INTERNATIONAL MARITIME ORGANIZATION

IMO

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SUB-COMMITTEE ON SHIP DESIGN AND EQUIPMENT
47th session
Agenda item 25

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REPORT TO THE MARITIME SAFETY COMMITTEE

Summary of decisions

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LIST OF ANNEXES

1 GENERAL

Introduction

1.1 The Sub-Committee held its forty-seventh session from 25 February to 5 March 2004 under the chairmanship of Mr. I. Ponomarev (Russian Federation).

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

ALGERIA
ARGENTINA
AUSTRALIA
BAHAMAS
BANGLADESH
BRAZIL
CAMEROON
CANADA
CHILE
CHINA
CROATIA
CUBA
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA
DENMARK
DOMINICA
ECUADOR
EGYPT
FINLAND
FRANCE
GERMANY
GREECE
INDONESIA
IRAN (ISLAMIC REPUBLIC OF)
IRELAND
ISRAEL
ITALY
JAPAN
LATVIA
LEBANON
LIBERIA
MALTA
MARSHALL ISLANDS
MOROCCO
NETHERLANDS
NIGERIA
NORWAY
PANAMA
PERU
PHILIPPINES
POLAND
PORTUGAL
REPUBLIC OF KOREA
ROMANIA
RUSSIAN FEDERATION
SAUDI ARABIA
SINGAPORE
SPAIN
SWEDEN
TURKEY
UNITED KINGDOM
UNITED STATES
VENEZUELA
YEMEN

and the following Associate Member of IMO:

HONG KONG, CHINA

1.3 The session was also attended by representatives from the following United Nations and specialized agencies:

INTERNATIONAL LABOUR ORGANIZATION (ILO)
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)

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

EUROPEAN COMMISSION (EC)

1.5 The session was also attended by observers from the following non-governmental organizations in consultative status:

INTERNATIONAL CHAMBER OF SHIPPING (ICS)
INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)
INTERNATIONAL CONFEDERATION OF FREE TRADE UNIONS (ICFTU)
BIMCO
INTERNATIONAL ASSOCIATION OF CLASSIFICATION SOCIETIES (IACS)
ICHCA INTERNATIONAL LIMITED (ICHCA)
OIL COMPANIES INTERNATIONAL MARINE FORUM (OCIMF)
INTERNATIONAL MARITIME PILOTS' ASSOCIATION (IMPA)
INTERNATIONAL ASSOCIATION OF INSTITUTES OF NAVIGATION (IAIN)
INTERNATIONAL FEDERATION OF SHIPMASTERS' ASSOCIATION (IFSMA)
INTERNATIONAL LIFE-SAVING APPLIANCES MANUFACTURERS' ASSOCIATION (ILAMA)
THE ASSOCIATION OF EUROPEAN SHIPBUILDERS AND SHIPREPAIRERS (AWES)
INTERNATIONAL ASSOCIATION OF INDEPENDENT TANKER OWNERS (INTERTANKO)
INTERNATIONAL COUNCIL OF CRUISE LINES (ICCL)
INTERNATIONAL ASSOCIATION OF DRY CARGO SHIPOWNERS (INTERCARGO)
THE INSTITUTE OF MARINE ENGINEERING, SCIENCE AND TECHNOLOGY (IMarEST)
THE INTERNATIONAL MARINE CONTRACTORS ASSOCIATION (IMCA)
WORLD NUCLEAR TRANSPORT INSTITUTE (WNTI)
INTERNATIONAL BULK TERMINALS ASSOCIATION (IBTA)
THE ROYAL INSTITUTION OF NAVAL ARCHITECTS (RINA)

Opening address

1.6 In welcoming the participants, the Secretary-General referred to the decisions made by MSC 77 with regard to bulk carrier safety and to the very good news that, according to INTERCARGO's provisional Bulk Carrier Casualty Report for 2003, there was not a single life lost in the four accidents involving bulk carriers (each of above 10,000 dwt) lost last year. He recalled the substantial progress made on enhancing the safety of bulk carriers, based on the contributions received from the sub-committees involved in this important task and the work done by the Committee, assisted by its Working Group on Bulk Carrier Safety, which had resulted in the approval and adoption, as appropriate, of a number of interpretations, recommendations, guidelines and performance standards.

