hoppers, side plating and bulkheads shall be lime washed or coated with paint to prevent corrosion.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed.

#### DISCHARGE

No special requirements.

## **CLEAN-UP**

## SALT CAKE

#### DESCRIPTION

Impure sodium sulphate. White in colour. Granular, shipped dry.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1052 to 1124	0.89 to 0.95
SIZE	CLASS	GROUP
10 mm to 200 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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.

## SALT ROCK

#### **DESCRIPTION**

White. Moisture content 0.02%.

# CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	943 to 1020	0.98 to 1.06
SIZE	CLASS	GROUP
Small granules	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & 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.

## SAND

## **DESCRIPTION**

Usually fine particles. Abrasive and dusty. Sands included in this schedule are:

## FOUNDRY SAND POTASSIUM FELSPAR SAND QUARTZ SAND

#### SILICA SAND SODA FELSPAR SAND

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1020 to 2000	0.50 to 0.98
SIZE	CLASS	GROUP

#### HAZARD

Inhalation of silica dust can result in respiratory disease. Silica particulates are easily transported by air and inhaled.

Industrial sand may be coated with resin and will cake if exposed to heat (55°C to 60°C). This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

Industrial sand coated with resin shall be "separated from" sources of heat.

## HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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

# CARRIAGE

The bilge wells of the cargo spaces carrying this cargo shall be kept dry.

# DISCHARGE

No special requirements.

# **CLEAN-UP**

After discharge of this cargo, particular attention shall be paid to bilge wells of the cargo spaces.

#### SAWDUST

#### **DESCRIPTION**

Fine particles of wood.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Not applicable	MHB	В

#### HAZARD

Spontaneous combustion if not clean, dry and free from oil. Liable to cause oxygen depletion within the cargo space.

## **STOWAGE & SEGREGATION**

Segregation as required for class 4.1 materials. "Separated from" all class 5.1 liquids and all class 8 liquids.

#### 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 and 5 of the Code.

#### PRECAUTIONS

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Prior to loading this cargo, the shipper shall provide the master with a certificate stating that the cargo is clean, dry and free from oil.

## VENTILATION

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo.

#### CARRIAGE

No special requirements.

## DISCHARGE

## **CLEAN-UP**

No special requirements.

# **EMERGENCY PROCEDURES**

# SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Nil

# **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.

# **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

## SCRAP METAL

## DESCRIPTION

"Scrap" iron or steel covers an enormous range of ferrous metals, principally intended for recycling.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	Varies	Varies
SIZE	CLASS	GROUP
Varies	Not applicable	С

## HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk except when cargo contains swarf (fine metal turnings liable to spontaneous combustion) refer to the entry for ferrous metal borings, shavings turnings or cutting in this Code.

## **STOWAGE & 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 during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

## LOADING

Refer to the appendix to this schedule.

## PRECAUTIONS

Refer to the appendix to this schedule.

#### VENTILATION

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo.

## CARRIAGE

Bilges in the cargo spaces carrying this cargo shall not be pumped unless absolutely necessary. Bilgewater of this cargo may contain a certain amount of dirt and oil from old machinery. Refer to the appendix to this individual schedule.

## DISCHARGE

When this cargo is discharged by magnet or spider grab:

- .1 the deck and deck machineries shall be protected from falling cargo; and
- .2 damages to the ship shall be checked, after the completion of discharge.

# **CLEAN-UP**

Prior to cleaning up the cargo spaces for this cargo, the crew shall be informed of danger due to broken glass and sharp edges. Prior to washing out the residues of this cargo, any oil spillages shall be cleaned from the tank tops and the bilge wells of the cargo spaces for this cargo.

## APPENDIX

## SCRAP METAL

Handling of this cargo varies from magnets to spider grabs, depending usually on the size of material. This cargo may include articles from the size of car bodies to fine metal turnings (swarf). The weight of individual pieces will also vary greatly, ranging from heavy machinery to tin cans.

## Loading

Before loading, the cargo spaces *shall* be prepared as per general loading practice and any areas liable to be damaged by falling cargo *shall* be protected with dunnage. This includes decks and coamings in way of the material's path to the cargo spaces. Removing the ship's side rails may be advisable.

A layer of this cargo *shall* be carefully placed over the tank top in the square to cushion any fall out. Magnet and grab drivers *shall* be instructed not to release their loads too high above the pile.

The usual method of loading is to form a pile along the ship's centre line and use the slope to roll material into the ends and sides. Every effort must be made to work the wings and ends to evenly distribute the weight. If this is not done, the light high volume pieces will roll to the wings and the small heavy pieces will concentrate in the square.

When pumping the bilge wells, the master shall be aware of that a certain amount of dirt and oil can be expected from old machinery. Broken glass and sharp jagged edges may be present and care *shall* be taken by personnel working near scrap.

Before hatches are closed, the cargo spaces shall be checked that no sharp projections could pierce the ship's side.

## SEED CAKE, containing vegetable oil UN 1386

(a) mechanically expelled seeds, containing more than 10% of oil or more than 20% of oil and moisture combined.

The range of oil and moisture content is indicated in the figure.



To be carried in bulk only with special permission from the competent authority.

## DESCRIPTION

Residue remaining after oil has been expelled mechanically from oil-bearing seeds. The cereals and cereal products included in this schedule are those derived from:

Bakery materials	Mill feed pellets
Barley malt pellets	Niger seed, expellers
Beet	Oil cake
Bran pellets	Palm kernel
Brewers grain pellets	Peanuts
Citrus pulp pellets	Pellets, cereal
Coconut	<b>Pollard pellets</b>
Copra	Rape seed
Corn gluten	Rice broken
Cotton seed	<b>Rice bran</b>
Expellers	Safflower seed
Gluten pellets	Seed expellers, oily
Ground nuts, meal	Soya bean
Hominy chop	Strussa pellets
Linseed	Sunflower seed
Maize	<b>Toasted meals</b>
Meal. oilv	

The above may be shipped in the form of pulp, meals, cake, pellets and expellers.
#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	478 to 719	1.39 to 2.09
SIZE	CLASS	GROUP
Not applicable	4.2	В

### HAZARD

May self-heat slowly and, if wet or containing an excessive proportion of unoxidized oil, ignite spontaneously. Liable to oxidize, causing subsequent reduction of oxygen in the cargo space. Carbon dioxide may be produced.

### **STOWAGE & SEGREGATION**

No special requirements other than prescribed in section 9.3 of this Code.

### 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 and 5 of the Code.

## PRECAUTIONS

This cargo shall only be accepted for loading when the temperature of the cargo is not higher than ambient temperature plus 10°C or 55°C, whichever is lower. Before shipment, this cargo shall be properly aged; the duration of ageing required varies with the oil content. The competent authority may permit seed cakes described in this schedule to be carried under conditions governing SEED CAKE (b), when satisfied, as a result of tests, that such relaxation is justified (see following schedule). Certificates from the competent authority giving such permission shall state the oil content and moisture content. The temperature of this cargo shall be measured regularly at a number of depths in the cargo spaces and recorded during the voyage. If the temperature of the cargo reaches 55°C and continues to increase, ventilation to the cargo shall be stopped. If self-heating continues, then carbon dioxide or inert gas shall be introduced to the cargo space. Entry of personnel into cargo spaces for this cargo shall not be permitted until tests have been carried out and it has been established that the oxygen content has been restored to a normal level.

#### VENTILATION

The cargo spaces carrying this cargo shall not be mechanically ventilated during voyage to prevent self-heating of the cargo, except in case of emergency.

### 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.

## **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down; use ship's fixed fire-fighting installation, if fitted.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

#### SEED CAKE, containing vegetable oil UN 1386

(b) solvent extraction 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.

Note: This entry covers the following:

- .1 all solvent extracted and expelled seed cakes containing not more than 10% oil, and not more than 10% moisture; and
- .2 all solvent extracted and expelled seed cakes containing not more than 10% oil and moisture content higher than 10%, in which case, the oil and moisture combined must not exceed 20%.

F 20 F 10

0

10

Moisture [%]

The range of oil and moisture content is indicated in the figure.



#### DESCRIPTION

Residue remaining after oil has been extracted by a solvent process or expelled mechanically from oil-bearing seeds. The cereals and cereal products included in this schedule are those derived from:

Bakery materials	Mill feed pellets
Barley malt pellets	Niger seed, expellers
Beet	Oil cake
Bran pellets	Palm kernel
Brewers grain pellets	Peanuts
Citrus pulp pellets	Pellets, cereal
Coconut	<b>Pollard pellets</b>
Copra	Rape seed
Corn gluten	<b>Rice broken</b>
Cotton seed	Rice bran
Expellers	Safflower seed
Gluten pellets	Seed expellers, oily
Ground nuts, meal	Soya bean
Hominy chop	Strussa pellets
Linseed	Sunflower seed
Maize	<b>Toasted meals</b>

### Meal, oily

The above may be shipped in the form of pulp, meals, cake, pellets and expellers.

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. 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 for the exemption are met.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	478 to 719	1.39 to 2.09
SIZE	CLASS	GROUP
Not applicable	4.2	В

## HAZARD

May self-heat slowly and, if wet or containing an excessive proportion of unoxidized oil, ignite spontaneously. Liable to oxidize, causing subsequent reduction of oxygen in the cargo space. Carbon dioxide may also be produced.

## **STOWAGE & SEGREGATION**

No special requirements other than prescribed in section 9.3 of this Code.

If the bulkhead between the cargo space and the engine-room is not insulated to class A-60 standard, solvent extraction seed shall be stowed "away from" the bulkhead.

#### 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

This cargo shall only be accepted for loading when the cargo is substantially free from flammable solvent and a certificate from a person recognized by the competent authority of the country of shipment specifying the oil content and moisture content is issued.

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Before shipment, this cargo shall be properly aged; the duration of ageing required varies with the oil content. The temperature of this cargo shall be measured regularly at a number of depths in the cargo spaces and recorded during the voyage. If the temperature of the cargo reaches 55°C and continues to increase, ventilation to the cargo shall be stopped. If self-heating continues, then carbon dioxide or inert gas shall be introduced to the cargo space. In the case of solvent-extracted seed cakes the use of carbon dioxide or inert gas shall be withheld until it becomes apparent that fire is not liable to take place in the cargo space, to avoid the possibility of

ignition of solvent vapours. Entry of personnel into cargo spaces for this cargo shall not be permitted until tests have been carried out and it has been established that the oxygen content has been restored to a normal level. When the planned interval between the commencement of loading and the completion of discharge of this cargo exceeds 5 days, the cargo shall not be accepted for loading unless the cargo is to be carried in a cargo space equipped with facilities for introducing carbon dioxide or inert gas into the space. Smoking and the use of naked lights shall be prohibited in the vicinity of the cargo space during loading and unloading and on entry into the cargo spaces at any other time. Electrical circuits for equipment in cargo spaces which is unsuitable for use in an explosive atmosphere shall be isolated by removal of links in the system other than fuses. Spark-arresting screens shall be fitted to ventilators to the cargo spaces containing of this cargo.

## **VENTILATION**

Surface ventilation either natural or mechanical should be conducted, as necessary, for removing any residual solvent vapour. To prevent self-heating of the cargo, caution is required when using mechanical ventilation

## 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.

## **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

#### **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down. Use ship's fixed fire-fighting installation, if fitted.

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

#### REMARKS

In the case of solvent-extracted seed cake, the use of CO<sub>2</sub> should be withheld until fire is apparent.

The use of CO<sub>2</sub> is limited to controlling the fire and further amounts may need to be injected from time to time during the sea passage to reduce the oxygen content in the hold. On arrival in port, the cargo will need to be dug out to reach the seat of the fire.

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SEED CAKE UN 2217 with not more than 1.5% oil and not more than 11% moisture.

The range of oil and moisture content is indicated in the figure.



#### DESCRIPTION

Residue remaining after oil has been extracted by a solvent process from oil-bearing seeds. The cereals and cereal products included in this schedule are those derived from:

Bakery materials	Meal, oily
Barley malt pellets	Mill feed pellets
Beet	Niger seed, expellers
Bran pellets	Oil cake
Brewers grain pellets	Palm kernel
Citrus pulp pellets	Peanuts
Coconut	Pellets, cereal
Copra	Pollard pellets
Corn gluten	Rape seed
Cotton seed	Rice broken
Expellers	Rice bran
Gluten pellets	Safflower seed
Ground nuts, meal	Seed expellers, oily
Hominy chop	Soyabean
Linseed	Strussa pellets
Maize	Sunflower seed

The above may be shipped in the form of pulp, meals, cake, pellets, expellers.

The provisions of this entry should not apply to solvent-extracted rape seed meal pellets, soya bean meal, cotton seed meal and sunflower seed meal containing not more than 1.5% oil and not more than 11% moisture and being substantially free from flammable solvent. 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 for the exemption are met.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	478 to 719	1.39 to 2.09
SIZE	CLASS	GROUP
0.1 mm - 5 mm	4.2	В

### HAZARD

May self-heat slowly and, if wet or containing an excessive proportion of unoxidized oil, ignite spontaneously. Liable to oxidize, causing subsequent reduction of oxygen in the cargo space. Carbon dioxide may also be produced.

### **STOWAGE & SEGREGATION**

No special requirements other than prescribed in section 9.3 of this Code.

If the bulkhead between the cargo space and the engine-room is not insulated to class A-60 standard, this cargo shall be stowed "away from" the bulkhead.

### 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

This cargo shall only be accepted for loading when the cargo is substantially free from flammable solvent and a certificate from a person recognized by the competent authority of the country of shipment specifying the oil content and moisture content is issued.

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

The temperature of this cargo shall be measured regularly at a number of depths in the cargo spaces and recorded during the voyage. If the temperature of the cargo reaches 55°C and continues to increase, ventilation to the cargo shall be stopped. If self-heating continues, then carbon dioxide or inert gas shall be introduced to the cargo space. The use of carbon dioxide or inert gas shall be withheld until it becomes apparent that fire is not liable to take place in the cargo space, to avoid the possibility of ignition of solvent vapours. Entry of personnel into cargo spaces for this cargo shall not be permitted until tests have been carried out and it has been established that the oxygen content has been restored to a normal level. When the planned interval between the commencement of loading and the completion of discharge of this cargo space equipped with facilities for introducing carbon dioxide or inert gas into the space. Smoking and the use of naked lights shall be prohibited in the vicinity of the cargo space during loading and on entry into the cargo spaces at any other time. Electrical circuits for equipment in cargo spaces which is unsuitable for use in an explosive atmosphere, shall be

isolated by removal of links in the system other than fuses. Spark-arresting screens shall be fitted to ventilators to the cargo spaces containing of this cargo.

#### VENTILATION

Surface ventilation either natural or mechanical should be conducted, as necessary, for removing any residual solvent vapour. To prevent self-heating of the cargo caution is required when using mechanical ventilation.

### 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.

## **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down. Used ship's fixed fire-fighting installation, if fitted.

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

#### REMARKS

For solvent-extracted seed cake, the use of CO<sub>2</sub> should be withheld until fire is apparent.

The use of  $CO_2$  is limited to controlling the fire, and further amounts may need to be injected from time to time during passage to reduce the oxygen content in the hold. On arrival in port, the cargo will need to be dug out to reach the seat of the fire.

# SEED CAKE

(non-hazardous)

## DESCRIPTION

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.

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.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	478 to 719	1.39 to 2.09
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & SEGREGATION**

No special requirements.

#### 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 and 5 of the Code.

#### PRECAUTIONS

No special requirements.

#### VENTILATION

No special requirements.

### 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.

#### SILICOMANGANESE (low carbon) (with known hazard profile or known to evolve gases) (with silicon content of 25% or more)

#### DESCRIPTION

Silicomanganese is an extremely heavy cargo, silvery metallic material with a grey oxide coating.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	approx. 3000	0.18 to 0.26
SIZE	CLASS	GROUP
approx. 10 to 100 mm	MHB	В

### HAZARD

In contact with water 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.

Cargo is liable to reduce oxygen content in a cargo space. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & SEGREGATION**

Segregation as required for class 4.3 materials. "Separated from" foodstuffs and all class 8 liquids.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

#### WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

#### 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

The manufacturer or the shipper shall provide the master with a certificate stating that, after manufacture, the cargo was stored under cover, but exposed to open air for not less than three days prior to shipment. Smoking shall not be allowed on deck and in the cargo spaces and "NO SMOKING" signs shall be displayed on deck whenever this cargo is on board. 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. Whenever practicable, ventilation systems for the living quarters shall be shut down or screened and air condition systems shall be placed on recirculation during loading and discharge of this cargo, 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 of this cargo may come in contact with moving parts of deck machinery and external navigation aids such as navigation lights.

Entry of personnel into enclosed spaces should not be permitted until tests have been carried out and it has been established that the oxygen content has been restored to a normal level throughout the space and that no toxic gas is present, unless adequate ventilation and air circulation throughout the free space above the material has been effected. See appendix 6 in this Code for general precautions and procedures for entering enclosed spaces.

Prohibition of smoking in dangerous areas should be enforced, and clearly legible "NO SMOKING" signs should be displayed.

Electrical fittings and cables should 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 should be sealed against the passage of gas and vapour.

Whenever possible, ventilation systems should 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 should 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).

#### VENTILATION

Mechanical surface ventilation shall be conducted during the voyage, as necessary, for the cargo spaces carrying this cargo.

#### CARRIAGE

For quantitative measurements of oxygen and flammable gases liable to be evolved by the cargo, a suitable detector for each gas or combination of gases shall be on board while this cargo is carried. The detector shall be suitable for use in an atmosphere without oxygen and 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.

# DISCHARGE

No special requirements.

## **CLEAN-UP**

No special requirements.

## **EMERGENCY PROCEDURES**

## **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Self-contained breathing apparatus.

## EMERGENCY PROCEDURES

Wear self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down and use CO<sub>2</sub> if available. Do not use water.

## MEDICAL FIRST AID

Refer to Medical First Aid Guide (MFAG), as amended.