The Secretary-General drew attention to the newly-adopted SOLAS provision for permanent means of access which was due to come into force on the 1st July of this year and recalled that the Technical Committee of the Assembly had noted the concerns expressed by the shipping industry and other interested parties with regard to the requirements which are due to come into effect on 1 January 2005 and had agreed that this important issue should be considered by the Sub-Committee first and then by MSC 78.

He stated that the decision of the Organization to give its fullest attention and care to ensure that the various IMO safety standards applicable to large passenger ships adequately serve their

purpose had been widely endorsed and the Sub-Committee's contribution to the MSC's work would be important. To this end, the Secretary-General noted that the Committee had agreed to re-establish the *ad hoc* Working Group on Large Passenger Ship Safety at MSC 78 and he encouraged the Sub-Committee to forward to the Committee any comments and proposals which may need detailed consideration.

In recalling the review of resolution A.744(18) on Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers the Secretary-General considered that it was essential that the Guidelines were kept up-to-date with all new developments and this required regular review of the provisions. Equally important was consideration of the proposed amendments concerning hull surveys of double hull oil tankers as prepared by the *ad hoc* correspondence group and, as instructed by MSC 77, the matter of survey of hatch covers and hatch opening, closing, securing and sealing systems with a view to developing relevant mandatory provisions.

With regard to marine environment-related issues, the Secretary-General recalled that the Sub-Committee had been tasked by the MEPC, in the context of MARPOL Annex VI on Prevention of air pollution from ships, to consider the development of draft Guidelines on on-board exhaust gas cleaning systems, which should include parameters for the benefit of manufacturers of such cleaning systems and which would be needed prior to the entry into force of that annex. The Sub-Committee was also expected to finalize proposed amendments to regulations 13F and 26 of MARPOL Annex I regarding the protection of pump-rooms of tankers and access to shore-based computer programs for salvage operations as well as to begin consideration of a draft new MARPOL regulation on the protection of fuel tanks against collision or stranding.

The Secretary-General referred to the extensive work undertaken expeditiously by the Organization to build an adequate maritime security infrastructure so that Governments and the industry, rising to the challenges of acting appropriately to protect shipping against international terrorism, had enough guidance to do so. He, therefore, urged all parties concerned, be it Administrations, designated authorities, port authorities, companies, recognized security organizations, training institutions or others, to intensify their efforts to meet the 1st July entry-into-force deadline for the new security regime specified in SOLAS chapter XI-2 and the International Ship and Port Facility Security Code. He further urged all parties concerned, in particular SOLAS Contracting Governments, to implement the new measures as early as possible as far as ships flying their flag and port facilities under their jurisdiction are concerned.

He argued that, while the 1st July deadline constituted a pact among Governments doing business in a civilized manner under the mutually binding provisions of a treaty instrument, this deadline meant nothing to terrorists who might decide to strike wherever and whenever it suited their evil purposes - and there was no doubt, that they would do so when they assessed that our defences were low or when they thought that our defences were not high enough to prevent and deter them from committing any atrocities they might have in mind to commit against our industry. While he, therefore, called for extreme vigilance and alertness, at the same time, he called for raising the defences as high as possible and as early as possible. The risks to life, the environment, property, international trade and, in the final analysis, the global economy were too high to allow for any complacent attitude. Terrorism was not a matter of concern to one country or a group of countries – it was a global issue and should be addressed as such. In so doing, it should be agreed that, in this particular case, maybe more than in others, prevention was better, much better, than cure.

1.7 The Chairman, in thanking the Secretary-General, stated that his words of encouragement as well as the advice and requests would be given every consideration by the Sub-Committee.

Attendance by a journalist

1.8 At the opening of the session, the Chairman sought the Sub-Committee's approval for a journalist from Lloyd's List to attend its deliberations. Following a short debate, the Sub-Committee agreed to allow the press to attend its deliberations at this session on condition that the reporting would accurately reflect the proceedings and the decisions made. When agreeing to allow the press to attend, the Sub-Committee and IMO retained the "right to reply" with regard to any published article relating to the Sub-Committee's proceedings.

1.9 During the week, a concern was expressed by a number of delegations on the way the meeting deliberations were reported by the press with quotation of statements or positions of specific delegations. As requested by the Sub-Committee, the Secretariat informed the press observer in question of the concerns expressed. In response to this, the press observer replied to the Secretariat that statements of delegations during the Sub-Committee debate would not be quoted in future reporting, and, with this assurance, the Sub-Committee allowed continual attendance by press observers during the session.

Election of Vice-Chairman

1.10 Being informed that its Vice-Chairman, Capt. P. San Miguel (Venezuela), had retired from the Venezuelan Maritime Administration and was therefore not available to continue in his post, the Sub-Committee, in accordance with the Rules of Procedure of the Maritime Safety Committee, unanimously elected Mrs. Xiang Yang (China) as Vice-Chairman for this session and the rest of the year 2004.

1.11 The Sub-Committee expressed its deep appreciation to Capt. P. San Miguel for his valuable contribution to the Sub-Committee's work and wished him every success in his new duties.

2 DECISIONS OF OTHER IMO BODIES

2.1 The Sub-Committee noted the decisions and comments pertaining to its work made by BLG 8, FSI 11, MSC 77, NAV 49, MEPC 49, SLF 46, DSC 8, C/ES.22, A 23, FP 48, STW 35 and COMSAR 8, as reported in documents DE 47/2, DE 47/2/1, DE 47/2/2, DE 47/2/3 and DE 47/2/4 and orally, and took them into account in its deliberations when dealing with relevant agenda items.

2.2 As reported in document DE 47/2/3, the Sub-Committee noted that the Council, at its twenty-second extraordinary session, in considering the outcomes of SLF 46 and DSC 8 with regard to the trial reporting system, had:

.1 noted that, under the provisional arrangements, the issue of the availability of working groups' reports in all working languages for consideration on the penultimate day of the session was not fully resolved, especially if the reports in question were voluminous;

.2 agreed that the trial period of the provisional system be extended to cover all the sub-committees which will meet between now and the next sessions of the MSC and the MEPC;

.3 invited the MSC and the MEPC to consider the conclusions and recommendations of the reporting sub-committees and to draw their own recommendations which they should submit to C 93 for consideration and action, as appropriate;

.4 agreed that all the working papers approved by the sub-committees in plenary should be posted on the IMO website; and

.5 agreed that, until further notice, sub-committees should produce an approved final summary of decisions to enable the Committee(s) to take action as may be requested at the first opportunity after a sub-committee's session (as done by SLF 46 and DSC 8).

2.3 The Sub-Committee also noted that MSC 77 had decided that, in the future, sub-committees should avoid developing unified interpretations for guidelines. In cases where the existing text of the guidelines was vague and needed modifications, the sub-committee concerned should amend the guidelines accordingly in lieu of developing unified interpretations.

3 AMENDMENTS TO RESOLUTION A.744(18)

3.1 The Sub-Committee had for its consideration under this agenda item documents submitted by Greece as the co-ordinator of the correspondence group (DE 47/3), Japan (DE 47/INF.11), Norway (DE 47/3/2) and IACS (DE 47/3/1 and DE 47/INF.2).

Instructions to the working group

3.2 Following discussion of the above documents, the Sub-Committee established the Working Group on Amendments to Resolution A.744(18) (ESP Guidelines) and instructed it, taking into account the comments and decisions made in plenary, to:

.1 based on documents DE 47/3 and DE 47/3/2 and taking into account document DE 47/INF.11, finalize the proposed amendments to the ESP Guidelines;

.2 to prepare draft amendments to the ESP guidelines based on the proposals from FSI 10 as contained in document DE 46/5;

.3 based on document DE 47/3/1, develop further amendments to the ESP Guidelines accommodating the revised IACS Unified Requirements Z10.1(Rev.11) and Z10.2(Rev.14);

.4 prepare further amendments to the ESP Guidelines to include requirements for the survey of hatch covers and hatch opening, closing, securing and sealing systems on bulk carriers (section 4 of MSC/Circ.1071), following the instructions of MSC 77;

.5 prepare draft amendments to SOLAS requiring that as-built construction drawings and other plans showing subsequent structural alterations are maintained on board and ashore;

.6 consider how IACS' Glossary of hull terms could be referenced and advise the Sub-Committee accordingly; and

.7 present a written report to plenary by Thursday, 4 March 2004.