#### REMARKS

Material is virtually non-combustible when dry.

## SODA ASH (Dense and light)

#### **DESCRIPTION**

Powdery; composed of white, odourless grains and dust. It is made by the combustion of salt and limestone. Soluble in water. Soda ash is ruined on contact with oil.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	599 to 1053	0.95 to 1.67
SIZE	CLASS	GROUP
Powdery	Not applicable	С

### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

### **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

#### LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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**

After discharge of this cargo, the cargo spaces shall be swept clean except in cases where the cargo to be loaded has the same BCSN of the cargo to be loaded subsequent to discharge is SODA ASH. The residues of this cargo may be pumped as slurry during washing out.

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### **SODIUM NITRATE UN 1498**

#### **DESCRIPTION**

Colourless, transparent, odourless crystals. Hygroscopic and soluble in water.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	508 to 719	1.39 to 1.97
SIZE	CLASS	GROUP
Not applicable	5.1	В

#### HAZARD

Although non-combustible, mixtures with combustible material are readily ignited and may burn fiercely.

This cargo is hygroscopic and will cake if wet.

#### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

#### 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 and 5 of the Code.

#### PRECAUTIONS

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

#### CARRIAGE

No special requirements.

#### DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

#### **CLEAN-UP**

No special requirements.

#### **EMERGENCY PROCEDURES**

#### **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus. Spray nozzles.

### EMERGENCY PROCEDURES

Wear protective clothing and self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Use copious quantities of water, which is best applied in the form of a spray to avoid disturbing the surface of the material. The material may fuse or melt, in which condition application may result in extensive scattering of the molten material. Exclusion of air or the use of CO<sub>2</sub> will not control the fire. Due consideration should be given to the effect on the stability of the ship due to accumulated water.

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

## REMARKS

This material is non-combustible unless contaminated.

#### SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE UN 1499

#### DESCRIPTION

A hygroscopic mixture, soluble in water.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
30°	1136	0.88
SIZE	CLASS	GROUP
Not applicable	5.1	В

#### HAZARD

Although non-combustible, mixtures with combustible material may readily ignite and burn fiercely.

This cargo is hygroscopic and will cake if wet.

#### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

#### 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 and 5 of the Code.

#### PRECAUTIONS

Due regard shall be paid to prevent contact of the cargo and combustible materials. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

#### CARRIAGE

No special requirements.

### DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

### **CLEAN-UP**

No special requirements.

### **EMERGENCY PROCEDURES**

### SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus. Spray nozzles.

## **EMERGENCY PROCEDURES**

Wear protective clothing and self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Use copious quantities of water, which is best applied in the form of a spray to avoid disturbing the surface of the material. The material may fuse or melt, in which condition application of water may result in extensive scattering of the molten materials. Exclusion of air or the use of CO<sub>2</sub> will not control the fire. Due consideration should be given to the effect on the stability of the ship due to the accumulated water.

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

#### REMARKS

Material is non-combustible unless contaminated.

### STAINLESS STEEL GRINDING DUST

#### **DESCRIPTION**

Brown lumps: Moisture content 1% to 3%. May give off dust.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2381	0.42
SIZE	CLASS	GROUP

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop is not overstressed during voyage and during loading by a pile of the cargo.

#### PRECAUTIONS

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, 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. I:\MSC\84\24-Add-3.doc

#### **STONE CHIPPINGS**

#### DESCRIPTION

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1408	0.71
SIZE	CLASS	GROUP
Fines to 25 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

### **STOWAGE & 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.

#### SUGAR

#### **DESCRIPTION**

Depending on type, sugar may be either brown or white granules, with a very low moisture content to the order of 0% to 0.05%.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	625 to 1000	1.00 to 1.60
SIZE	CLASS	GROUP
Granules-up to 3 mm	Not applicable	С

#### HAZARD

As sugar dissolves in water, ingress of water may result in the creation of air pockets in the body of the cargo with the ship's motion. The hazards are then similar to the hazards presented by cargoes which may liquefy. In case of ingress of water into the holds, the risk to the stability of the ship through dissolution of sugar (formation of a liquid base and shifting of cargo), should be recognized. This cargo is highly soluble.

### **STOWAGE & SEGREGATION**

No special requirements.

#### HOLD CLEANLINES

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 this cargo is loaded or to be loaded shall be closed.

#### 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

After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed to prevent water ingress, as necessary.

#### DISCHARGE

No special requirements.

**CLEAN-UP** No special requirements.

### SULPHATE OF POTASH AND MAGNESIUM

#### **DESCRIPTION**

Granular light brown material. Solution in water is almost neutral. May have a slight odour, depending on the process of manufacturer. Melting point: 72°C. Moisture: 0.02%.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1000 to 1124	0.89 to 1.00
SIZE	CLASS	GROUP
Not applicable	Not applicable	С

#### HAZARD

No special hazards. This cargo is highly soluble. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & SEGREGATION**

No special requirements.

#### 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

The cargo shall be trimmed in accordance with the cargo information required by section 4 of this Code. If doubt exists, trim reasonably level to the boundaries of the cargo space so as to minimize the risk of shifting and to ensure that adequate stability will be maintained during the voyage.

**PRECAUTIONS** No special requirements.

**VENTILATION** No special requirements.

**CARRIAGE** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

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### SULPHUR UN 1350 (lump and coarse grained)

### DESCRIPTION

A mineral substance found free in volcanic countries. Yellow in colour, brittle, insoluble in water, but readily fusible by heat. Sulphur is loaded in a damp or wet condition.

### Note: Fine grained sulphur (flowers of sulphur) shall not be transported in bulk.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1053 to 1176	0.85 to 0.95
SIZE	CLASS	GROUP
Slate to 10 mm granules & prills to 5 mm	4.1	В

## HAZARD

Flammability and dust explosion especially during loading and unloading and after discharge and cleaning.

This cargo may ignite readily.

This cargo is non-combustible or has a low fire-risk.

## **STOWAGE & SEGREGATION**

"Separated from" foodstuffs.

## HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo. Must be thoroughly clean and washed with fresh water.

## WEATHER PRECAUTIONS

No special requirements.

## LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

When this cargo is involved in a fire, a toxic, very irritating and suffocating gas is evolved. This cargo forms explosive and sensitive mixtures with most oxidizing material. This cargo has a liability to dust explosion, which may occur especially after discharge and during cleaning. The hold trimming plates and tank tops of the cargo spaces for this cargo shall be limewashed or coated with paint to prevent corrosion. Upper sections shall have a sound coating of paint. Electrical circuits for the equipment in cargo spaces for this cargo which is unsuitable for use in an explosive atmosphere shall be isolated by removal of links in the system other than fuses. Due consideration shall be paid on the isolation of electrical circuits for the equipment in the adjacent spaces of the cargo spaces for this cargo shall be fitted with spark-arresting screens.

Fine grained sulphur (flowers of sulphur) **shall not** be transported in bulk. I:\MSC\84\24-Add-3.doc

#### VENTILATION

Surface ventilation only, either natural or mechanical, shall be conducted, as necessary, during the voyage for this cargo.

#### CARRIAGE

Bilges in the cargo spaces carrying this cargo shall be pumped regularly to prevent accumulation of water/acid solution.

### DISCHARGE

No special requirements.

### **CLEAN-UP**

The cargo spaces and other structures which may have been in contact with this cargo or the dust shall not be swept. After discharge of this cargo, the cargo spaces, and other structures as necessary, shall be washed out with fresh water to remove all residues of this cargo. Then the cargo spaces shall be thoroughly dried. Wet dust or residues may form highly corrosive sulphurous acid, which is extremely dangerous to personnel and corrosive to steel. Persons involved in cleaning up shall be provided with protective clothing, goggles and facemasks to wear.

## **EMERGENCY PROCEDURES**

## **SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED**

Self-contained breathing apparatus.

## **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down; use ship's fixed fire-fighting installation if available. Exclusion of air may be sufficient to control the fire. **Do not use water**.

# MEDICAL FIRST AID

Refer to the Medical First Aid (MFAG), as amended.

#### SUPERPHOSPHATE

#### **DESCRIPTION**

Greyish-white. Moisture: 0% to 7%. Hygroscopic.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
30° to 40°	1000 to 1190	0.81 to 1.00
SIZE	CLASS	GROUP
Granular, fines and powder to 0.15 mm diameter	Not applicable	С

### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet.

### **STOWAGE & SEGREGATION**

No special requirements.

#### 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 and 5 of the Code.

## PRECAUTIONS

The hold trimming plates and tank tops of the cargo spaces for this cargo shall be lime washed or coated with paint to prevent corrosion.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

## CARRIAGE

Moisture from condensation, cargo heating or leaking hatchcovers may cause formation of phosphoric or phosphorous acid which may cause corrosion to steelwork. After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed, as necessary. This cargo will decompose burlap or canvas cloth covering bilge wells.

## DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

## **CLEAN-UP**

After discharge of this cargo, particular attention shall be paid to bilge wells of the cargo spaces.

### **SUPERPHOSPHATE** (triple, granular)

#### DESCRIPTION

Granular in form, dark grey colour and, depending on its source, can be dusty. Hygroscopic.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	813 to 909	1.10 to 1.23
SIZE	CLASS	GROUP
2 mm to 4 mm	Not applicable	С

### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet.

## **STOWAGE & SEGREGATION**

No special requirements.

#### 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 and 5 of the Code.

#### PRECAUTIONS

Hold trimming plates and tank tops should be lime washed to prevent corrosion.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

#### CARRIAGE

Moisture from condensation, cargo heating or leaking hatchcovers may cause formation of phosphoric or phosphorous acid which may cause corrosion to steelwork. After the completion of loading of this cargo, the hatches of the cargo spaces shall be sealed, as necessary. This cargo will decompose burlap or canvas cloth covering bilge wells.

#### DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

#### **CLEAN-UP**

Pay particular attention to bilge wells.

#### TACONITE PELLETS

#### **DESCRIPTION**

Ore. Grey, round steel pellets. Moisture: 2%.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	599 to 654	1.53 to 1.67
SIZE	CLASS	GROUP
Pellets to 15 mm diameter	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

### **STOWAGE & 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.

## TALC

### **DESCRIPTION**

Talc is an extremely soft, whitish, green or greyish natural hydrated magnesium silicate. It has a characteristic soapy, or greasy feel.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1370 to 1563	0.64 to 0.73
SIZE	CLASS	GROUP
Powdery to 100 mm lumps	Not applicable	С

### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

### **STOWAGE & 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.

#### TANKAGE

#### DESCRIPTION

The dried sweeping of animal matter from slaughterhouse floors. Very dusty.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	-	-
SIZE	CLASS	GROUP
Not applicable	MHB	В

#### HAZARD

Subject to spontaneous heating and possible ignition. Possibly infectious.

#### **STOWAGE & SEGREGATION**

Segregation as required for class 4.2 materials. "Separated by a complete cargo space or hold from" foodstuffs.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

#### WEATHER PRECAUTIONS

No special requirements.

#### 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. Do not load if the temperature is above 38°C.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 temperature of this cargo shall be measured daily during voyage. The results of measurements shall be recorded to check possible self-heating heating.

#### DISCHARGE

No special requirements.

# CLEAN-UP

No special requirements.

## **EMERGENCY PROCEDURES**

## SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Self-contained breathing apparatus.

## **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down; use ship's fixed fire-fighting installation. Use full protective clothing in case of fire situation.

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

### TAPIOCA

#### **DESCRIPTION**

Dry, dusty mixture of powder and granules.

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
32°	735	1.36
SIZE	CLASS	GROUP
Powder and granules	Not applicable	С

#### HAZARD

May heat spontaneously with oxygen depletion in the cargo space. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

### CARRIAGE

No special requirements.

#### DISCHARGE

No special requirements.

#### **CLEAN-UP**

No special requirements.

#### UREA

#### DESCRIPTION

White, granular, and odourless commodity. Moisture content is less than 1%. Hygroscopic.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
28° to 45°	645 to 855	1.17 to 1.56
SIZE	CLASS	GROUP
1 mm to 4 mm	Not applicable	С

#### HAZARD

No special hazards.

This cargo is non-combustible or has a low fire-risk.

This cargo is hygroscopic and will cake if wet.

Urea (either pure or impure) may, in the presence of moisture, damage paintwork or corrode steel.

#### **STOWAGE & 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 this cargo is loaded or to be loaded shall be closed.

#### LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTION

No special requirements.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

#### CARRIAGE

No special requirements.

#### DISCHARGE

If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

#### **CLEAN-UP**

After discharge of this cargo, the cargo spaces shall be swept, washed out and dried.

#### VANADIUM ORE

#### DESCRIPTION

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1786	0.560
SIZE	CLASS	GROUP
Not applicable	MHB	В

#### HAZARD

Dust may be toxic. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & SEGREGATION**

Segregation as required for class 6.1 materials. "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.

#### PRECAUTIONS

Exposure of persons to dust should be minimized.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 No special requirements.

DISCHARGE

No special requirements.

**CLEAN-UP** No special requirements.

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#### **EMERGENCY PROCEDURES**

#### SPECIAL EMERGENCY EQUIPMENT TO BE CARRIED

Self-contained breathing apparatus.

### **EMERGENCY PROCEDURES**

Wear self-contained breathing apparatus.

### **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.

#### VERMICULITE

#### DESCRIPTION

A mineral of the mica group. Grey. Average moisture: 6% to 10%. May give off dust.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	730	1.37
SIZE	CLASS	GROUP
3 mm	Not applicable	С

#### HAZARD

No special hazards.

This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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 protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

Prior to loading, a certificate based on test shall be provided by the manufacturer or shipper stating that the asbestos content is less than 1%.

#### VENTILATION

No special requirements.

CARRIAGE

No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

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#### WHITE QUARTZ

#### **DESCRIPTION**

99.6% silica content.

### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	1639	0.61
SIZE	CLASS	GROUP
Lumps to 150 mm	Not applicable	С

#### HAZARD

No special hazards. This cargo is non-combustible or has a low fire-risk.

### **STOWAGE & 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.
#### WOODCHIPS

#### DESCRIPTION

Natural timber mechanically chipped into the approximate size of a business card.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	326	3.07
SIZE	CLASS	GROUP
As above	MHB	В

#### HAZARD

This material possesses a chemical hazard. Some shipments may be subject to oxidation leading to depletion of oxygen and increase of carbon dioxide in cargo and adjacent spaces.

With moisture content of 15% or more this cargo has a low fire-risk. As the moisture content decreases the fire risk increases. When dry, woodchips can be easily ignited by external sources; are readily combustible and can ignite by friction.

#### **STOWAGE & SEGREGATION**

Segregation as for class 4.1 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.

#### PRECAUTIONS

Entry of personnel into the cargo spaces containing this cargo shall not be permitted until tests have been carried out and it has been established that the oxygen content has been restored to a normal level. In dry weather, dust, which settles on deck, will dry out quickly and becomes readily ignitable. Appropriate precautions shall be taken to prevent fire.

#### 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

Nil

## **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.

#### MEDICAL FIRST AID

Refer to Medical First Aid Guide (MFAG), as amended.

#### WOOD PELLETS

#### DESCRIPTION

The Wood Pellets are light blond to chocolate brown in colour; very hard and cannot be easily squashed. Wood Pellets have a typical specific density between 1,100 to 1,700 kg/m<sup>3</sup> and a bulk density of 600 to 750 kg/m<sup>3</sup>. Wood Pellets are made of sawdust, planer shavings and other wood waste such as bark coming out of the lumber manufacturing processes. Normally there are no additives or binders blended into the pellet, unless specified. The raw material is fragmented, dried and extruded into pellet form. The raw material is compressed approximately 3.5 times and the finished Wood Pellets typically have a moisture content of 4 to 8%. Wood Pellets are used as a fuel in district heating and electrical power generation as well as a fuel for small space heaters such as stoves and fireplaces.

Wood Pellets are also used as animal bedding due to the absorption characteristics. Such Wood Pellets typically have a moisture content of 8 to 10%.

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Approximately 30 degrees	600 to 750	1.4 to 1.6
SIZE	CLASS	GROUP
Cylindrical with 3 to 12 mm Diameter: 10 to 20 mm	MHB	В

#### CHARACTERISTICS

#### HAZARD

Shipments may be subject to oxidation leading to depletion of oxygen and increase of carbon monoxide and carbon dioxide in cargo and communicating spaces.

Swelling if exposed to moisture. Wood Pellets may ferment over time if moisture content is over 15% leading to generation of asphyxiating and flammable gases which may cause spontaneous combustion.

Handling of Wood Pellets may cause dust to develop. Risk of explosion at high dust concentration.

#### **STOWAGE AND SEGREGATION**

Segregate 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 and 5 of the Code.

#### PRECAUTIONS

Entry of personnel into the cargo spaces containing this cargo or the connecting spaces shall not be permitted until tests have been carried out and it has been established that the oxygen content has been restored to a normal level. The close or direct contact of this cargo and cargo hold lighting such as hot halogen lamps shall be avoided. Fuses to such lights shall be removed or secured while this cargo is present in the cargo space. Precautions shall be taken to prevent generation of high concentrations of dust during handling and cleaning of this cargo.

#### VENTILATION

The cargo spaces carrying this cargo shall not be ventilated during voyage.

#### 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

Oxygen or combined carbon monoxide/dioxide meter when entering confined spaces, which has not been properly ventilated.

## **EMERGENCY PROCEDURES**

Nil

## **EMERGENCY ACTION IN THE EVENT OF FIRE**

Batten down; use ship's fixed fire-fighting installation. 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.

#### WOOD PULP PELLETS

#### DESCRIPTION

The pellets are brown in colour; very hard and cannot be easily squashed. They are light and are about half the size of a bottle cork. The pellets are made of compacted woodchips.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)	
Not applicable	326	3.07	
SIZE	CLASS	GROUP	
approx. 15 mm x 20 mm	MHB	В	

#### HAZARD

This cargo possesses a chemical hazard. Some shipments may be subject to oxidation leading to depletion of oxygen and increase of carbon dioxide in cargo and adjacent spaces. With moisture content of 15% or more this cargo has a low fire-risk. As the moisture content decreases, the fire risk increases.