Report of the working group

3.3 Having received the report of the working group (DE 47/WP.6), the Sub-Committee approved it in general and in particular (with reference to paragraphs of document DE 47/WP.6):

.1 invited IACS to submit to DE 48 its procedural requirement for surveyor monitoring of thickness measurements (paragraph 10.6.3);

.2 concurred with the proposed deletion of paragraphs 2.2.4 and 5.1.4 and relevant annexes of Annexes A and B to resolution A.744(18) because they had become obsolete or relevant procedures referred to had not been developed, respectively (paragraphs 11 and 12);

.3 invited the delegation of Japan to submit to DE 48 the final report on study on hull condition assessment for aged double hull oil tankers (paragraph 21);

.4 concurred with the group's recommendation not to make reference to the IACS surveyor's glossary of hull terms in the resolution (paragraph 22);

.5 noted the concerns of the group about the percentage of hatch cover sets on bulk carriers to be surveyed in operation, and agreed with the recommendation of the group that the cargo hatch covers in the forward quarter length and one additional hatch cover should be surveyed in operation annually (paragraph 26) for inclusion in the draft amendments to resolution A.744(18) and invited the Committee to agree with the recommendation of the Sub-Committee;

.6 agreed to the proposed amendments to resolution A.744(18), as set out in annex 1, for submission to MSC 79 for approval, with a view to subsequent adoption (paragraph 27 and annex 1);

In this context the Sub-Committee invited the Committee to note that after the entry into force of the standards for owner's inspections and maintenance of bulk carrier hatch covers, referred to in paragraph 15.7, and the aforementioned amendments to resolution A.744(18), MSC/Circ.1071 on Guidelines for bulk carrier hatch cover surveys and owner's inspections and maintenance would no longer be valid, as the provisions of the circular have been included in the aforementioned mandatory instruments;

.7 instructed the Secretariat to update the section "Content" of each of the three guidelines, before the proposed amendments were submitted to the Committee (paragraph 28);

.8 agreed to the draft new SOLAS regulation II-1/3-7 on construction drawings maintained on board and ashore, set out in annex 2, for submission to MSC 79 for approval, with a view to subsequent adoption (paragraph 29 and annex 2);

.9 agreed to the draft MSC circular on as-built construction drawings to be maintained on board the ship and ashore, set out in annex 3 (paragraph 30 and annex 3);

.10 concurred with the view of the group that requirements for provision and maintenance of as-built drawings covering other items, such as machinery installations, etc., should be developed and agreed to consider the matter further at the next session (paragraph 31);

.11 invited IACS to submit to DE 48 hull survey requirements for double-skin bulk carriers, when completed (paragraph 32); and

.12 agreed to earmark a working group on this agenda item at DE 48, in order to address anticipated submissions from IACS and Japan as mentioned in .1, .3 and .11 above.

3.4 In view of expected further work on the item as identified in paragraph 3.3 above, the Sub-Committee agreed to recommend to the Committee an extension of the target completion date of the item to 2005.

4 LARGE PASSENGER SHIP SAFETY

4.1 The Sub-Committee had for its consideration under this agenda item the report of the correspondence group submitted by the United States as the co-ordinator (DE 47/4).

4.2 The Sub-Committee noted that MSC 77 had instructed it to consider 35 recommendations contained in the report of the COMSAR Correspondence Group on Large Passenger Ship Safety (COMSAR 7/10/1) with a view to providing comments on those of them falling under its purview and to advise MSC 78 on what action ought to be taken in their context.

4.3 The Sub-Committee noted that the STW Sub-Committee, in evaluating training for bridge and engine-room resource management, had recalled that STCW Code section A-II/1 included requirements for bridge teamwork training and that while section B-VIII/2 provided advice on bridge resource management, engine-room resource management was not included in the STCW Convention or Code; and had agreed to seek advice from the DE Sub-Committee on engine-room resource management.

Instructions to the working group

4.4 Following consideration of the above documents, the Sub-Committee established a Working Group on Large Passenger Ship Safety and instructed it, taking into account the comments and decisions made in plenary and the outcome of FP 48, STW 35 and COMSAR 8, to:

.1 on the basis of the report of the correspondence group (DE 47/4), identify which tasks will require further action by the Sub-Committee and which tasks need no further action and provide appropriate explanatory text and target completion dates for the tasks requiring further consideration for submission to MSC 78;

.2 consider the issues of alternative designs and arrangements, acceptable casualty threshold definition, time to rescue and essential equipment, and develop recommendations on how these issues should be considered relative to the future work of the Sub-Committee;

.3 consider the recommendations made by COMSAR 7 (MSC 77/4) with a view to providing comments on those falling under the Sub-Committee's purview and, in particular, to advise MSC 78 on what action ought to be taken in their context;

.4 consider whether provisions for engine room resource management should be included in the STCW Convention or Code and advise the Sub-Committee accordingly;

.5 consider the need for a holistic approach and make recommendations as appropriate; and

.6 present a written report to plenary by Thursday, 4 March 2004.

Report of the working group

4.5 Having received the report of the drafting group (DE 47/WP.7), the Sub-Committee approved it in general and took action as indicated hereunder (with reference to paragraphs of document DE 47/WP.7).

Further work to be undertaken on large passenger ship safety

4.6 The Sub-Committee endorsed the work to be undertaken for the tasks assigned to the Sub-Committee on large passenger ship safety, as set out in annex 4, and agreed to forward this information to MSC 78 for consideration and action as appropriate (paragraphs 4 to 17 and annex 1).

4.7 In noting the group's views on matters related to alternative designs, acceptable casualty thresholds, time to rescue and essential equipment, the Sub-Committee agreed to invite MSC 78 to instruct SLF 47 to consider developing flooding scenarios (paragraphs 9 to 11, 25 and 26).

Recommendations prepared by the COMSAR Sub-Committee

4.8 The Sub-Committee noted the group's views on the recommendations prepared by COMSAR 7 and COMSAR 8 and invited MSC 78 and COMSAR 9 to take the group's views into account in the course of their respective deliberations on large passenger ship safety matters (paragraphs 18 to 22).

Engine-room resource management

4.9 The Sub-Committee endorsed the group's recommendation that engine-room resource management should also be included in the STCW Code and invited MSC 78 to instruct STW 36 to consider this view and take action as deemed appropriate (paragraph 23).

Holistic approach

4.10 In considering the group's views regarding the holistic approach and the process map developed to illustrate the connection between the work of this Sub-Committee and the relevant objectives and tasks recommended for further consideration (paragraphs 24 to 26 and annex 2), the Sub-Committee agreed that the process map, as set out in annex 5, should be further considered by MSC 78 with a view to preparing a similar approach for all the tasks undertaken on large passenger ship safety, taking into account the Sub-Committee's view, expressed before the group was convened, that a more holistic approach should be taken so that sub-committees assigned work on this matter are not working in isolation with respect to the issue as a whole.

4.11 The Sub-Committee noted the frequent use of the term "safe haven" and expressed the opinion that this term may be confused with the traditional meaning of a "safe harbour" and agreed to invite MSC 78 to consider using another term so as to avoid any confusion.

Re-establishment of the correspondence group

4.12 Having considered the above issues and taking into account the progress made at this session, the Sub-Committee agreed to re-establish the Correspondence Group on Large Passenger Ship Safety under the co-ordination of the United States*, pending the approval of MSC 78 to extend the target completion date for this work programme item, and instructed the group, taking into account the outcome of DE 47 (DE 47/WP.7), to:

.1 prepare performance standards for survival craft used on future large passenger ships;

.2 prepare the basic concept to be followed for approving alternative designs and arrangements;

.3 identify essential systems and equipment, taking into account documents MSC 74/INF.13 (ICCL), MSC 76/18/2 (IACS) and DE 47/4 (United States), and prepare appropriate performance standards;

.4 prepare SOLAS carriage requirements for infant personal life-saving appliances and review existing requirements for children's life-saving appliances with a view to providing appropriate recommendations;

.5 prepare performance standards for towing arrangements on future large passenger ships;

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.6 prepare a working definition for the damage control concept; and

.7 submit a report to DE 48.

5 MEASURES TO PREVENT ACCIDENTS WITH LIFEBOATS

5.1 The Sub-Committee had for its consideration under this agenda item documents submitted by China (DE 47/5/6), Japan (DE 47/5/3), Norway and Sweden (DE 47/5/4), the Republic of Korea (DE 47/5/1 and DE 47/5/2), the United States (DE 47/5/5) and the Secretariat (DE 47/5). The Sub-Committee also considered document DE 47/22/2 (ILAMA), dealing with the work plan for measures to prevent accidents with lifeboats, under this agenda item.