#### **STOWAGE & SEGREGATION**

Segregate as for class 4.1 materials.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

## WEATHER PRECAUTIONS

No special requirements.

#### LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

#### PRECAUTIONS

Entry of personnel into the cargo spaces containing this cargo shall not be permitted until tests have been carried out and it has been established that the oxygen content has been restored to a normal level. In dry weather, dust, which settles on deck, will dry out quickly and becomes readily ignitable. Appropriate precautions shall be taken to prevent fire.

#### 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**

Nil

## **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.

## **MEDICAL FIRST AID**

Refer to the Medical First Aid Guide (MFAG), as amended.

#### ZINC ASHES UN 1435

Shipments require the approval of the competent authority of the countries of shipment and the flag State of the ship.

#### DESCRIPTION

## CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	900	1.11
SIZE	CLASS	GROUP
Not applicable	4.3	В

#### HAZARD

In contact with moisture or water liable to give off hydrogen, a flammable gas, and toxic gases. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & SEGREGATION**

"Separated from" foodstuffs and all class 8 liquids.

#### HOLD CLEANLINESS

Clean and dry as relevant to the hazards of the cargo.

#### WEATHER PRECAUTIONS

This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

#### LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code. This cargo shall not be accepted for loading when the cargo is damp or known to have been wetted.

#### PRECAUTIONS

Reject any damp material or any material which is known to have been wetted. Possible ignition sources, including hotwork, burning, smoking, electrical sparking, shall be eliminated in the vicinity of the cargo spaces containing this cargo during handling and carriage of this 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.

#### CARRIAGE

For quantitative measurements of hydrogen, a suitable detector shall be on board while this cargo is carried. The detector shall be of certified safe type for use in explosive atmosphere. The concentration of hydrogen 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.

#### DISCHARGE

No special requirements.

#### **CLEAN-UP**

After discharge of this cargo, the cargo spaces shall be swept clean twice. Water shall not be used for cleaning of the cargo space which has contained this cargo, because of danger of gas.

## **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**

Batten down; use ship's fixed fire-fighting installation if available. **Do not use water.** 

## MEDICAL FIRST AID

Refer to the Medical First Aid Guide (MFAG), as amended.

#### ZIRCONSAND

#### DESCRIPTION

Usually fine white to yellow, very abrasive extracted from ilmenite sand. May be dusty. Shipped dry.

#### CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m <sup>3</sup> )	STOWAGE FACTOR (m <sup>3</sup> /t)
Not applicable	2600 to 3000	0.33 to 0.36
SIZE	CLASS	GROUP
0.15 mm or less	Not applicable	С

#### HAZARD

No special hazard. This cargo is non-combustible or has a low fire-risk.

#### **STOWAGE & 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 during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed.

#### 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 tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution. Due consideration shall be paid to ensure that tanktop 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.

Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress 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** No special requirements.

**DISCHARGE** No special requirements.

**CLEAN-UP** No special requirements.

## **APPENDIX 2**

## LABORATORY TEST PROCEDURES, ASSOCIATED APPARATUS AND STANDARDS

#### **1** Test procedures for materials which may liquefy and associated apparatus

Three methods of testing for the Transportable moisture limit are currently in general use:

- .1 flow table test;
- .2 penetration test;
- .3 Proctor/Fagerberg test.

As each method has its advantages, the selection of the test method should be determined by local practices or by the appropriate authorities.

## **1.1** *Flow table test procedure*

1.1.1 *Scope* 

The flow table is generally suitable for mineral concentrates or other fine material with a maximum grain size of 1 mm. It may also be applicable to materials with a maximum grain size up to 7 mm. It will not be suitable for materials coarser than this and may also not give satisfactory results for some materials with high clay content. If the flow table test is not suitable for the material in question, the procedures to be adopted should be those approved by the authority of the port State.

The test described below provides for determination of:

- .1 the moisture content of a sample of cargo, hereinafter referred to as the test material;
- .2 the flow moisture point (FMP) of the test material under impact or cyclic forces of the flow table apparatus; and
- .3 the transportable moisture limit of the test material.

- 1.1.2 Apparatus (see figure 1.1.2)
  - .1 Standard flow table and frame (ASTM Designation (C230-68) see 3).



Figure 1.1.2 Flow table and accessory apparatus

- .2 Flow table mounting (ASTM Designation (C230-68) see 3).
- .3 Mould (ASTM Designation (C230-68) see 3).
- .4 Tamper (see figure 1.1.2.4): the required tamping pressure may be achieved by using calibrated, spring-loaded tampers (examples are included in figure 1.1.2.4) or some other suitable design of tamper that allows a controlled pressure to be applied via a 30 mm diameter tamper head.
- .5 Scales and weights (ASTM Designation (C109-73) see 3) and suitable sample containers.
- .6 Glass graduated measuring cylinder and burette having capacities of 100-200 ml and 10 ml, respectively.
- .7 A hemispherical mixing bowl approximately 30 cm diameter, rubber gloves and drying dishes or pans. Alternatively, an automatic mixer of similar capacity can be used for the mixing operations. In this case, care should be exercised to ensure that the use of such a mechanical mixer does not reduce the particle size or consistency of the test material.
- .8 A drying oven with controlled temperature up to approximately 110°C. This oven should be without air circulation.



Figure 1.1.2.4 Examples of spring-loaded tampers

## 1.1.3 Temperature and humidity

It is preferable to work in a room where the samples will be protected from excessive temperatures, air currents and humidity variations. All phases of the material preparation and testing procedure should be accomplished in a reasonable space of time to minimize moisture losses and, in any event, within the day of commencement. Where possible, sample containers should be covered with plastic film or other suitable cover.

#### 1.1.4 Procedure

The quantity of material required for a flow moisture test will vary according to the specific gravity of the material to be tested. It will range from approximately 2 kg for coal to 3 kg for mineral concentrates. It should be collected as a representative sample of the cargo being shipped. Experience has shown that more accurate test results will be obtained by ensuring that the moisture content of the test sample is increased rather than decreased towards the FMP.

Consequently, it is recommended that a preliminary flow moisture test should be conducted, generally in accordance with the following, to indicate the condition of the test sample, i.e., the quantity of water and the rate at which it is to be added or whether the sample should be air-dried to reduce its moisture content before commencing the main flow moisture test.

#### 1.1.4.1 Preparation of the test sample

The representative sample of test material is placed in the mixing bowl and thoroughly mixed. Three subsamples (A), (B) and (C) are removed from the mixing bowl as follows: about one fifth of the sample (A) should be immediately weighed and placed in the drying oven to determine the moisture content of the sample "as received". Two further subsamples, each of about two fifths of the gross weight, should then be taken, one (B) for the preliminary FMP test and the other (C) for the main FMP determination:

.1 *Filling the mould*. The mould is placed on the centre of the flow table and filled in three stages with the material from the mixing bowl. The first charge, after tamping, should aim to fill the mould to approximately one third of its depth. The quantity of sample required to achieve this will vary from one material to another, but can readily be established after some experience has been gained of the packing characteristics of the material being tested.

The second charge, after tamping, should fill the mould to about two thirds of its depth and the third and final charge, after tamping, should reach to just below the top of the mould (see figure 1.1.4.2).

.2 *Tamping procedure*. The aim of tamping is to attain a degree of compaction similar to that prevailing at the bottom of a shipboard cargo of the material being tested. The correct pressure to be applied is calculated from:

Tamping pressure (Pa) = Bulk density of cargo (kg/m<sup>3</sup>) x Maximum depth of cargo (m) x Gravity acceleration (m/s<sup>2</sup>)

Bulk density can be measured by a single test, using the Proctor C apparatus described in ASTM Standard D-698 or JIS-A-1210, on a sample of the cargo at the proposed moisture content of loading.

When calculating the tamping pressure, if no information concerning cargo depth is available the maximum likely depth should be used.

Alternatively, the pressure may be estimated from table 1.1.4.1.

The number of tamping actions (applying the correct, steady pressure each time) should be about 35 for the bottom layer, 25 for the middle and 20 for the top layer, tamping successively over the area completely to the edges of the sample to achieve a uniformly flat surface for each layer.

.3 *Removal of the mould*. The mould is tapped on its side until it becomes loose, leaving the sample in the shape of a truncated cone on the table.

Table 1.1.4.1

	Bulk	Maximum cargo depth			
Typical cargo	density (kg/m <sup>3</sup> )	2 m	<b>5 m</b> Tamper pre	<b>10 m</b> essure (kPa)	20 m
Coal	1000	20 (1.4)	50 (3.5)	100 (7.1)	200 (14.1)
	2000	40 (2.8)	100 (7.1)	200 (14.1)	400 (28.3)
Metal ore	3000	60 (4.2)	150 (10.6)	300 (21.2)	600 (42.4)
Iron ore conc.	4000	80 (5.7)	200 (14.1)	400 (28.3)	800 (56.5)
Lead ore conc.	5000	100 (7.1)	250 (17.7)	500 (35.3)	1000 (70.7)
(values in parenthesis are equivalent kgf when applied via a 30 mm diameter tamper head)					

1.1.4.2 The preliminary flow moisture test:

- .1 Immediately after removing the mould, the flow table is raised and dropped up to 50 times through a height of 12.5 mm at a rate of 25 times per minute. If the material is below the FMP, it usually crumbles and bumps off in fragments with successive drops of the table (see figure 1.1.4-3).
- .2 At this stage, the flow table is stopped and the material returned to the mixing bowl, where 5-10 ml of water, or possibly more, is sprinkled over the surface and thoroughly mixed into the material, either with rubber-gloved fingers or an automatic mixer.

The mould is again filled and the flow table is operated as described in 1.1.4.2.1 for up to 50 drops. If a flow state is not developed, the process is repeated with further additions of water until a flow state has been reached.

.3 *Identification of a flow state.* The impacting action of the flow table causes the grains to rearrange themselves to produce compaction of the mass. As a result, the fixed volume of moisture contained in the material at any given level increases as a percentage of the total volume. A flow state is considered to have been reached when the moisture content and compaction of the sample produce a level of saturation such that plastic deformation occurs<sup>\*</sup>. At this stage, the moulded sides of the sample may deform, giving a convex or concave profile (see figure 1.1.4-4).

<sup>\*</sup> In certain conditions, the diameter of the cone may increase before the flow moisture point is reached, due to low friction between the grains rather than to plastic flow. This must not be mistaken for a flow state.

With repeated action of the flow table, the sample continues to slump and to flow outwards. In certain materials, cracks may also develop on the top surface. Cracking, with the appearance of free moisture, is not, however, an indication of development of a flow state. In most cases, measurement of the deformation is helpful in deciding whether or not plastic flow has occurred. A template which, for example, will indicate an increase in diameter of up to 3 mm in any part of the cone is a useful guide for this purpose. Some additional observations may be useful. For example: when the (increasing) moisture content is approaching the FMP, the sample cone begins to show a tendency to stick to the mould. Further, when the sample is pushed off the table, the sample may leave tracks (stripes) of moisture on the table. If such stripes are seen, the moisture content may be above the FMP: the absence of tracks (stripes) is not necessarily an indication of being below the FMP.

Measuring the diameter of the cone, at the base or at half height, will always be useful. By addition of water in increments of 0.4% to 0.5% and applying 25 drops of the flow table, the first diameter increase will generally be between 1 and 5 mm and after a further increment of water the base diameter will have expanded by between 5 and 10 mm.

.4 As an alternative to the procedure described above, for many concentrates a fast way of finding the approximate FMP is as follows:

When the moisture content is definitely beyond the FMP, measure the diameter after 25 drops, repeat the test after adding a further increment of water, measure the diameter and draw a diagram as illustrated in figure 1.1.4-1, showing increase in diameter plotted against moisture content. A straight line drawn through the two points will cross the moisture content axis close to the FMP.

Having completed the preliminary FMP test, the sample for the main test is adjusted to the required level of moisture content (about 1% to 2%) below the flow point.

1.1.4.3 Main flow moisture test

When a flow state has been reached in the preliminary test, the moisture content of sub-sample (C) is adjusted to about 1% to 2% less than the last value which did not cause flow in the preliminary test (this is suggested simply to avoid starting the main test too close to the FMP and then having to waste time air-drying it and starting again). The final test is then carried out on this adjusted sample in the same manner as for the preliminary test, but in this case with the addition of water in increments of no more than 0.5% of the mass of the test material (the lower the "preliminary" FMP, the smaller the increments should be). After each stage, the whole moulded sample should be placed in a container, weighed immediately and retained for moisture determination if required. This will be necessary if the sample flowed or if the next, slightly wetter, sample flows. If not required it may be returned to the mixing bowl.

When a flow state has been reached, the moisture content should be determined on two samples, one with moisture content just above the FMP and the other with moisture content just below the FMP. The difference between the two values should then be 0.5% or less, and the FMP is taken as the mean of these two values.



Figure 1.1.4-1



Figure 1.1.4-2



Figure 1.1.4-3



Figure 1.1.4-4

## 1.1.4.4 Determination of moisture content

## Introduction

It should be noted that, for many materials, there are recognized international and national methods for determining moisture content. These methods, or ones that have been established to give equivalent results, should be followed.

## Concentrates and similar materials

It is clearly important that the samples should be dried to a constant mass. In practice, this is ascertained after a suitable drying period at 105°C by weighing the sample successively with an interval of several hours elapsing. If the mass remains constant, drying has been completed, whereas if the mass is still decreasing, drying should be continued.

The length of the drying period depends upon many variables, such as the disposition of the material in the oven, the type of container used, the particle size, the rate of heat transfer, etc. It may be that a period of five hours is ample for one concentrate sample, whereas it is not sufficient for another. Sulphide concentrates tend to oxidize, and therefore the use of drying ovens with air circulation systems is not recommended for these materials, nor should the test sample be left in the drying oven for more than four hours.

#### Coal

The recommended methods for determination of the moisture content are those described in ISO 589-1974, "Hard Coal – Determination of Total Moisture". This method, or ones that have been established to give equivalent results, should be followed.

Calculation of moisture content, FMP and transportable moisture limit:

Taking  $m_1$  as the exact mass of the subsample "as received" (see 1.1.4.1),

Taking  $m_2$  as the exact mass of the "as received" subsample, after drying,

Taking  $m_3$  as the exact mass of the sample just above the flow state (see 1.1.4.3),

Taking  $m_4$  as the exact mass of the sample just above the flow state, after drying,

Taking  $m_5$  as the exact mass of the sample just below the flow state (see 1.1.4.3),

Taking  $m_6$  as the exact mass of the sample just below the flow state, after drying,

Then:

.1 The moisture content of the concentrate "as received" is:

$$\frac{(m_1 - m_2)}{m_1} \times 100, \text{ in per cent}$$
(1.1.4.4.1)

.2 The FMP of the material is:

$$\frac{(m_3 - m_4)}{m_3} + \frac{m_5 - m_6}{m_5} \times 100, in \ per \ cent$$
(1.1.4.4.2)

.3 The transportable moisture limit of the material is 90% of the FMP.

## **Peat Moss**

For all Peat Moss, determine the bulk density, using either the ASTM or CEN (20 litres) method.

Peat should be above or below 90kg/cubic metre on a dry weight basis in order to obtain the correct TML.

As indicated in 1.1.1, the following should be determined:

- .1 the moisture content of a sample of cargo (MC);
- .2 the flow moisture point (FMP);
- .3 the transportable moisture limit (TML). The TML will be determined as follows:
  - .3.1 for peat with a bulk density of greater than 90 kg/cubic metre on a dry weight is 85% of the FMP; and
  - .3.2 for peat with a bulk density of 90 kg/cubic metre or less on a dry weight, the TML is 90% of the FMP.

#### **1.2** *Penetration test procedure*

The penetration test constitutes a procedure whereby a material in a cylindrical vessel is vibrated. The flow moisture point is determined on the basis of the penetration depth of an indicator.

#### 1.2.1 *Scope*

- .1 The penetration test is generally suitable for mineral concentrates, similar materials, and coals up to a top size of 25 mm.
- .2 In this procedure, the sample, in a cylindrical vessel, is subjected to vertical vibration of  $2g \ rms \pm 10\%$  (g = gravity acceleration) for 6 minutes. When the penetration depth of a bit put on the surface exceeds 50 mm, it is judged that the sample contains a moisture greater than the flow moisture point.
- .3 This procedure consists of a preliminary test to get an approximate value of the flow moisture point and a main test to determine the accurate flow moisture point. When the approximate value of the flow moisture point is known, the preliminary test can be omitted.
- .4 The room where the samples are tested should be prepared as mentioned in 1.1.3.

#### 1.2.2 Apparatus (see figure 1.2.2)

- .1 The test apparatus consists of:
  - .1 a vibrating table;

- .2 cylindrical vessels;
- .3 indicators (penetration bits and a holder);
- .4 a tamper (see 1.1.2.4); and
- .5 ancillary equipment (see 1.1.2.5 to .8).
- .2 The vibrator (see figure 1.2.2.2), with a table on which a cylindrical vessel can be clamped, should be capable of exciting a mass of 30 kg at a frequency of either 50 Hz or 60 Hz with an acceleration of 3g rms or more, and it can be controlled to adjust the acceleration level.
- .3 Dimensions of cylindrical vessels (see figures 1.2.2.3-1 and 1.2.2.3-2) are as follows:

Cylinder size	Inner diameter	Depth	Wall thickness
small	146 mm	202 mm	9.6 mm or more
large	194 mm	252 mm	10.3 mm or more
large	194 mm	252 mm	10.3 mm or 1

The vessels should be made of reasonably rigid, non-magnetic, impermeable and lightweight material such as acrylics or vinyl chloride.

The small cylindrical vessel is selected for the materials having a maximum particle size of 10 mm or less. The large cylindrical vessel is for those having a maximum particle size of 25 mm or less.