Instructions to the drafting group

5.2 Following discussion of the above documents, the Sub-Committee established a Drafting Group on Measures to Prevent Accidents with Lifeboats and instructed it, taking into account the comments and decisions made in plenary, to:

.1 finalize the draft amendments to SOLAS regulation III/19.3.3.4, taking into account documents DE 47/5/2 and DE 47/5/4;

.2 finalize the guidelines for safe practices during lifeboat drills on the basis of document DE 46/9, taking into account the outcome of STW 35, and prepare an associated MSC circular;

.3 finalize the draft guidelines for the simulated launching of free-fall lifeboats, taking into account document DE 47/5/1, and prepare an associated MSC circular;

.4 consider the draft guidelines for the development of operation and maintenance manuals for lifeboat systems, taking into account document DE 47/5/3, and advise the Sub-Committee accordingly;

.5 identify subjects for further consideration from the work plan to prevent accidents with lifeboats; and

.6 present a written report to plenary on Thursday, 4 March 2004.

Compatibility of life-saving appliances

5.3 With regard to document DE 47/5/6 on the compatibility of lifeboats and immersion suits, there was general agreement that this issue needs further consideration. The Sub-Committee agreed to recommend to the Committee the inclusion of a separate agenda item on "Compatibility of life-saving appliances" in the work programme and provisional agenda for DE 48 and invited submissions from Member Governments and international organizations to the next session.

Report of the drafting group

5.4 Having received the report of the drafting group (DE 47/WP.9), the Sub-Committee approved in general the part thereof dealing with this agenda item and, in particular (with reference to paragraphs of document DE 47/WP.9):

.1 endorsed the group's recommendation that basic safety training of crews for free-fall launching be referred to the STW Sub-Committee and invited the STW Sub-Committee accordingly;

.2 agreed to the draft MSC circular on Prevention of accidents in high free-fall launching, set out in annex 6, for urgent submission to MSC 78 for approval (paragraph 12 and annex 1);

.3 agreed to the draft MSC circular on Guidance on safety during abandon ship drills using lifeboats, set out in annex 7, for submission to the MSC for approval (paragraph 14 and annex 2);

.4 agreed to the draft MSC circular on Guidelines for simulated launching of free-fall lifeboats, set out in annex 8, for submission to the MSC for approval (paragraph 16 and annex 3);

.5 concurred with the group's view that the preparation of guidelines for the development of operation and maintenance manuals for lifeboat systems should include the following tasks:

.1 determination of the scope of the guidelines;

.2 consideration of which items should be included in the guidelines;

.3 consideration of requirements/precautions for developing such manuals; and

.4 development of examples of such manuals,

and invited Members and international organizations to submit comments on the issue to DE 48 (paragraphs 17 to 19); and

.6 agreed to the updated work plan for measures to prevent accidents with lifeboats, set out in annex 9 (paragraph 20 and annex 4).

5.5 With regard to the draft amendments to SOLAS regulation III/19.3.3.4. (see paragraph 5.2.1), most delegations did not support the idea that lifeboats be free-fall launched without any crew on board, in view of the requirement in the LSA Code that free-fall release mechanisms may only be operable from within the lifeboat. Furthermore, it was agreed that manoeuvring the boat in the water was considered an essential part of the drill. Accordingly, the Sub-Committee agreed that it was not advisable to amend SOLAS regulation III/19.3.3.4.

5.6 In view of the tasks contained in the updated work plan (see annex 9), the Sub-Committee agreed to recommend to the Committee the extension of the target completion date for the item to 2006 and invited Members and international organizations to submit comments and proposals on the tasks in the work plan to DE 48.

6 PROTECTION OF FUEL TANKS

6.1 The Sub-Committee had for its consideration under this agenda item documents submitted by Denmark (DE 47/6), Germany (DE 47/6/3), the United States (DE 47/6/4), BIMCO (DE 47/6/1) and AWES (DE 47/6/2). The Sub-Committee also considered documents DE 46/29 (Netherlands), BLG 7/INF.6 (IACS) and DE 46/INF.4 (INTERTANKO), which had been deferred from DE 46, and document MEPC 49/16/6 (Norway), referred to the Sub-Committee by MEPC 49. The Sub-Committee further considered document DE 47/WP.3 (Germany), containing a proposal for a draft new MARPOL regulation on the protection of fuel tanks.