- .4 Penetration bits (see figure 1.2.2.4) are made of brass. The mass of the bit for coal should be adjusted to 88 g (5 kPa), and that for concentrates to 177 g (10 kPa). When the sample contains coarse particles, it is recommended that two bits of the same pressure are put on the surface to avoid misjudgment.
- .5 A holder (see figure 1.2.2.5) should be made to guide the rod of a bit with minimum friction to the centre of a cylindrical vessel. When two bits are used, they should be positioned in accordance with figure 1.2.2.
- .6 A cylindrical vessel and penetration indicators should be selected in accordance with the nature and condition of the test sample, viz. size of particles and bulk density.

## 1.2.3 *Procedure*

- 1.2.3.1 Preparation of the test sample and the vibrating table:
  - .1 The quantity of the sample required is approximately six times or more the capacity of the selected cylindrical vessel. The amount of representative test sample with which each container is filled should be as follows: approximately 1,700 cm<sup>3</sup> for the small container, and 4,700 cm<sup>3</sup> for the large container.
  - .2 Mix the sample well and divide into three approximately equal sub-samples, namely (A), (B) and (C). The sub-sample (A) should be immediately weighed and placed in the drying oven to determine the moisture content of the sample "as received".

The sub-samples (B) and (C) are used for the preliminary test and the main test, respectively.

.3 The vibration level of the vibrating table should be calibrated, using an acceleration meter, prior to carrying out testing. The acceleration of the table should be adjusted to  $2g \text{ rms} \pm 10\%$  with a container filled with a sample mounted on the table.

#### 1.2.3.2 Preliminary flow moisture test

This test is intended to measure quickly the approximate flow moisture point, using sub-sample (B). Water is added in increments after every penetration test. When a flow state has been reached, the moisture content of the sample just above the flow state is measured. The moisture content of the sample just below the flow state can be calculated by deducting the increment of water last added from the gross mass of the sample.

- .1 Fill the appropriate cylindrical vessel with sub-sample (B) in four distinct stages and tamp after the addition of each layer using a specified tamper. Tamp to a pressure denoted in 1.1.4.1 for mineral concentrates or to 40 kPa for coals, and apply the pressure evenly over the whole surface area of the material until a uniformly flat surface is obtained.
- .2 Place the penetration bit on the surface of the material through the holder.
- .3 Operate the vibrator at a frequency of 50 Hz or 60 Hz with an acceleration of  $2g \text{ rms} \pm 10\%$  for 6 minutes. If necessary, the acceleration level should be checked by referring to the output of the acceleration meter attached to the vibrating table.
- .4 After 6 minutes of vibration, read the depth of penetration.
- .5 When the depth of penetration is less than 50 mm, it is judged that liquefaction did not take place. Then:

- .1 Remove the material from the cylindrical vessel and replace in the mixing bowl with the remainder of the sample.
- .2 Mix well and weigh the contents of the mixing bowl.
- .3 Sprinkle an increment of water of not more than 1% of the mass of the material in the bowl and mix well.
- .4 Repeat the procedure described in 1.2.3.2.1 to 1.2.3.2.5.
- .6 When the depth of penetration is greater than 50 mm, it is judged that liquefaction took place. Then:
  - .1 Remove the material from the cylindrical vessel and replace in the mixing bowl.
  - .2 Measure the moisture content in accordance with the procedure described in 1.1.4.4.
  - .3 Calculate the moisture content of the sample just below the flow moisture point on the basis of the amount of water added.
- .7 If the penetration depth in the first attempt exceeds 50 mm, i.e., the sample as received liquefied, mix sub-samples (B) and (C) and dry at room temperature to reduce the moisture. Then, divide the material into two sub-samples (B) and (C), and repeat the preliminary test.
- 1.2.3.3 The main flow moisture test
  - .1 On the basis of the preliminary test, the main test should be carried out to determine the flow moisture point more accurately.
  - .2 Adjust the moisture content of the sub-sample (C) to the last value, which did not cause flow in the preliminary flow moisture test.
  - .3 The first test of the main flow moisture test is carried out on this adjusted sample in the same manner as described in 1.2.3.2. In this case, however, the addition of water in increments should not be more than 0.5% of the mass of the test material.
  - .4 When the approximate value of the flow moisture point is known in advance, the moisture content of the sub-sample (C) is adjusted to approximately 90% of this value.
  - .5 When a flow state has been reached, the flow moisture point is determined as described in 1.1.4.3.



Figure D.1.2.2 Test apparatus

Figure 1.2.2.2 *Vibration table* 



SIDE VIEW



Figure 1.2.2.3-1 Cylindrical vessel, 150 mm diameter

SIDE VIEW



PLAN VIEW after dismounting head and body



Figure 1.2.2.3-2 Cylindrical vessel, 200 mm diameter





Figure 1.2.2.4 *Penetration bit* 



Figure 1.2.2.5 Bit holder

#### **1.3** *Proctor/Fagerberg test procedure*

- 1.3.1 *Scope* 
  - .1 Test method for both fine and relatively coarse-grained ore concentrates or similar materials up to a top size of 5 mm. This method should not be used for coal or other porous materials.
  - .2 Before the Proctor/Fagerberg test is applied to coarser materials with a top size greater than 5 mm, an extensive investigation for adoption and improvement is required.
  - .3 The transportable moisture limit (TML) of a cargo is taken as equal to the critical moisture content at 70% degree of saturation according to the Proctor/Fagerberg method test.

#### 1.3.2 Proctor/Fagerberg test equipment

- .1 The Proctor apparatus (see figure 1.3.2) consists of a cylindrical iron mould with a removable extension piece (the compaction cylinder) and a compaction tool guided by a pipe open at its lower end (the compaction hammer).
- .2 Scales and weights (see 3.2) and suitable sample containers.
- .3 A drying oven with a controlled temperature interval from  $100^{\circ}$  C to maximum  $105^{\circ}$ C. This oven should be without air circulation.
- .4 A suitable mixer. Care should be taken to ensure that the use of the mixer does not reduce the particle size or consistency of the test material.
- .5 Equipment to determine the density of the solid material, for example a pycnometer.
- 1.3.3.3 Temperature and humidity (see 1.1.3)

#### 1.3.4 *Procedure*

.1 Establishment of a complete compaction curve. A representative sample according to a relevant standard (see section 4.7, page 20) of the test material is dried at a temperature of approximately  $100^{\circ}$ C. The total quantity of the test material should be at least three times as big as required for the complete test sequence. Compaction tests are executed for five to ten different moisture contents (five to ten separate tests). The samples are adjusted in order that dry to almost saturated (plastic) samples are obtained. The required quantity per compaction test is about 2,000 cm<sup>3</sup>.



Figure D.1.3.2 Proctor apparatus



Figure 1.3.4.2

At each compaction test a suitable amount of water is added to the sample of the dried test material and mixed thoroughly for 5 minutes. Approximately one fifth of the mixed sample is filled into the mould and levelled and then the increment is tamped uniformly over the surface of the increment. Tamping is executed by dropping the hammer 25 times through the guide pipe, 0.2 m each time. The performance is repeated for all five layers. When the last layer has been tamped the extension piece is removed and the sample is levelled off along the brim of the mould. When the weight of the cylinder with the tamped sample has been determined, the cylinder is emptied, the sample is dried and the weight is determined.

The test then is repeated for the other samples with different moisture contents.

- .2 Definitions and data for calculations (see figure 1.3.4.2)
  - empty cylinder, mass in grams: A
  - cylinder with tamped sample, mass in grams: B
  - wet sample, mass in grams: C

$$C = B - A$$

- dry sample, mass in grams: D
- water, mass in grams (equivalent to volume in cm<sup>3</sup>): E

$$E = C - D$$

Volume of cylinder: 1000 cm<sup>3</sup>

- .3 Calculation of main characteristics
  - density of solid material,  $g/cm^3$  ( $t/m^3$ ): d
  - dry bulk density, g/cm<sup>3</sup> (t/m<sup>3</sup>):  $\gamma$

$$\gamma = \frac{D}{1000}$$

- net water content, volume %:  $e_v$ 

$$\mathbf{e}_{\mathbf{v}} = \frac{E}{D} \mathbf{x} \ 100 \mathbf{x} \mathbf{d}$$

- void ratio: e (volume of voids divided by volume of solids)

$$e = \frac{1000 - D}{D} = \frac{d}{\lambda} = -1$$

- degree of saturation, percentage by volume: S

$$S = \frac{e_v}{e}$$

- gross water content, percentage by mass: W<sup>1</sup>

$$W^1 = \frac{E}{C} \ge 100$$

- net water content, percentage by mass: W

$$W = \frac{E}{D} \ge 100$$

.4 *Presentation of the compaction tests* 

For each compaction test the calculated void ratio (e) value is plotted as the ordinate in a diagram with net water content  $(e_v)$  and degree of saturation (S) as the respective abscissa parameters.



Figure 1.3.4.5

## .5 *Compaction curve*

The test sequence results in a specific compaction curve (see figure 1.3.4.5).

The critical moisture content is indicated by the intersection of the compaction curve and the line S = 70% degree of saturation. The transportable moisture limit (TML) is the critical moisture content.

#### 2 Test procedures to determine the angle of repose and associated apparatus

## 2.1 Determination of angle of repose of fine-grained materials (size less than 10 mm): "tilting box test". For use in laboratory or port of loading

#### 2.1.1 *Scope*

The test provides for the determination of the angle of repose of fine-grained non-cohesive materials (size less than 10 mm). The results so obtained may be used when interpreting sections 5 and 6 of this Code for the materials in question.

#### 2.1.2 *Definition*

The angle of repose obtained by this test is the angle formed between the horizontal and the top of the testbox when the material in the box just begins to slide in bulk.

#### 2.1.3 Principle of test

When measuring the angle of repose by this method, the material surface should initially be level and parallel to the testbox base. The box is tilted without vibration and tilted without vibration and tilting is stopped when the product just begins to slide in bulk.

#### 2.1.4 Apparatus (see figure 2.1.4)

Apparatus is as follows:

- .1 A framework, on top of which is attached an open box. Attachment of the box to the frame is by means of a shaft passing through bearings affixed to both the frame and the end of the box, enabling the box to be subjected to a controlled tilt.
- .2 The dimensions of the box are 600 mm long, 400 mm wide and 200 mm high.
- .3 To prevent sliding of the material along the bottom of the box during tilting, a tightly fitting grating (openings 30 mm x 30 mm x 25 mm) is placed on the bottom of the box before filling.
- .4 Tilting of the box is effected by a hydraulic cylinder fitted between the frame and the bottom of the box. Other means may be used to obtain the required tilting but in all cases vibration must be eliminated.
- .5 To pressurize the hydraulic cylinder, a hydropneumatic accumulator may be used, pressurized by air or gas at a pressure of about  $5 \text{ kp/cm}^2$ .
- .6 The rate of tilting should be approximately  $0.3^{\circ}/s$ .
- .7 Range of tilt should be at least  $50^{\circ}$ .



Figure 2.1.4 Basic sketch of tilting box

- .8 A protractor is fitted to the end of the shaft. One lever of the protractor is fitted so that it may be screw-adjusted to the horizontal.
- .9 The protractor should measure the angle of the top of the box to the horizontal to within an accuracy of  $0.5^{\circ}$ .
- .10 A spirit level or some other levelling device should be available to zero the protractor.

## 2.1.5 *Procedure*

The box is filled with the material to be tested by pouring it slowly and carefully from the lowest practical height into the box in order to obtain uniformity of loading.

The excess material is scraped off with the aid of a straight edge, inclined at about 45° towards the direction of scraping.

The tilting system is then activated and stopped when the material just begins to slide in bulk.

The angle of the top of the box to the horizontal is measured by the protractor and recorded.

#### 2.1.6 *Evaluation*

The angle of repose is calculated as the mean of three measurements and is reported to within half a degree.

Notes: Preferably the test should be carried out with three independent samples.

Care should be taken to ensure that the shaft is adjusted to be horizontal before testing.

# 2.2 Alternative or shipboard test method to be used for the determination of the angle of repose when the tilting box is not available

## 2.2.1 *Definition*

According to this method the angle of repose is the angle between the cone slope and the horizontal measured at half height.

## 2.2.2 *Principle of test*

To determine the angle of repose, a quantity of the material to be tested is poured very carefully out of a flask onto a sheet of rough-textured paper, in such a way that a symmetrical cone is formed.

#### 2.2.3 Equipment

The necessary equipment to carry out this test is as follows:

- a horizontal table free from vibrations;
- a sheet of rough-textured paper onto which the material should be poured;
- a protractor; and
- a 3-litre conical flask.
# 2.2.4 *Procedure*

Put the sheet of paper on the table. Split 10*l* of the material to be tested into three sub-samples and test each in the following way:

Pour two thirds of the sub-sample (i.e., 2 l) onto the sheet, producing a starting cone. The remainder of this sub-sample is then poured very carefully from a height of a few millimetres on top of the cone. Care should be taken that the cone will be built up symmetrically. This may be achieved by revolving the flask slowly close around the top of the cone when pouring.

When measuring, care should be taken that the protractor does not touch the cone; otherwise this may result in sliding of the material and spoil the test.

The angle has to be measured at four places around the cone, about 90 degrees apart.

This test should be repeated on the other two sub-samples.

# 2.2.5 *Calculations*

The angle of repose is taken as the mean of the 12 measurements and is reported to half a degree. This figure can be converted to the tilting box value as follows:

 $a_t = a_{s+} 3^{\circ}$  (2.2.5)

Where  $a_t$  = angle of repose according to the tilting box text

 $a_s$  = angle of repose according to the survey test

## **3** Standards used in test procedures

# 3.1 Standard flow table and frame<sup>\*</sup>

## 3.1.1 *Flow table and frame*

3.1.1.1 The flow table apparatus shall be constructed in accordance with figure 3. The apparatus shall consist of an integrally cast rigid iron frame and a circular rigid table top, 10 inches  $\pm$  0.1 inch (254 mm  $\pm$  2.5 mm) in diameter, with a shaft attached perpendicular to the table top by means of a screw thread. The table top, to which the shaft with its integral contact shoulder is attached, shall be mounted on a frame in such a manner that it can be raised and dropped vertically through the specified height, with a tolerance in height of  $\pm$  0.005 inches (0.13 mm) for new tables and  $\pm$  0.015 inches (0.39 mm) for tables in use, by means of a rotated cam. The table top shall have a fine-machined plane surface, free of blowholes and surface defects, and shall be scribed as shown in figure 3. The table top shall be of cast brass or bronze having a Rockwell hardness number not less than HRB 25 with an edge thickness of 0.3 inches (8 mm), and shall have six integral radial stiffening ribs. The table top and attached

<sup>\*</sup> Source: "Standard Specification for Flow Table for Use in Tests of Hydraulic Cement", Designation C230-68. Reprinted by permission of American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, Penn., USA, copyright ASTM 1977.

shaft shall weigh 9 lb  $\pm$  0.1 lb (4 kg  $\pm$  0.05 kg) and the weight shall be symmetrical around the centre of the shaft.

3.1.1.2 The cam and vertical shaft shall be of medium-carbon machinery steel, hardened where indicated in figure 3. The shaft shall be straight and the difference between the diameter of the shaft and the diameter of the bore of the frame shall be not less than 0.002 inches (0.05) and not more than 0.003 inches (0.08 mm) for new tables and shall be maintained at from 0.002 inches to 0.010 inches (0.26 mm) for tables in use. The end of the shaft shall not fall upon the cam at the end of the drop, but shall make contact with the cam not less than 120° from the point of drop. The face of the cam shall be a smooth spiralled curve of uniformly increasing radius from  $\frac{1}{2}$  inch to  $\frac{1}{4}$  inches (13 mm to 32 mm) in 360° and there shall be no appreciable jar as the shaft comes into contact with the cam. The cam shall be so located and the contact faces of the cam and shaft shall be such that the table does not rotate more than one revolution in 25 drops. The surfaces of the frame and of the table which come into contact at the end of the drop shall be maintained smooth, plane, and horizontal and parallel with the upper surface of the table and shall make continuous contact over a full 360°.

3.1.1.3 The supporting frame of the flow table shall be integrally cast of fine-grained, high-grade cast iron. The frame casting shall have three integral stiffening ribs extending the full height of the frame and located  $120^{\circ}$  apart. The top of the frame shall be chilled to a depth of approximately  $\frac{1}{4}$  inch (6.4 mm) and the face shall be ground and lapped square with the bore to give  $360^{\circ}$  contact with the shaft shoulder. The underside of the base of the frame shall be ground to secure a complete contact with the steel plate beneath.

3.1.1.4 The flow table may be driven by a motor,<sup>1</sup> connected to the camshaft through an enclosed worm gear speed reducer and flexible coupling. The speed of the camshaft shall be approximately 100 rpm. The motor drive mechanism shall not be fastened or mounted on the table base plate or frame.

The performance of a flow table shall be considered satisfactory if, in calibration tests, the table gives a flow value that does not differ by more than 5 percentage points from flow values obtained with a suitable calibration material.<sup>2</sup>

## 3.1.2 *Flow table mounting*

3.1.2.1 The flow table frame shall be tightly bolted to a cast iron or steel plate at least 1 inch (25 mm) thick and 10 inches (250 mm) square. The top surface of this plate shall be machined to a smooth plane surface. The plate shall be anchored to the top of a concrete pedestal by four  $\frac{1}{2}$  inch (13 mm) bolts that pass through the plate and are embedded at least 6 inches (150 mm) in the pedestal. The pedestal shall be cast inverted on the base plate. A positive contact between the base plate and the pedestal shall be obtained at all points. No nuts or other such levelling devices shall be used between the plate and the pedestal. Levelling shall be effected by suitable means under the base of the pedestal.

<sup>&</sup>lt;sup>1</sup> A 1/20 hp (40 W) motor has been found adequate. The flow table may be driven by a hand-operated camshaft as shown in the illustration.

<sup>&</sup>lt;sup>2</sup> Such a material may be obtained from the Cement and Concrete Reference Laboratory at the National Bureau of Standards, Washington, D.C. 20234, USA.

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Figure 3

3.1.2.2 The pedestal shall be 10 inches to 11 inches (250 mm to 275 mm) square at the top, and 15 inches to 16 inches (375 mm to 400 mm) square at the bottom, 25 inches to 30 inches (625 mm to 750 mm) in height, and shall be of monolithic construction, cast from concrete weighing at least 140 lb/ft<sup>3</sup> (2240 kg/m<sup>3</sup>). A stable gasket cork pad,  $\frac{1}{2}$  inch (13 mm) thick and approximately 4 inches (102 mm) square, shall be inserted under each corner of the pedestal. The flow table shall be checked frequently for levelness of the table top, stability of the pedestal, and tightness of the bolts and nuts in the table base and the pedestal plate. (A torque of 20 lb ft (27 Nm) is recommended when tightening those fastenings.)

3.1.2.3 The table top, after the frame has been mounted on the pedestal, shall be level along two diameters at right angles to each other, in both the raised and lowered positions.

## 3.1.3 *Flow table lubrication*

3.1.3.1 The vertical shaft of the table shall be kept clean and shall be lightly lubricated with a light oil (SAE-10). Oil shall not be present between the contact faces of the table top and the supporting frame. Oil on the cam face will lessen wear and promote smoothness of operation. The table should be raised and permitted to drop a dozen or more times just prior to use if it has not been operated for some time.

# 3.1.4 *Mould*

3.1.4.1 The mould for casting the flow specimen shall be of cast bronze or brass, constructed as shown in figure 3. The Rockwell hardness number of the metal shall be not less than HRB 25. The diameter of the top opening shall be 2.75 inches + 0.02 inches (69.8 mm + 0.5 mm) for new moulds and 2.75 inches + 0.05 inches (+ 1.3 mm) and - 0.02 inches for moulds in use. The surfaces of the base and top shall be parallel and at right angles to the vertical axis of the cone. The mould shall have a minimum wall thickness of 0.2 inches (5 mm). The outside of the top edge of the mould shall be shaped so as to provide an integral collar for convenient lifting of the mould. All surfaces shall be machined to a smooth finish. A circular shield approximately 10 inches (254 mm) with in diameter, а centre opening approximately 4 inches (102 mm) in diameter, made of non-absorbing material not attacked by the cement, shall be used with the flow mould to prevent mortar from spilling on the table top.

# 3.2 Scales and weights<sup>\*</sup>

## 3.2.1 *Scales*

3.2.1.1 The scales used shall conform to the following requirements. On scales in use, the permissible variation at a load of 2000 g shall be  $\pm$  2.0 g. The permissible variation on new scales shall be one half of this value. The sensibility reciprocal<sup>\*\*</sup> shall be not greater than twice the permissible variation.

<sup>\*</sup> Source, "Standard Method of Test for Compressive Strength of Hydraulic Cement Mortars", Designation C109-3. Reprinted by permission of American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, Penn., USA, copyright ASTM 1977.

<sup>\*\*</sup> Generally defined, the sensibility reciprocal is the change in load required to change the position of rest of the indicating element or elements of a non-automatic indicating scale a definite amount at any load. For a more complete definition, see "Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices", *Handbook H44*, National Bureau of Standards, Washington, D.C., USA, September 1949, pp. 92 and 93.

#### 3.2.2 Weights

3.2.2.1 The permissible variations on weights shall be as prescribed in the table below. The permissible variations on news weights shall be one half of the values in the table below.

#### PERMISSIBLE VARIATIONS ON WEIGHTS

Weight (g)

Permissible variations on weights in use, plus or minus (g)

1000	 0.50
900	 0.45
750	 0.40
500	 0.35
300	 0.30
250	 0.25
200	 0.20
100	 0.15
50	 0.10
20	 0.05
10	 0.04
5	 0.03
2	 0.02
1	 0.01

# 4 Trough test for determination of the self-sustaining exothermic decomposition of fertilizers containing nitrates<sup>\*</sup>

#### 4.1 *Definition*

A fertilizer capable of self-sustaining decomposition is defined as one in which decomposition initiated in a localized area will spread throughout the mass. The tendency of a fertilizer offered for transport to undergo this type of decomposition can be determined by means of the trough test. In this test localized decomposition is initiated in a bed of the fertilizer to be contained in a horizontally mounted trough. The amount of propagation, after removal of the initiating heat source, of decomposition through the mass is measured.



Figure 4-1 Gauze trough with support and burners

<sup>\*</sup> Source: Section 38 of the United Nations Recommendation on the Transport of Dangerous Goods, Manual of Tests and Criteria.

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#### 4.2 Apparatus and materials

The apparatus (figure 4-1) consists of a trough of internal dimensions 150 mm x 150 mm x 500 mm, open at the top. The trough is constructed of square-meshed gauze (preferably stainless steel) with a mesh width of about 1.5 mm and a wire thickness of 1.0 mm supported on a frame made from, for example, 15 mm wide, 2 mm thick steel bars. The gauze at each end of the trough may be replaced by 1.5 mm thick, 150 mm x 150 mm stainless steel plates. The trough should be rested on a suitable support. Fertilizers with a particle size distribution such that a significant amount falls through the mesh of the trough should be tested in a trough of smaller mesh gauze, or alternatively in a trough lined with gauze of a smaller mesh. During initiation sufficient heat should be provided and maintained to establish a uniform decomposition front. Two alternative heating methods are recommended, *viz*:



A Aluminium or stainless steel sheathing (thickness 3 mm)

B Insulating plate (thickness 5 mm)

C Aluminium foil or stainless steel plate (thickness 3 mm)

D Position of heating device in trough

## Figure 4-2 Electrical heating device (capacity 250 W)

#### 4.2.1 *Electrical heating*

An electrical heating element (capacity 250 W) enclosed in a stainless steel box is placed inside and at one end of the trough (figure 4-2). The dimensions of the stainless steel box are 145 mm x 145 mm x 10 mm, and the wall thickness is 3 mm. The side of the box which is not in contact with the fertilizer should be protected with a heat shield (insulation plate 5 mm thick). The heating side of the box may be protected with aluminium foil or a stainless steel plate.

## 4.2.2 *Gas burners*

A steel plate (thickness 1 mm to 3 mm) is placed inside one end of the trough and in contact with the wire gauze (figure 4-1). The plate is heated by means of two burners which are fixed to the trough support and are capable of maintaining the plate at temperatures between  $400^{\circ}$ C and  $600^{\circ}$ C, i.e., dull red heat.

4.2.3 To prevent heat transport along the outside of the trough, a heat shield consisting of a steel plate (2 mm thick) should be installed at about 50 mm from the end of the trough where the heating takes place.

4.2.4 The life of the apparatus may be prolonged if it is constructed of stainless steel throughout. This is particularly important in the case of the gauze trough.

4.2.5 Propagation may be measured using thermocouples in the substance and recording the time at which a sudden temperature rise occurs as the reaction front reaches the thermocouple.

## 4.3 *Procedure*

4.3.1 The apparatus should be set up under a fume hood to remove toxic decomposition gases or in an open area where the fumes can be readily dispersed. Although there is no explosion risk, when performing the test it is advisable to have a protective shield, e.g., of suitable transparent plastics, between the observer and the apparatus.

4.3.2 The trough is filled with the fertilizer in the form to be offered for shipment and decomposition is initiated at one end, either electrically or by means of gas burners as described above. Heating should be continued until decomposition of the fertilizer is well established and propagation of the front (over approximately 30 mm to 50 mm) has been observed. In the case of products with high thermal stability, it may be necessary to continue heating for two hours. If fertilizers show a tendency to melt, the heating should be done with care, i.e., using a small flame.

4.3.3 About 20 minutes after the heating has been discontinued, the position of the decomposition front is noted. The position of the reaction front can be determined by difference in colour, e.g., brown (undecomposed fertilizer) to white (decomposed fertilizer), or by the temperature indicated by adjacent pairs of thermocouples which bracket the reaction front. The rate of propagation may be determined by observation and timing or from thermocouple records. It should be noted whether there is no propagation after heating is discontinued or whether propagation occurs throughout the substance.

## 4.4 Test criteria and method of assessing results

4.4.1 If propagation of the decomposition continues throughout the substance the fertilizer is considered capable of showing self-sustaining decomposition.

4.4.2 If propagation does not continue throughout the substance, the fertilizer is considered to be free from the hazard of self-sustaining decomposition.

# 5 Description of the Test of Resistance to Detonation

#### 5.1 *Principle*

5.1.1 The test sample is confined in a steel tube and subjected to detonation shock from an explosive booster charge. Propagation of the detonation is determined from the degree of compression of lead cylinders on which the tube rests horizontally during the test.

## 5.2 Sample Preparation

5.2.1 The test must be carried out on a representative sample of cargo. Before being tested for resistance to detonation, the whole mass of the sample is to be thermally cycled five times between 25°C and 50°C ( $\pm$  1°C) in sealed tubes. The sample shall be maintained at the extreme temperatures, measured at the centre of the sample, for at least 1 hour during each thermal cycle and at 20°C ( $\pm$  3°C) after complete cycling until tested.

## 5.3 *Materials*

Seamless steel tube to ISO 65-1981-Heavy or equivalent

Tube length	1,000 mm
Nominal external diameter	114 mm
Nominal wall thickness	5 to 6.5 mm

Bottom plate (160 x 160 mm) of good weldable quality, thickness 5 to 6 mm to be butt-welded to one end of the tube around the entire circumference.

Initiation system and booster

Electrical blasting cap or detonating cord with non-metallic sleeve (10 to 13 g/m).

Compressed pellet of secondary explosive, such as hexogen/wax 95/5 or tetryl, with a central recess to take the detonator.

 $500 \pm 1$  gramme plastic explosive containing 83 to 86 % penthrite, formed into a cylinder in a cardboard or plastic tube. Detonation velocity 7,300 to 7,700 m/s.

Six witness cylinders of refined, cast lead for detecting detonation

50 mm diameter x 100 mm high, refined lead of at least 99.5% purity.

## 5.4 *Procedure*

Test Temperature: 15 to 20°C. Figures 1 and 2 show the test arrangement.

Fill the tube about one-third of its height with the test sample and drop it 10 cm vertically five times on the floor. Improve the compression by striking the side wall with a hammer between drops. A further addition shall be made such that, after compaction or by raising and dropping the tube 20 times and a total of 20 intermittent hammer blows, the charge fills the tube to a distance of 70 mm from its orifice.

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Insert the plastic explosive into the tube and press it down with a wooden die. Place the compressed pallet centrally in the recess within the plastic explosive. Close it with a wooden disc so that it remains in contact with the test sample. Lay the test tube horizontally on the 6 lead cylinders placed at 150 mm intervals (centric), with the centre of the last cylinder 75 mm from the bottom plate, on a firm, level, solid surface that is resistant to deformation or displacement. Insert the electrical blasting cap or the detonating cord.

Ensure that all necessary safety precautions are taken, connect and detonate the explosive.

Record, for each of the lead cylinders, the degree of compression expressed as a percentage of the original height of 100 mm. For oblique compression, the deformation is taken as the average of the maximum and minimum deformation.

#### 5.5 *Results*

The test is to be carried out twice. If in each test one or more of the supporting lead cylinders are crushed by less than 5%, the sample is deemed to satisfy the resistance to detonation requirements.

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#### Dimensions in mm

1	Steel tube	6	Compressed pellet
2	Wooden disc	Ø	Test sample
3	Plastic or cardboard cylinder	8	4-mm diameter hole drilled to receive split pin (9)
4	Wooden rod	9	Split pin
5	Plastic explosive	10	Wooden die for (5) diameter as for detonator

# Figure 1: Booster charge



dimensions in mm

Figure 2: Positioning of the steel tube on the firing site

#### 6 Self-heating test for charcoal

#### 6.1 Apparatus

6.1.1 *Oven*. A laboratory oven fitted with internal air circulation and capable of being controlled at  $140^{\circ}C \pm 2^{\circ}C$ .

6.1.2 *Wire mesh cube*. Construct an open-top cube, 100 mm side, from phosphor bronze gauze 18.000 mesh per square centimetre ( $350 \times 350$  mesh). Insert it inside a slightly larger, well-fitting cube, made of phosphor bronze gauze 11 mesh per square centimetre ( $8 \times 8$  mesh). Fit the outer cube with a handle or hooks so that it can be suspended from above.

6.1.3 *Temperature measurement*. A suitable system to measure and record the temperature of the oven and in the centre of the cube. "Chromel-alumel" thermocouples, made from 0.27 mm diameter wire, are suitable for measuring the temperature range expected.

#### 6.2 *Procedure*

6.2.1 Fill the cube with carbon and tap down gently, adding carbon until the cube is full. Suspend the sample in the centre of the oven which has been preheated to  $140^{\circ}C \pm 2^{\circ}C$ . Insert one of the thermocouples in the centre of the sample and the other between the cube and the oven wall. Maintain the temperature of the oven at  $140^{\circ}C \pm 2^{\circ}C$  for 12 hours and record the oven temperature and the sample temperature.

#### 6.3 *Results*

6.3.1 Non-activated carbon, non-activated charcoal, carbon black and lamp black fail the test if the temperature at any time during the 12 hours exceeded 200°C.

6.3.2 Activated carbon and activated charcoal fail the test if the temperature at any time during the 12 hours exceeded  $400^{\circ}$ C.

# **APPENDIX 3**

#### **PROPERTIES OF DRY BULK CARGOES**

#### **1** Non-cohesive cargoes

1.1 The following cargoes are non-cohesive when dry:

AMMONIUM NITRATE AMMONIUM NITRATE BASED FERTILIZERS (TYPE A, TYPE B and NON-HAZARDOUS) AMMONIUM SULPHATE BORAX, anhydrous CALCIUM NITRATE FERTILIZER CASTOR BEANS DIAMMONIUM PHOSPHATE MONOAMMONIUM PHOSPHATE POTASSIUM CHLORIDE POTASH POTASSIUM NITRATE POTASSIUM SULPHATE SODIUM NITRATE SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE **SUPERPHOSPHATE UREA** 

1.2 Prior to completion of loading, the angle of repose of the materials to be loaded should be determined (see section 6) so as to determine which provisions of this Code relating to trimming apply (see section 5).

1.3 All cargoes, other than those listed in this appendix, are cohesive and the use of the angle of repose is, therefore, not appropriate. Cargoes not listed should be treated as cohesive until otherwise shown.

#### 2 Cargoes which may liquefy

2.1 Many fine-particled cargoes if possessing a sufficiently high moisture content are liable to flow. Thus any damp or wet cargo containing a proportion of fine particles should be tested for flow characteristics prior to loading.

#### **3** Precautions for the cargoes which may possess a chemical hazard

3.1 In circumstances where consultation with the competent authority is required prior to shipment of dry bulk cargoes, it is equally important to consult authorities at the port of loading and discharge concerning requirements which may be in force.

3.2 Where required, the Medical First Guide for Use in Accidents Involving Dangerous Goods (MFAG) should be consulted prior to loading.

# **APPENDIX 4**

# INDEX

BULK CARGO SHIPPING NAME	GROUP	REFERENCES
ALFALFA	С	
ALUMINA	С	
ALUMINA, CALCINED	С	
ALUMINA, SILICA	С	
ALUMINA SILICA, pellets	С	
ALUMINIUM FERROSILICON POWDER	B	
UN 1395		
ALUMINIUM NITRATE UN 1438	В	
ALUMINIUM REMELTING BY-PRODUCTS	В	see ALUMINIUM SMELTING
UN 3170		BY-PRODUCTS
ALUMINIUM SILICON POWDER.	В	
UNCOATED UN 1398	_	
ALUMINIUM SMELTING BY-PRODUCTS	В	
UN 3170	-	
AMMONIUM NITRATE UN 1942	В	
AMMONIUM NITRATE BASED FERTILIZER	B	
(Type A) UN 2067	D	
AMMONIUM NITRATE BASED FERTILIZER	В	
(Type B) UN 2071	-	
AMMONIUM NITRATE, BASED FERTILIZER	С	
(non-hazardous)	C	
AMMONIUM SULPHATE	С	
ANTIMONY ORE AND RESIDUE	C	
Antimony ore residue	C	see ANTIMONY ORE AND RESIDUE
Bakery materials	B or C	see SEED CAKE
BARIUM NITRATE UN 1446	B	
Barley malt pellets	B or C	see SEED CAKE
BARYTES	C	
BAUXITE	C	
Beet expelled or extracted	B or C	see SEED CAKE
BIOSLUDGE	C	
Blende (zinc sulphide)	A	see ZINC CONCENTRATE
BORAX, ANHYDROUS, crude	C	
BORAX ANHYDROUS refined	C	
BORAX (PENTAHYDRATE CRUDE)	C	
Bran nellets	BorC	see SEED CAKE
Brewer's grain nellets	BorC	see SEED CAKE
BROWN COAL BRIOLETTES	B	
Calcined clay	C	see ALUMINA CALCINED
Calcined pyrites	A and B	see PVRITES CALCINED
Calcium fluoride	B	See FLUORSPAR
CALCIUM NITRATE UN 1454	B	See I LOOKSI AK
CALCIUM NITRATE FERTILIZER		
Calcium ovide	R R	see LIME (LINSLAKED)
Canola Dellets	BorC	See SEED CAKE
		SUCSEED CARE
CASTOD DEANS LIN 2040	D D	
CASTOR DEANS UN 2909	D	