Establishment of a correspondence group

6.2 Following consideration of the above documents, the Sub-Committee established a Correspondence Group on Protection of Fuel Tanks under the co-ordination of Germany* and instructed it, taking into account the comments and decisions made in plenary, to:

.1 develop a draft MARPOL regulation, or regulations, on the protection of fuel tanks, taking into account documents DE 47/6, DE 47/6/1, DE 47/6/2, DE 47/6/3, DE 47/6/4, DE 47/WP.3, DE 46/29, BLG 7/INF.6, DE 46/INF.4 and MEPC 49/16/6;

.2 give special consideration to the following issues:

.1 application to new ships only;

.2 application to smaller ships;

.3 use of the tank capacity as a criterion;

.4 application to heavy fuel oil; and

.5 use of the probabilistic outflow method; and

.3 submit a report to DE 48.

6.3 The Sub-Committee further agreed to earmark a working group to finalize the draft MARPOL requirements at DE 48.

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7 REVIEW OF FAST RESCUE BOAT AND MEANS OF RESCUE REQUIREMENTS

7.1 The Sub-Committee had for its consideration under this agenda item documents submitted by Finland (DE 47/7), Sweden (DE 47/INF.4) and ICS (DE 47/7/1).

7.2 The Sub-Committee discussed Finland's opinion that fast rescue boats should not be used as a means of rescue, ICS's analysis of the issues involved and the results of Sweden's study "Improvement in safety and function of fast rescue operations" and agreed that:

.1 fast rescue boats should not, as a rule, be regarded as means of rescue; and

.2 training with fast rescue boats needed to be enhanced, noting in this connection that the STW Sub-Committee was currently working on the issue.

7.3 Having invited the Committee to note the above conclusions, the Sub-Committee considered that no further work on the item was necessary and agreed to recommend to the Committee the deletion of the item from the work programme.

8 ANCHORING, MOORING AND TOWING EQUIPMENT

8.1 The Sub-Committee had for its consideration under this agenda item documents submitted by Australia (DE 47/8); IMPA, OCIMF, INTERTANKO, IAPH, IHMA and SIGTTO (DE 47/8/1) and IACS (DE 47/8/2). The Sub-Committee also considered document NAV 49/6 (IMPA and OCIMF), forwarded by NAV 49 for consideration and action, as appropriate.

8.2 After discussing the draft new SOLAS regulations on Anchoring, towing and mooring equipment and on Towing and mooring lines as proposed in document DE 47/8, the Sub-Committee invited interested delegations to get together in a group of experts and prepare a draft consolidated text of the regulations for consideration in plenary with a view to submission to the MSC for approval and subsequent adoption.

8.3 The Sub-Committee also instructed the Drafting Group on IACS Unified Interpretations, established under agenda item 13 (see paragraph 13.2), to prepare a draft MSC circular based on IACS Unified Requirement A2 on Shipboard fittings and supporting hull structures associated with towing and mooring on conventional vessels (DE 47/8/2).

8.4 Following consideration of the results of the group's discussion (DE 47/WP.8), the Sub-Committee agreed to the draft new SOLAS regulation on Anchoring, mooring and towing equipment, set out in annex 10, for submission to MSC 79 for approval with a view to adoption. The Sub-Committee also requested NAV 50 to consider the proposed new SOLAS regulation and provide its comments to MSC 79.

8.5 With regard to the draft SOLAS regulation on Towing and mooring lines, the Sub-Committee, following an indicative vote (14 delegations against developing the regulation and 10 delegations in favour), agreed not to pursue the matter further, being, in general, of the opinion that there was not sufficient justification of the need for such regulation.

8.6 Having considered the part of the report of the Drafting Group on IACS Unified Interpretations dealing with this item (DE 47/WP.10), the Sub-Committee noted the progress made with the development of a draft MSC circular on Shipboard fittings and supporting hull structures associated with towing and mooring on conventional ships, and agreed to finalize the draft MSC circular at DE 48. The Sub-Committee decided, in order that the provisions of IACS Unified Requirement A1 on Mooring and Anchoring could also be included in the draft circular, to instruct the Secretariat to prepare a document providing the text of the draft circular including the provisions of IACS Unified Requirement A1 and A2 for consideration at DE 48.

9 PERFORMANCE TESTING AND APPROVAL STANDARDS FOR SOLAS PERSONAL LIFE-SAVING APPLIANCES

9.1 The Sub-Committee had for its consideration under this agenda item documents submitted by Japan (DE 47/9/4), Norway and Sweden (DE 47/9/3), the United Kingdom (DE 47/9/2), the United States as the co-ordinator of the correspondence group (DE 47/9) and ILAMA (DE 47/9/1). The Sub-Committee also considered two documents by ILAMA (DE 45/19/1 and DE 45/19/2) which DE 46 had agreed to consider at this session.