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BULK CARGO SHIPPING NAME	GROUP	REFERENCES
CASTOR FLAKE UN 2969	В	
CASTOR MEAL UN 2969	B	
CASTOR POMACE UN 2969	В	
CEMENT	С	
CEMENT CLINKERS	С	
CEMENT COPPER	А	see Mineral Concentrates
Chalcopyrite	А	see COPPER CONCENTRATE
CHAMOTTE	С	
CHARCOAL	В	
CHOPPED RUBBER AND PLASTIC	С	
INSULATION		
Chile saltpetre	В	see SODIUM NITRATE
Chilean natural nitrate	В	see SODIUM NITRATE
Chilean natural potassic nitrate	В	see SODIUM NITRATE AND
		POTASSIUM NITRATE MIXTURE
Chrome ore	С	see CHROMITE ORE
CHROME PELLETS	С	
CHROMITE ORE	С	
Chromium ore	С	see CHROMITE ORE
Citrus pulp pellets	B or C	see SEED CAKE
CLAY	С	
COAL	A and B	
COAL SLURRY	A	
COARSE CHOPPED TYRES	С	
Coconut	B or C	see SEED CAKE
COKE	C	
COKE BREEZE	A	
COLEMANITE	C	
COPPER CONCENTRATE	A	see Mineral Concentrates
COPPER GRANULES	C	
	<u> </u>	NICKEL CONCENTRATE
Copper nickel	A	See NICKEL CONCENTRATE
Copper ore concentrate	A	See COPPER CONCENTRATE
Copper precipitate	A	SEE CEMENT COPPER
COPPA (dr.) LIN 1262	BorC	see SEED CAKE
COPRA (dry) UN 1303	B D or C	COLOR SEED CAKE
Cotton good expellers	B or C	see SEED CAKE
		See SEED CAKE
Deadburned magnesite		SAA MAGNESIA (DEADBURNED)
DIA MMONIUM PHOSPHATE		see MAGNESIA (DEADBORNED)
DIRECT REDUCED IRON (A)	B	
(Priquettes, hot moulded)	Б	
DIPECT PEDI CED IPON (P)	B	
DIRECT REDUCED IRON, (D)	Б	
DOLOMITE	C	
Dolomitic quicklime		SEE LIME (LINICLAVED)
	D	DIDECT DEDUCED ID ON
D.K.I.	В	see DIRECT REDUCED IRON A or B
FELSPAR LUMP	С	

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FERROCHROMECFERROMANGANESECFERROMANGANESECFerromanganese, exothermicCsee FERROMANGANESECFERRONICKELCFERROPHOSPHORUSBFerROSILCON UN 1408BFERROPHOSPHORUSBFERRONICK UN 1408BFERROUS METAL BORINGS UN 2793BFERROUS METAL CUTTINGS UN 2793BFERROUS METAL SHAVINGS UN 2793BFERROUS METAL UNNINGS UN 2793BFERROUS METAL SHAVINGS UN 2793BFERROUS METAL UNNINGS UN 2793BFERROUS METAL UNATIONS UN 2793BFERROUS METAL DUN 1276BGalena (lead sulphide)ASee Mineral ConcentratesGround nuts, mealB or CGround nuts, mealB or CGround nuts, mealB or CIDON CONCENTRATEA	BULK CARGO SHIPPING NAME	GROUP	REFERENCES
FERROCHROME, exothermicCFERROMANGANESECFERROMANGANESECFerromanganese, exothermicCSee FERROMANGANESEFERRONICKELCFERROPHOSPHORUSBFerrophosphorus briquettesBSee FERROPHOSPHORUSBFERROUS METAL BORINGS UN 2793BFERROUS METAL CUTTINGS UN 2793BFERROUS METAL CUTTINGS UN 2793BFERROUS METAL TURNINGS UN 2216BFISH (IN BULK)AFUORSPARA and BFLUORSPARA and BFLUORSPARCGarbage tankageB or CGarbage tankageB or CGround nuts, mealB or CGround nuts, mealB or CGround nuts, mealB or CGround nuts, mealB or CIMENITE CLAYAILMENITE CLAYAILMENITE CLAYAINO CONCENTRATEA see Mineral ConcentratesIRON CONCENTRATEA see RION CONCENTRATEIRON ORECIR	FERROCHROME	С	
FERROMANGANESECFerromanganese, exothermicCFerromanganese, exothermicCFERROPHOSPHORUSBFERROPHOSPHORUSBFerrophosphorus briquettesBSee FERROPHOSPHORUSBFERROUS METAL BORINGS UN 2793BFERROUS METAL CUTTINGS UN 2793BFERROUS METAL LOUTNINGS UN 2793BFERROUS METAL LURNINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFERROUS METAL SHAVINGS UN 2793BFERROUS METAL TURNINGS UN 2793AFERROUS METAL TURNINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFUORSPARAFUORSPARAFLUORSPARAStatumer and the statumer and the	FERROCHROME, exothermic	С	
Ferromanganese, exothermicCsee FERROMANGANESEFERROPHOSPHORUSBFERROPHOSPHORUSBFerrophosphorus briquettesBFerROSILICON UN 1408BFERROUS METAL BORINGS UN 2793BFERROUS METAL CUTTINGS UN 2793BFERROUS METAL CUTTINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFERTULZERS WITHOUT NITRATESCFISH (IN BULK)AFISHSCRAP, STABILIZED UN 2216BFLUORSPARA and BFLVORSPARA and BFLVORSPARA and BFLUORSPARBGalena (lead sulphide)AGarbage tankageBGRANULATED SLAGCGround nuts, mealB or CGround nuts, mealB or CGround nuts, mealB or CGYPSUMCHominy chopB or CILMENITE SANDCILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATEAIRON CONCENTRATEAIron ore (concentrate, pellet feed, sinter feed)AIRON ORECIron ore (concentrate, pellet feed, sinter feed)AIRON ONCENTRATEBIRON ONCENTRATECIRON ONCENTRATECIRON ONCENTRATECIRON ORE PELLETSCIRON ORE PELLETSCIRON ORE P	FERROMANGANESE	С	
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Ferrophosphorus briquettesBsee FERROPHOSPHORUSFERROSILICON UN 1408BFERROUS METAL BORINGS UN 2793BFERROUS METAL CUTTINGS UN 2793BFERROUS METAL CUTTINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFERTULZERS WITHOUT NITRATESCFISH (IN BULK)AFISHINEAL, STABILIZED UN 2216BFLVASHCGalena (lead sulphide)AGalena (lead sulphide)AGalena (lead sulphide)B or CGakena (lead sulphide)B or CGround nuts, mealB or CGround nuts, mealB or CGyPSUMCHominy chopB or CILMENITE CLAYAILMENITE CLAYAILMENITE CLAYAIRON CONCENTRATEAIRON CONCENTRATEAIRON CONCENTRATEAIRON CONCENTRATECIRON CONCENTRATEAIRON ORECIRON ORECIRON ORECIRON ORECIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON OXIDE, SPENT UN 1376BIRON OXIDE, SPENT UN 1376BIRON SWARFBSee FERROUS METAL BORINGS, SHAVINGS ORCUTTINGSC	FERROPHOSPHORUS	В	
FERROSILICON UN 1408BFERROUS METAL BORINGS UN 2793BFERROUS METAL CUTTINGS UN 2793BFERROUS METAL SHAVINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFERROUS METAL STABILIZED UN 2216BFISHMEAL, STABILIZED UN 2216BFLY ASHCGalena (lead sulphide)AGarbage tankageBGuten pelletsB or CGRANULATED SLAGCGround nuts, mealB or CGround nuts, mealB or CGround nuts, mealB or CILMENITE CLAYAILMENITE SANDCILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATE (pellet feed, sinter feed)AIRON ORECIRON ORECIRON ORECIRON ORECIRON ORECIRON ORE PELLETSCIRON ORE PELLETSCIRON ONE PELLETSCIRON ORE PELLETSC<	Ferrophosphorus briquettes	В	see FERROPHOSPHORUS
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FERROUS METAL CUTTINGS UN 2793BFERROUS METAL SHAVINGS UN 2793BFERROUS METAL TURNINGS UN 2793BFERTILIZERS WITHOUT NITRATESCFISH (IN BULK)AFISHMEAL, STABILIZED UN 2216BFISHSCRAP, STABILIZED UN 2216BFLUORSPARA and BFLY ASHCGalena (lead sulphide)Asee LEAD CONCENTRATEGarbage tankageB or CGRANULATED SLAGCGRANULATED TYRE RUBBERCGround nuts, mealB or CGYPSUMCHominy chopB or CILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATEAIRON CONCENTRATEAIRON ORECIRON ORECIRON ORECIRON ORE PELLETSCIRON ORE PELLETSCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON ORE PELLETSCIRON ORE PELLETSCIRON ORE PELLETSCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON ORE PELLETSCIRON ORE PELLETSCIRON ORE PELLETSCIRON ORE PELLETSCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON PRITES<	FERROUS METAL BORINGS UN 2793	В	
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FERROUS METAL TURNINGS UN 2793BFERTILIZERS WITHOUT NITRATESCFISH (IN BULK)AFISHBEAL, STABILIZED UN 2216BFISHSCRAP, STABILIZED UN 2216BFLUORSPARA and BFLY ASHCGalena (lead sulphide)Asee LEAD CONCENTRATEGarbage tankageB or CGarbage tankageB or CGarbage tankageB or CGarbage tankageB or CGround nuts, mealB or CGYPSUMCHominy chopB or CILMENITE CLAYAILMENITE CLAYAIRON CONCENTRATEAIRON CONCENTRATEAIRON CONCENTRATEAIRON CONCENTRATEAIRON ONCENTRATEAIRON ORECIron disulphideCIRON ORECIRON ORECIRON ORE PELLETSCIRON ORE PELLETSCIRON ORE PELLETSCIRON ORIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	FERROUS METAL SHAVINGS UN 2793	В	
FERTILIZERS WITHOUT NITRATESCFISH (IN BULK)AFISHMEAL, STABILIZED UN 2216BFISHSCRAP, STABILIZED UN 2216BFLUORSPARA and BFLY ASHCGalena (lead sulphide)AGarbage tankageBGarbage tankageBGarbage tankageBGarbage tankageBGarbage tankageB or CGrandultar D SLAGCGRANULATED SLAGCGround nuts, mealB or CGround nuts, mealB or CGround nuts, mealB or CILMENITE CLAYAILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATEAIRON ORECIron disulphideCIRON ORECIRON ORECIRON ORECIRON ORE PELLETSCIRON ORE PELLETSC <td< td=""><td>FERROUS METAL TURNINGS UN 2793</td><td>В</td><td></td></td<>	FERROUS METAL TURNINGS UN 2793	В	
FISH (IN BULK)AFISHMEAL, STABILIZED UN 2216BFISHSCRAP, STABILIZED UN 2216BFLUORSPARA and BFLY ASHCGalena (lead sulphide)AGarbage tankageBGarbage tankageBGaluen pelletsB or CGRANULATED SLAGCGround nuts, mealB or CGround nuts, mealB or CGYPSUMCHominy chopB or CILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATEAIRON CONCENTRATEAIRON ONCENTRATEAIRON ONCENTRATEAIRON ONECIRON ORECIRON ORECIRON ORECIRON ORE PELLETSCIRON ONTIDE, SPENT UN 1376BIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIRON PYRITESC <t< td=""><td>FERTILIZERS WITHOUT NITRATES</td><td>С</td><td></td></t<>	FERTILIZERS WITHOUT NITRATES	С	
FISHMEAL, STABILIZED UN 2216BFISHSCRAP, STABILIZED UN 2216BFLUORSPARA and BFLY ASHCGalena (lead sulphide)Asee LEAD CONCENTRATEGarbage tankageBGutten pelletsB or CGRANULATED SLAGCGround nuts, mealB or CGYPSUMCHominy chopB or CILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATEAIRON ONCENTRATEAIRON ONCENTRATEAIRON ORECIron disulphideCIRON ORECIRON ORE PELLETSCIRON ONZIDE, SPENT UN 1376BIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON PYRITESCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS ORCUTTINGSC	FISH (IN BULK)	Α	
FISHSCRAP, STABILIZED UN 2216BFLUORSPARA and BFLY ASHCGalena (lead sulphide)ASee LEAD CONCENTRATEGarbage tankageBGluten pelletsB or CGRANULATED SLAGCGround nuts, mealB or CGround nuts, mealB or CGYPSUMCHominy chopB or CILMENITE CLAYAIRON CONCENTRATEAIRON CONCENTRATEAIRON ONCENTRATECIron disulphideCIron ore (concentrate, pellet feed, sinter feed)AIRON ORECIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIRON PYRITESC	FISHMEAL, STABILIZED UN 2216	В	
FLUORSPARA and BFLY ASHCGalena (lead sulphide)ASee LEAD CONCENTRATEGarbage tankageBGarbage tankageBGuten pelletsB or CGRANULATED SLAGCGRANULATED TYRE RUBBERCGround nuts, mealB or CSee SEED CAKEGYPSUMCHominy chopB or CILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATE (pellet feed, sinter feed)AIron disulphideCIron ore (concentrate, pellet feed, sinter feed)AIRON ORECIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSteaverCIron swarfBSteaverStarVinGS, TURNINGS ORCUTTINGSC	FISHSCRAP, STABILIZED UN 2216	В	
FLY ASHCGalena (lead sulphide)Asee LEAD CONCENTRATEGarbage tankageBsee TANKAGEGluten pelletsB or Csee SEED CAKEGRANULATED SLAGCGRANULATED TYRE RUBBERGround nuts, mealB or Csee SEED CAKEGYPSUMCHominy chopHominy chopB or Csee SEED CAKEILMENITE CLAYAILMENITE SANDILMENITE SANDCIRON CONCENTRATEIRON CONCENTRATE (pellet feed, sinter feed)Asee Mineral ConcentratesIron disulphideCsee PYRITEIRON ORECIRON CONCENTRATE (pellet feed, sinter feed)IRON ORECsee IRON CONCENTRATEIRON ORECIRON CONCENTRATEIRON ORECsee IRON CONCENTRATE (pellet feed, sinter feed)IRON ORE PELLETSCIRON ONCENTRATE (pellet feed, sinter feed)IRON OXIDE, SPENT UN 1376Bsee FERROUS METAL BORINGS, SHAVINGS NETAL BORINGS	FLUORSPAR	A and B	
Galena (lead sulphide)Asee LEAD CONCENTRATEGarbage tankageBsee TANKAGEGluten pelletsB or Csee SEED CAKEGRANULATED SLAGCGRANULATED TYRE RUBBERGround nuts, mealB or Csee SEED CAKEGYPSUMCHominy chopHominy chopB or Csee SEED CAKEILMENITE CLAYAIIIMENITE SANDIRON CONCENTRATEAsee Mineral ConcentratesIRON CONCENTRATE (pellet feed, sinter feed)Asee Mineral ConcentratesIron disulphideCsee PYRITEIRON ORECIIRON CONCENTRATE (pellet feed, sinter feed)IRON ORECsee IRON CONCENTRATEIRON ORECIIRON CONCENTRATEIRON ORECsee IRON CONCENTRATE (pellet feed, sinter feed)IRON ORECIIRON CONCENTRATE (pellet feed, sinter feed)IRON ORECIIRON CONCENTRATE (pellet feed, sinter feed)IRON ORE PELLETSCIRON ORE PELLETSCIRON ORIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	FLY ASH	С	
Garbage tankageBsee TANKAGEGluten pelletsB or Csee SEED CAKEGRANULATED SLAGCGRANULATED TYRE RUBBERCGround nuts, mealB or CGround nuts, mealB or CSee SEED CAKEGYPSUMCHominy chopB or CILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATE (pellet feed, sinter feed)ASee Mineral ConcentratesIron disulphideCIRON ORECIRON ORECIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	Galena (lead sulphide)	А	see LEAD CONCENTRATE
Gluten pelletsB or Csee SEED CAKEGRANULATED SLAGCGRANULATED TYRE RUBBERCGround nuts, mealB or Csee SEED CAKEGYPSUMCHominy chopB or Csee SEED CAKEILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATE (pellet feed, sinter feed)AIRON ORECIron disulphideCIron ore (concentrate, pellet feed, sinter feed)AIRON ORECIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	Garbage tankage	В	see TANKAGE
GRANULATED SLAGCGRANULATED TYRE RUBBERCGround nuts, mealB or CGround nuts, mealB or CGYPSUMCHominy chopB or CILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATE (pellet feed, sinter feed)AIron disulphideCIron ore (concentrate, pellet feed, sinter feed)AIRON ORECIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	Gluten pellets	B or C	see SEED CAKE
GRANULATED TYRE RUBBERCGround nuts, mealB or Csee SEED CAKEGYPSUMCHominy chopB or Csee SEED CAKEILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAsee Mineral ConcentratesIRON CONCENTRATE (pellet feed, sinter feed)Asee Mineral ConcentratesIron disulphideCsee PYRITEIRON ORECIron ore (concentrate, pellet feed, sinter feed)Asee IRON CONCENTRATEIRON ORECIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBsee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	GRANULATED SLAG	С	
Ground nuts, mealB or Csee SEED CAKEGYPSUMCHominy chopB or Csee SEED CAKEILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATE (pellet feed, sinter feed)AIron disulphideCIron ore (concentrate, pellet feed, sinter feed)AIRON ORECIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	GRANULATED TYRE RUBBER	С	
GYPSUMCHominy chopB or Csee SEED CAKEILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAsee Mineral ConcentratesIRON CONCENTRATE (pellet feed, sinter feed)Asee Mineral ConcentratesIron disulphideCsee PYRITEIRON ORECItom ore (concentrate, pellet feed, sinter feed)IRON ORECItom ore (concentrate, pellet feed, sinter feed)IRON ORE PELLETSCItom ore (concentrate, pellet feed, sinter feed)IRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	Ground nuts, meal	B or C	see SEED CAKE
Hominy chopB or Csee SEED CAKEILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATE (pellet feed, sinter feed)AIron disulphideCIron disulphideCIron ore (concentrate, pellet feed, sinter feed)AIRON ORECIron ore (concentrate, pellet feed, sinter feed)AIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	GYPSUM	С	
ILMENITE CLAYAILMENITE SANDCIRON CONCENTRATEAIRON CONCENTRATE (pellet feed, sinter feed)AIron disulphideCIron disulphideCIron ore (concentrate, pellet feed, sinter feed)AIron ore (concentrate, pellet feed, sinter feed)AIRON ORECIron ore (concentrate, pellet feed, sinter feed)AIRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	Hominy chop	B or C	see SEED CAKE
ILMENITE SANDCIRON CONCENTRATEAsee Mineral ConcentratesIRON CONCENTRATE (pellet feed, sinter feed)Asee Mineral ConcentratesIron disulphideCsee PYRITEIRON ORECImage: Concentrate, pellet feed, sinter feed)Iron ore (concentrate, pellet feed, sinter feed)Asee IRON CONCENTRATE (pellet feed or sinter feed)IRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	ILMENITE CLAY	Α	
IRON CONCENTRATEAsee Mineral ConcentratesIRON CONCENTRATE (pellet feed, sinter feed)Asee Mineral ConcentratesIron disulphideCsee PYRITEIRON ORECImage: Concentrate, pellet feed, sinter feed)AIron ore (concentrate, pellet feed, sinter feed)Asee IRON CONCENTRATE (pellet feed or sinter feed)IRON ORE PELLETSCImage: Concentrate, pellet feed, sinter feed)IRON OXIDE, SPENT UN 1376BImage: Concentrate, pellet feed, sinter feed)Iron swarfBsee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	ILMENITE SAND	С	
IRON CONCENTRATE (pellet feed, sinter feed)Asee Mineral ConcentratesIron disulphideCsee PYRITEIRON ORECImage: Concentrate, pellet feed, sinter feed)AIron ore (concentrate, pellet feed, sinter feed)Asee IRON CONCENTRATE (pellet feed or sinter feed)IRON ORE PELLETSCImage: Concentrate, pellet feed, sinter feed)BIRON OXIDE, SPENT UN 1376BImage: Concentrate, pellet feed, sinter feed)Image: Concentrate, pellet feed, sinter feed)IRON OXIDE, SPENT UN 1376BImage: Concentrate, pellet feed, sinter feed)Image: Concentrate, pellet feed, sinter feed)Iron swarfBsee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	IRON CONCENTRATE	А	see Mineral Concentrates
Iron disulphideCsee PYRITEIRON ORECIron ore (concentrate, pellet feed, sinter feed)Asee IRON CONCENTRATE (pellet feed or sinter feed)IRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	IRON CONCENTRATE (pellet feed, sinter feed)	А	see Mineral Concentrates
IRON ORECIron ore (concentrate, pellet feed, sinter feed)Asee IRON CONCENTRATE (pellet feed or sinter feed)IRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	Iron disulphide	С	see PYRITE
Iron ore (concentrate, pellet feed, sinter feed)Asee IRON CONCENTRATE (pellet feed or sinter feed)IRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBSee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	IRON ORE	С	
IRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBStarfBStarfBStarfCIron swarfBStarfCIron swarfBStarfCIron swarfCIron swarfBIron swarfCIron swarf <td< td=""><td>Iron ore (concentrate, pellet feed, sinter feed)</td><td>Α</td><td>see IRON CONCENTRATE</td></td<>	Iron ore (concentrate, pellet feed, sinter feed)	Α	see IRON CONCENTRATE
IRON ORE PELLETSCIRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBsee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS			(pellet feed or sinter feed)
IRON OXIDE, SPENT UN 1376BIRON PYRITESCIron swarfBsee FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	IRON ORE PELLETS	С	
IRON PYRITES   C     Iron swarf   B   see FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	IRON OXIDE, SPENT UN 1376	В	
Iron swarf B see FERROUS METAL BORINGS, SHAVINGS, TURNINGS OR CUTTINGS	IRON PYRITES	С	
SHAVINGS, TURNINGS OR CUTTINGS	Iron swarf	В	see FERROUS METAL BORINGS,
CUTINGS			SHAVINGS, TURNINGS OR
Iron sponge spent R see IRON OVIDE SPENT	Iron sponge spent	B	See IRON OXIDE SPENT
IRONSTONE C	IRONSTONE	C C	Sterrow OMDE, SEENE
LABRADORITE C	LABRADORITE	C	
LEAD AND ZINC CALCINES A see Mineral Concentrates	LEAD AND ZINC CALCINES	Δ	see Mineral Concentrates
LEAD AND ZINC MIDDLINGS A see Mineral Concentrates	LEAD AND ZINC MIDDI INGS	Δ	see Mineral Concentrates
LEAD CONCENTRATE A see Mineral Concentrates	LEAD CONCENTRATE	Δ	see Mineral Concentrates
I FAD NITRATE IN 1469 R	LEAD NITRATE UN 1469	R	see winerar concentrates
LEAD ORE C	LEAD ORE	C	
Lead ore concentrate A see LEAD CONCENTRATE	Lead ore concentrate	A	see LEAD CONCENTRATE
LEAD ORE RESIDUE A see Mineral Concentrates	LEAD ORE RESIDUE	A	see Mineral Concentrates

LEAD SILVER CONCENTRATE       A       see Mineral Concentrates         Lead sulphide       A       see LEAD CONCENTRATE         Lead sulphide       A       see LEAD CONCENTRATE         Lead sulphide       A       see LEAD CONCENTRATE         Lignite       B       see BROWN COAL BRIQUETTES         LIME (INSLAKED)       B          LIMESTONE       C          LINTED COTTON SED       B          Linseed, expelled       B or C       see SFED CAKE         Linseed, extracted       B or C       see SFED CAKE         MaGNESIA (DEADBURNED)       C          Magnesia, clinker       C       see MAGNESIA (DEADBURNED)         Magnesia, clinker       C       see MAGNESIA (DEADBURNED)         Magnesia calcined       B       see MAGNESIA (UNSLAKED)         Magnesia calcined       B       see MAGNESIA (UNSLAKED)         Magnesia calcined       B       see MAGNESIA (UNSLAKED)         Magnesia calcined       C       see MAGNESIA (UNSLAKED)         Magnesia calcined       B       see MAGNESIA (UNSLAKED)         Magnesia calcined       B       see MAGNESIA (UNSLAKED)	BULK CARGO SHIPPING NAME	GROUP	REFERENCES
Lead sulphide (galena)     A     see LFAD SILVER CONCENTRATE       Lead sulphide (galena)     A     see LEAD CONCENTRATE       Lead sulphide (galena)     A     see LEAD CONCENTRATE       Lignite     B     see LEAD CONCENTRATE       Limes(UNSLAKED)     B     ILIMESTONE       LIMESTONE     C     ILIMESTONE       Linseed, expelled     B or C     see SEED CAKE       Linseed, expelled     B or C     see MAGNESIA (DEADBURNED)       Magnesia, clinker     C     see MAGNESIA (DEADBURNED)       Magnesia, ilightburned     B     see MAGNESIA (DEADBURNED)       Magnesia ilightburned     B     see MAGNESIA (UNSLAKED)       Magnesia cleined     B or C     see MAGNESIA (UNSLAKED)       Magnesia cleined     B or C     see MAGNESIA (UNSLAKED)	LEAD SILVER CONCENTRATE	A	see Mineral Concentrates
Lead sulphide     A     see LEAD CONCENTRATE       Lignite     B     see BROWN COAL BRIQUETTES       LIME (UNSLAKED)     B     see BROWN COAL BRIQUETTES       LINTED COTTON SEED     B     Linseed, expelled     B or C     see SEED CAKE       Linseed, extracted     B or C     see SEED CAKE     MAGNESIA (DEADBURNED)     C       MAGNESIA (DEADBURNED)     C     see MAGNESIA (DEADBURNED)     Magnesia, electro-fused     C     see MAGNESIA (DEADBURNED)       Magnesia, electro-fused     C     see MAGNESIA (DEADBURNED)     Magnesia, electro-fused     B     see MAGNESIA (UNSLAKED)       Magnesia, electro-fused     B     see MAGNESIA (UNSLAKED)     Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia, electro-fused     C     see MAGNESIA (UNSLAKED)     Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia, electro-fused     C     see MAGNESIA (UNSLAKED)     Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia, electro-fused     C     see MAGNESIA (UNSLAKED)     Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia calcined     B     See CAONESIA (UNSLAKED)     Magnesia calcined     B     see MAGNESIA (UNSLAKE	Lead silver ore	A	see LEAD SILVER CONCENTRATE
Lead sulphide (galena)     A     see LEAD CONCENTRATE       Lingite     B     see BROWN COAL BRIQUETTES       LIME (UNSLAKED)     B     E       LINTED COTTON SEED     B     E       Linseed, expelled     B or C     see SEED CAKE       Linseed, extracted     B or C     see SEED CAKE       MAGNESIA (DEADBURNED)     C     Magnesia, clinker     C       Magnesia, clinker     C     see MAGNESIA (DEADBURNED)     Magnesia, clictor-fused       Magnesia, clectro-fused     C     see MAGNESIA (DEADBURNED)       Magnesia, clectro-fused     B     see MAGNESIA (INSLAKED)       Magnesia calcined     C     see MAGNESIA (INSLAKED)       Magnesia calcined     B     see CAGNESIA (INSLAKED)       Magnesia calcined     B     see CAGNESIA (INSLAKED)       Magnesia calcined     B     see MAGNESI	Lead sulphide	А	see LEAD CONCENTRATE
Lignite   B   see BROWN COAL BRIQUETTES     LIME STONE   C     LIMESTONE   C     LINTED COTTON SEED   B     Linseed, extracted   B or C     MAGINESIA (DEADBURNED)   C     MAGINESIA (INSLAKED)   B     Magnesia, clinker   C     see MAGNESIA (DEADBURNED)   C     Magnesia, clinker   C     see MAGNESIA (DEADBURNED)   B     Magnesia, clinker   C     see MAGNESIA (DEADBURNED)   B     Magnesia, claicherd   B     sec MAGNESIA (DEADBURNED)   Magnesia calcined     Magnesia calcined   B     Magnesia calcined   C     Magnesia calcined   B     Magnesia calcined   C     Magnesia calcined   B or C     Magnesia calcined   B or C     Magnesia calcined   B or C <td>Lead sulphide (galena)</td> <td>А</td> <td>see LEAD CONCENTRATE</td>	Lead sulphide (galena)	А	see LEAD CONCENTRATE
LIME (UNSLAKED)   B     LIMTED COTTON SEED   B     Linseed, expelled   B or C     Linseed, expelled   B or C     Linseed, extracted   B or C     MAGNESIA (DEADBURNED)   C     MAGNESIA (DEADBURNED)   C     Magnesia, clinker   C     Magnesia, clettor-fused   C     Magnesia, clettor-fused   B     Magnesia, clettor-fused   B     Magnesia calcined   B     Magnesia, clettor-fused   C     Magnesia calcined   B     Magnesia calcined   C     Magnesia calcined <td< td=""><td>Lignite</td><td>В</td><td>see BROWN COAL BRIQUETTES</td></td<>	Lignite	В	see BROWN COAL BRIQUETTES
LIMESTONE     C       LINTED COTTON SEED     B       Linseed, expelled     B or C     see SEED CAKE       MAGNESIA (DEADBURNED)     C     see SEED CAKE       MAGNESIA (UNSLAKED)     B     B       Magnesia, clinker     C     see MAGNESIA (DEADBURNED)       Magnesia, cleator-fused     C     see MAGNESIA (UNSLAKED)       Magnesia ilghtburned     B     see MAGNESIA (UNSLAKED)       Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia caustic calcined     B     see MAGNESIA (UNSLAKED)       Magnesia caustic calcined     C     see MAGNESIA (UNSLAKED)       Magnesia caustic calcined     B     see MAGNESIA (UNSLAKED)       Magnesia caustic calcined     B     see MAGNESIA (UNSLAKED)       Magnesia caustic calcined     B     see MAGNESIA (DEADBURNED)       MAGNESIUM NITRATE UN 1474     B     MAGNESIUM NITRATE UN 1474       Maize, expelled     B or C     see SEED CAKE       Maize, expelled     B or C     see Mineral Concentrates       MAAGNESI CONCENTRAT	LIME (UNSLAKED)	В	X
LINTED COTTON SEED     B       Linseed, expelled     B or C     see SEED CAKE       Linseed, extracted     B or C     see SEED CAKE       MAGNESIA (DEADBURNED)     C     see SEED CAKE       MAGNESIA (DEADBURNED)     B     B       Magnesia, elinker     C     see MAGNESIA (DEADBURNED)       Magnesia, elinker     C     see MAGNESIA (DEADBURNED)       Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia calcined     B     see MAGNESIA (DEADBURNED)       Magnesia calcined     C     see MAGNESIA (DEADBURNED)       Magnesia calcined     C     see MAGNESIA (DEADBURNED)       Magnesia calcined     C     see MAGNESIA (DEADBURNED)       Magnesia calci	LIMESTONE	С	
Linseed, expelled       B or C       see SEED CAKE         Linseed, extracted       B or C       see SEED CAKE         MAGNESIA (DEADBURNED)       C         MAGNESIA (UNSLAKED)       B         Magnesia, cleinker       C       see MAGNESIA (DEADBURNED)         Magnesia, cleitor-fused       C       see MAGNESIA (DEADBURNED)         Magnesia calcined       B       see MAGNESIA (UNSLAKED)         Magnesia caustic calcined       B       see MAGNESIA (UNSLAKED)         Magnesia caustic calcined       B       see MAGNESIA (UNSLAKED)         Magnesia caustic calcined       C       see MAGNESIA (UNSLAKED)         Magnesia caustic calcined       B       see MAGNESIA (UNSLAKED)         Magnesia caustic calcined       B       see MAGNESIA (UNSLAKED)         Magnesia caustic calcined       B or C       see MAGNESIA (DEADBURNED)         MAGNESUM NTRATE UN 1474       B       Magnesia caustic calcinetatas	LINTED COTTON SEED	В	
Linseed, extracted     B or C     see SEED CAKE       MAGNESIA (UNSLAACED)     B       Magnesia, clinker     C     see MAGNESIA (DEADBURNED)       Magnesia, clinker     C     see MAGNESIA (DEADBURNED)       Magnesia, clinker     C     see MAGNESIA (DEADBURNED)       Magnesia, clinker     B     see MAGNESIA (UNSLAKED)       Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia calcined     B     see MAGNESIA (UNSLAKED)       Magnesia calined     C     see MAGNESIA (DEADBURNED)       MAGNESITE, natural     C     see MAGNESIA (DEADBURNED)       MAGNESITE, natural     A     see MAGNESIA (DEADBURNED)       MAGNESITE, catural     A     see MAGNESIA (DEADBURNED)       Magnesia calinead     B or C     see SEED CAKE       Maize, extracted     B or C     see MONO AMMONIUM <t< td=""><td>Linseed, expelled</td><td>B or C</td><td>see SEED CAKE</td></t<>	Linseed, expelled	B or C	see SEED CAKE
MAGNESIA (DEADBURNED)     C       MAGNESIA (UNSLAKED)     B       Magnesia, clinker     C     see MAGNESIA (DEADBURNED)       Magnesia, clinker     C     see MAGNESIA (DEADBURNED)       Magnesia, clinker     B     see MAGNESIA (UNSLAKED)       Magnesia caustic calcined     B     see MAGNESIA (UNSLAKED)       Magnesia caustic calcined     B     see MAGNESIA (UNSLAKED)       Magnesia caustic calcined     C     see MAGNESIA (DEADBURNED)       MAGNESITE, natural     C     see MAGNESITE, natural       MAGNESIUM NITRATE UN 1474     B     Magnesitic-taconite       MAGNETITE     A     see MAGNESITE, natural       MAGNEST expelled     B or C     see SEED CAKE       Maize, extracted     B or C     see SEED CAKE       MAGANESE CONCENTRATE     A     see Mineral Concentrates       MAA, P.     C     see MONO AMMONIUM       MARBLE CHIPS     C     see SEED CAKE       Mill feed pellets     B or C     see SEED CAKE       Mill feed pellets     B or C     see SEED CAKE       Mill feed pellets     B or C     see SEED CAKE       Mill feed potash     C     see SEED CAKE </td <td>Linseed, extracted</td> <td>B or C</td> <td>see SEED CAKE</td>	Linseed, extracted	B or C	see SEED CAKE
MAGNESIA (UNSLAKED)   B     Magnesia, clinker   C   see MAGNESIA (DEADBURNED)     Magnesia, electro-fused   C   see MAGNESIA (UNSLAKED)     Magnesia calcined   B   see MAGNESIA (UNSLAKED)     Magnesia calcined   B   see MAGNESIA (UNSLAKED)     Magnesia caustic calcined   B   see MAGNESIA (UNSLAKED)     Magnesia caustic calcined   B   see MAGNESIA (DEADBURNED)     Magnesia caustic calcined   C   see MAGNESIA (DEADBURNED)     MAGNESITE, natural   C   see MAGNESITE, natural     MAGNESIUM NITRATE UN 1474   B   Magnesium carbonate     MAGNESIUM NITRATE UN 1474   B   Magnesium carbonate     Maize, extracted   B or C   see MAGNESITE, natural     Maize, extracted   B or C   see SEED CAKE     MANGANESE CONCENTRATE   A   see Mineral Concentrates     MANGANESE ORE   C   Magnesia causers     MA.P.   C   see MONO AMMONIUM     MARBLE CHIPS   C   see SEED CAKE     Mill feed pellets   B or C   see SEED CAKE     Mineral Concentrates   A   see Mineral Concentrates     Mineral Concentrates   A   see Mineral Concentrates     Mineral Concentrates   A   see Mineral Concentrates     <	MAGNESIA (DEADBURNED)	С	
Magnesia, clinker       C       see MAGNESIA (DEADBURNED)         Magnesia ighthurned       B       see MAGNESIA (DEADBURNED)         Magnesia calcined       B       see MAGNESIA (UNSLAKED)         Magnesia calcined       B       see MAGNESIA (UNSLAKED)         Magnesia caustic calcined       B       see MAGNESIA (UNSLAKED)         Magnesia calined       C       see MAGNESIA (DEADBURNED)         Magnesia caustic calcined       C       see MAGNESITE, natural         MAGNESITE, natural       C       MaGNESITE, natural         MAGNESITTE       A       see MAGNESITE         Maize, expelled       B or C       see SEED CAKE         Maize, extracted       B or C       see Monontitum         MAGANESE ORE       C       ManGANESE ORE       C         MARAGANESE ORE       C       see Monontitum       Monontitum         Mare of potash       C <td>MAGNESIA (UNSLAKED)</td> <td>В</td> <td></td>	MAGNESIA (UNSLAKED)	В	
Magnesia, electro-fusedCsee MAGNESIA (DEADBURNED)Magnesia ightburnedBsee MAGNESIA (UNSLAKED)Magnesia calcinedBsee MAGNESIA (UNSLAKED)Magnesia caustic calcinedBsee MAGNESIA (UNSLAKED)Magnesite clinkerCsee MAGNESIA (DEADBURNED)MAGNESITE, naturalCmagnesite clinkerMagnesite clinkerCsee MAGNESITE, naturalMAGNESIUM NITRATE UN 1474Bmagnesite-taconiteMAGNETITEAsee MAGNETITEMaize, expelledB or Csee SEED CAKEMaize, expelledB or Csee SEED CAKEMaize, extractedB or Csee SEED CAKEMAGANESE CONCENTRATEAsee MIneral ConcentratesMAARANESE CONCENTRATECsee SEED CAKEMARDALE CHIPSCsee SEED CAKEMARBLE CHIPSCsee SEED CAKEMild red pelletsB or Csee SEED CAKEMilorganiteCsee SEED CAKEMilorganiteCsee SEED CAKEMilorganiteCsee SEED CAKEMilorganiteCsee SEED CAKENiCKEL CONCENTRATEAsee Mineral ConcentratesNiCKEL CONCENTRATEAsee Mineral Concentrates	Magnesia, clinker	С	see MAGNESIA (DEADBURNED)
Magnesia lightburnedBsee MAGNESIA (UNSLAKED)Magnesia calcinedBsee MAGNESIA (UNSLAKED)Magnesia caustic calcinedBsee MAGNESIA (UNSLAKED)Magnesic clinkerCsee MAGNESIA (DEADBURNED)MAGNESITE, naturalCMAGNESITE, naturalCMAGNESIUM NITRATE UN 1474BMAGNESITEAMagnetite-taconiteAMagnetite-taconiteAMaize, expelledB or CMaize, extractedB or CMaize, extractedB or CMAGANESE CONCENTRATEAMAGANESE CONCENTRATEAMAGANESE ORECMARBLE CHIPSCMareal, oilyB or CMARBLE CHIPSCMaill feed pelletsB or CMill feed pelletsB or CMineral ConcentratesAMill feed pelletsB or CMineral ConcentratesAMineral ConcentratesAMill feed pelletsAMineral ConcentratesAMiles YENITE (mineral)ASee Mineral ConcentratesANICKEL CONCENTRATEANickel ore concentrateANickel ore concentrateANickel ore concentrateANickel ore concentrateB or CNickel ore concentrateB or CNiger seed, expelledB or CNiger seed, extractedB or CNiger seed, extractedB or CPalm kernel, expelledB or C	Magnesia, electro-fused	С	see MAGNESIA (DEADBURNED)
Magnesia calcinedBsee MAGNESIA (UNSLAKED)Magnesita caustic calcinedBsee MAGNESIA (UNSLAKED)Magnesite clinkerCsee MAGNESIA (DEADBURNED)MAGNESITE, naturalCMAGNESITE, naturalCMAGNESIUM NITRATE UN 1474BMAGNETITEAMagnetite-taconiteAMaize, expelledB or CMaize, expelledB or CMAGNESE CONCENTRATEAMANGANESE CONCENTRATEAMANGANESE ORECMARBLE CHIPSCMaral, oilyB or CMaral oilyB or CMaral oilyB or CMaral concentratesMilorganiteCMilorganiteCMuriate of potashCMuriate of potashCStee POTASSIUM CHLORIDENICKEL CONCENTRATEAsee Mineral ConcentratesMilorganiteCSee SEED CAKEMilorganiteCSee BIOSLUDGEMineral ConcentratesANICKEL CONCENTRATEAsee Mineral ConcentratesNickel ore concentrateNickel ore concentrateN	Magnesia lightburned	В	see MAGNESIA (UNSLAKED)
Magnesia caustic calcinedBsee MAGNESIA (UNSLAKED)Magnesite clinkerCsee MAGNESIA (DEADBURNED)MAGNESITE, naturalCMagnesitum carbonateCsee MAGNESITE, naturalMAGNESIUM NITRATE UN 1474BMAGNETITEAMagnesitue-taconiteAsee MAGNETITEMaize, expelledB or Csee SEED CAKEMaize, extractedB or Csee SEED CAKEMANGANESE CONCENTRATEAsee MONO AMMONIUMMARALE CHIPSCsee MONO AMMONIUMMARBLE CHIPSCsee SEED CAKEMill fed pelletsB or Csee SEED CAKENickel ore concentratesAsee Mineral ConcentratesNickel ore concentrateAsee Mineral ConcentratesNickel ore concentrateAsee Mineral ConcentratesNickel ore concentrateAsee Mineral ConcentratesNickel ore concentrateAsee SEED CAKENiger seed, expelledB or Csee SEED CAKENiger seed, extractedB or Csee	Magnesia calcined	В	see MAGNESIA (UNSLAKED)
Magnesite clinkerCsee MAGNESIA (DEADBURNED)MAGNESITE, naturalCMagnesium carbonateCMAGNESIUM NITRATE UN 1474BMAGNESIUM NITRATE UN 1474BMagnetite-taconiteAMaize, expelledB or CMaize, extractedB or Csee SEED CAKEMANGANESE CONCENTRATEAMARGANESE CONCENTRATEAMARGANESE CONCENTRATEAMARGANESE CONCENTRATECMANGANESE CONCENTRATECMANGANESE CONCENTRATEASee MONO AMMONIUMPHOSPHATECMARBLE CHIPSCMARBLE CHIPSCMaral oilyB or CSee SEED CAKEMill feed pelletsB or CSee SEED CAKEMill feed pelletsB or CSee BIOSLUDGEMineral ConcentratesAMONOAMMONIUM PHOSPHATECNEFELINE SYENITE (mineral)ANEFELINE SYENITE (mineral)ANickel ore concentrateANickel ore concentrateANickel ore concentrateB or CNiger seed, expelledB or CSee SEED CAKENiger seed, expelledB or CSee SEED CAKENiger seed, extractedB or CSee SEED CAKEPalm kernel, extractedB or CSee SEED CAKEPalm kernel, extractedB or CSee SEED CAKEPalm kernel, extractedB or CPalm kernel, extractedB or C	Magnesia caustic calcined	В	see MAGNESIA (UNSLAKED)
MAGNESITE, natural     C       Magnesium carbonate     C     see MAGNESITE, natural       MAGNESIUM NITRATE UN 1474     B     MAGNETITE       Magnetite-taconite     A     see MAGNETITE       Maize, expelled     B or C     see SEED CAKE       Maize, expelled     B or C     see SEED CAKE       MAIGANESE CONCENTRATE     A     see Mineral Concentrates       MANGANESE CONCENTRATE     A     see MONO AMMONIUM       MARBLE CHIPS     C     see MONO AMMONIUM       MARBLE CHIPS     C     see SEED CAKE       Meal, oily     B or C     see SEED CAKE       Mill feed pellets     B or C     see SEED CAKE       Mill feed pellets     B or C     see SEED CAKE       Milorganite     C     see BIOSLUDGE       Mineral Concentrates     A     MONOAMMONIUM PHOSPHATE       NEFELINE SYENITE (mineral)     A     see Mineral Concentrates       Nickel ore concentrate     A     see M	Magnesite clinker	С	see MAGNESIA (DEADBURNED)
Magnesium carbonateCsee MAGNESITE, naturalMAGNESIUM NITRATE UN 1474BMAGNETITEAMagnetite-taconiteAMaize, expelledB or Csee SEED CAKEMaize, extractedB or Csee SEED CAKEMAGANESE CONCENTRATEAMAGANESE CONCENTRATEAMARGANESE CONCENTRATEAMARGANESE CONCENTRATECMARGANESE ORECMARBLE CHIPSCMaral, oilyB or Csee SEED CAKEMill feed pelletsB or CMill feed pelletsB or CMineral ConcentratesMONOAMMONIUM PHOSPHATECsee BIOSLUDGEMineral ConcentratesAMONOAMMONIUM PHOSPHATECMuriate of potashCNICKEL CONCENTRATEANickel or concentrateANickel or concentrateANickel or concentrateANickel or concentrateB or Csee SEED CAKENiger seed, expelledB or Csee SEED CAKENiger seed, extractedB or CSee SEED CAKENiger seed, extractedB or Csee SEED CAKEPalm kernel, extractedB or CSee SEED CAKE<	MAGNESITE, natural	С	
MAGNESIUM NITRATE UN 1474BMAGNETITEAMagnetite-taconiteASee MAGNETITEMaize, expelledB or CMaize, extractedB or CMaize, extractedB or CMAGANESE CONCENTRATEASee Mineral ConcentratesMANGANESE ORECMA.P.CMARBLE CHIPSCMeal, oilyB or CSee SEED CAKEMilorganiteCMilorganiteCSee BIOSLUDGEMinorganiteCSee BIOSLUDGEMinorganiteCSee Mineral ConcentratesNiCKEL CONCENTRATEAsee Mineral ConcentratesNiCKEL CONCENTRATEASickel ore concentratesAMONOAMMONIUM PHOSPHATECSee SEED CAKENiCKEL CONCENTRATEASickel ore concentrateASickel ore concentrateASickel ore concentrateB or CSee SEED CAKENiger seed, expelledB or CSee SEED CAKENiger seed, expelledB or CSee SEED CAKENiger seed, expelledB or CSee SEED CAKEPalm kernel, extractedB or CSee SEED CAKE <td< td=""><td>Magnesium carbonate</td><td>С</td><td>see MAGNESITE, natural</td></td<>	Magnesium carbonate	С	see MAGNESITE, natural
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Magnetite-taconiteAsee MAGNETITEMaize, expelledB or Csee SEED CAKEMaize, extractedB or Csee SEED CAKEMANGANESE CONCENTRATEAsee Mineral ConcentratesMANGANESE ORECMANGANESE ORECMARBLE CHIPSCMeal, oilyB or Csee SEED CAKEMETAL SULPHIDE CONCENTRATESA and BMill feed pelletsB or Csee SEED CAKEMill feed pelletsB or Csee BIOSLUDGEMineral ConcentratesAMONOAMMONIUM PHOSPHATECMuriate of potashCsee POTASSIUM CHLORIDENEFELINE SYENITE (mineral)Asee Mineral ConcentratesNiCKEL CONCENTRATEAsee Mineral ConcentratesNickel ore concentrateAsee NICKEL CONCENTRATENiger seed, expelledB or Csee SEED CAKENiger seed, extractedB or Csee SEED CAKENiger seed, extractedB or Csee SEED CAKEPalm kernel, expelledB or Csee SEED CAKEPalm kernel, extractedB or Csee SEED CAKEP	MAGNETITE	А	
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Peanuts, expended of extracted   B of C   see SEED CAKE     PEANUTS (in shell)   C     PEAT MOSS   A and B     PEBRLES (sea)   C	Paim kernel, extracted	B or C	See SEED CAKE
PEANOTS (III shell)   C     PEAT MOSS   A and B     PEBRLES (sea)   C	DEANUTS (in shall)		SEE SEED CAKE
PERRIES (see)	PEAT MOSS	A and D	
	PERRIES (see)		
PELLETS (concentrates)	PFLIETS (concentrates)		

BULK CARGO SHIPPING NAME	GROUP	REFERENCES
Pellets (cereal)	B or C	see SEED CAKE
Pellets, wood pulp	В	see WOOD PULP PELLETS
Pencil pitch	В	see PITCH PRILL
PENTAHYDRATE CRUDE	А	see Mineral Concentrates
PERLITE ROCK	С	
PETROLEUM COKE, calcined	В	
PETROLEUM COKE, uncalcined	В	
PHOSPHATE ROCK, calcined	С	
PHOSPHATE ROCK, uncalcined	С	
PHOSPHATE, defluorinated	С	
PIG IRON	С	
PITCH PRILL	В	
Pollard pellets	B or C	see SEED CAKE
POTASH	С	
Potash muriate	С	see POTASSIUM CHLORIDE
POTASSIUM CHLORIDE	С	
POTASSIUM NITRATE UN 1486	В	
Potassium nitrate/sodium nitrate (mixture)	В	see SODIUM NITRATE AND
		POTASSIUM NITRATE MIXTURE
		UN 1499
POTASSIUM SULPHATE	С	
Prilled coal tar	В	see PITCH PRILL
PUMICE	С	
PYRITE (containing copper and iron)	С	
PYRITES, CALCINED	A and B	
PYRITES	А	see Mineral Concentrates
Pyrites (cupreous, fine, flotation, or sulphur)	Α	see PYRITES
Pyritic ash	A and B	see PYRITES, CALCINED
PYRITIC ASHES	А	see Mineral Concentrates
PYRITIC CINDERS	А	see Mineral Concentrates
PYROPHYLLITE	С	
QUARTZ	С	
QUARTZITE	С	
Quicklime	В	see LIME (UNSLAKED)
RADIOACTIVE MATERIAL, LOW SPECIFIC	В	
ACTIVITY (LSA-1) UN 2912		
RADIOACTIVE MATERIAL, SURFACE	В	
CONTAMINATED OBJECTS (SCO-1) UN 2913		
Rape seed, expelled	B or C	see SEED CAKE
Rape seed, extracted	B or C	see SEED CAKE
RASORITE (ANHYDROUS)	С	
Rice bran	B or C	see SEED CAKE
Rice broken	B or C	see SEED CAKE
Rough ammonia tankage	В	see TANKAGE
RUTILE SAND	С	
Safflower seed, expelled	B or C	see SEED CAKE
Safflower seed, extracted	B or C	see SEED CAKE
SALT	C	
SALT CAKE	C	
SALT ROCK	C	

BULK CARGO SHIPPING NAME	GROUP	REFERENCES
Saltpetre	В	see POTASSIUM NITRATE
SAND	С	
Sand, ilmenite	С	see ILMENITE SAND
Sand, zircon	С	see ZIRCON SAND
SAWDUST	В	
SCRAP METAL	С	
SEED CAKE Type (a) UN 1386	В	
SEED CAKE Type (b) UN 1386	В	
SEED CAKE UN 2217	В	
SEED CAKE (non-hazardous)	С	
Seed expellers, oily	B or C	see SEED CAKE
SILICOMANGANESE	B	
SILVER LEAD CONCENTRATE	A	see Mineral Concentrates
Silver lead ore concentrate	A	see SILVER LEAD CONCENTRATE
Sinter		see ZINC AND LEAD CALCINES
Slag granulated	С	see GRANULATED SLAG
SLIG iron ore	A	see Mineral Concentrates
SODA ASH	C C	see winerar concentrates
SODIUM NITRATE UN 1498	B	
SODIUM NITRATE AND POTASSIUM	B	
NITRATE MIXTURE IN 1499	Б	
Sovahean expelled	B or C	see SEED CAKE
Sovahean, extracted	B or C	see SEED CAKE
STAINI ESS STEEL GRINDING DUST		
Steel swarf	B	SEE FERROUS METAL BORINGS
Steel Swall	D	SHAVINGS TURNINGS OR
		CUTTINGS
Stibnite	С	see ANTIMONY ORE AND RESIDUE
STONE CHIPPINGS	С	
Strussa pellets	B or C	see SEED CAKE
SUGAR	С	
SULPHATE OF POTASH AND MAGNESIUM	С	
Sulphide concentrates	В	see METAL SULPHIDE
		CONCENTRATES
SULPHUR UN 1350	В	
Sunflower seed, expelled	B or C	see SEED CAKE
Sunflower seed, extracted	B or C	see SEED CAKE
SUPERPHOSPHATE	С	
SUPERPHOSPHATE (triple granular)	С	
Swarf	В	see FERROUS METAL BORINGS,
		SHAVINGS, TURNINGS OR
		CUTTINGS
TACONITE PELLETS	С	
TALC	С	
TANKAGE	В	
Tankage fertilizer	В	see TANKAGE
TAPIOCA	С	
Toasted meals	B or C	see SEED CAKE
Triple superphosphate	C	see SUPERPHOSPHATE, triple
1	_	granular

BULK CARGO SHIPPING NAME	GROUP	REFERENCES
UREA	С	
VANADIUM ORE	В	
VERMICULITE	С	
WHITE QUARTZ	C	
WOODCHIPS	В	
WOOD PELLETS	В	
WOOD PULP PELLETS	В	
ZINC AND LEAD CALCINES	Α	see Mineral Concentrates
ZINC AND LEAD MIDDLINGS	Α	see Mineral Concentrates
ZINC ASHES UN 1435	В	
ZINC CONCENTRATE	Α	see Mineral Concentrates
Zinc, dross, residue or skimmings	В	see ZINC ASHES
Zinc ore, burnt	Α	see ZINC CONCENTRATE
Zinc ore, calamine	Α	see ZINC CONCENTRATE
Zinc ore, concentrates	Α	see ZINC CONCENTRATE
Zinc ore, crude	Α	see ZINC CONCENTRATE
ZINC SINTER	Α	see Mineral Concentrates
ZINC SLUDGE	Α	see Mineral Concentrates
Zinc sulphide	A	see ZINC CONCENTRATE
Zinc sulphide (blende)	A	see ZINC CONCENTRATE
ZIRCON SAND	С	

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