9.2 The delegation of Dominica, noting the submission by Japan (DE 47/9/4), wherein Japan invited Member Governments to "strictly instruct the notifying bodes engaged in the testing for personal life-saving appliances to approve only products complying with the test procedures and criteria", suggested that addressing uniformity of enforcement was more critical to achieving improved safety than addressing any weaknesses or ambiguities in the technical requirements of SOLAS chapter III, the LSA Code or the associated test procedures. While improvements to the technical requirements can always be made, the Sub-Committee should not overlook the importance of uniform enforcement of the existing requirements. Further, the delegation of Dominica noted that in a number of examples given in the papers discussed, failure of the manufacturer and the notified body to apply clearly stated provisions was the basis for non-compliance. While technical improvements to IMO instruments are important, both need to be addressed and uniform enforcement can be pursued by the Sub-Committee without waiting until all the weaknesses or ambiguities are resolved. If the associated test procedures are not being strictly followed by the notifying bodes then this should be addressed as a matter of urgency by Administrations.

Establishment of a correspondence group

9.3 Following discussion of the above documents, the Sub-Committee re-established the Correspondence Group on Performance Testing and Approval Standards for SOLAS Personal Life-Saving Appliances under the co-ordination of the United States* and instructed it, taking into account the comments and decisions made in plenary:

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.1 on the basis of document DE 47/9 and taking into account documents DE 45/19/1, DE 47/9/1, DE 47/9/3 and DE 47/9/4, to prepare relevant amendments to SOLAS chapter III, the LSA Code and the Recommendation on testing of life-saving appliances (resolution A.689(17), as amended by resolution MSC.81(70)), as appropriate; and

.2 to submit a report to DE 48.

9.4 The Sub-Committee further agreed to earmark a working group to finalize the draft amendments to SOLAS chapter III, the LSA Code and the Recommendation on testing of life-saving appliances (resolution A.689(17), as amended by resolution MSC.81(70)), as appropriate, at DE 48.

Compatibility of life-saving appliances

9.5 With regard to document DE 47/9/2 on compatibility of lifejackets and marine evacuation systems, the Sub-Committee recalled that compatibility issues had already been dealt with under agenda item 5 (see paragraph 5.3), where it was agreed to discuss compatibility issues in general at DE 48. However, it was agreed that the correspondence group would take into account the issue of compatibility between immersion suits and personal life-saving appliances as raised in document DE 47/5/6.

List of outstanding issues

9.6 With regard to document DE 47/9/1 (ILAMA), containing a list of outstanding issues and proposals for relevant amendments to various instruments dealing with life-saving appliances, the Sub-Committee instructed the Drafting Group on Measures to Prevent Accidents with Lifeboats, established under agenda item 5 (see paragraph 5.2), to draft a justification for the inclusion of a relevant item in the work programme of the Sub-Committee, for consideration by the MSC.

9.7 Having considered the part of the report of the drafting group (DE 47/WP.9) dealing with this agenda item, the Sub-Committee agreed to recommend to the Committee the inclusion of a new item on "Inconsistencies in IMO instruments regarding requirements for life-saving appliances" in the work programme of the Sub-Committee. A justification for the item is set out in annex 11.

10 REVIEW OF THE 2000 HSC CODE AND AMENDMENTS TO THE DSC CODE AND THE 1994 HSC CODE

10.1 The Sub-Committee had for its consideration under this agenda item a document submitted by Australia (DE 47/10), containing proposed text of relevant amendments to the Codes, based on circulars MSC/Circ.1102 and MSC/Circ.1057.

10.2 Following consideration of the above document, the Sub-Committee agreed to establish a correspondence group, under the co-ordination of Australia*, and instructed it to prepare amendments to the 2000 and 1994 HSC Codes and the DSC Code, based on document DE 47/10 and taking into account comments and proposals made in plenary; and to submit a report to DE 48.

10.3 The Sub-Committee further agreed to earmark a working group to finalize, as the co-ordinating Sub-Committee on the issue, the draft amendments to the Codes at DE 48, subject to receipt of the contributions from the FP, COMSAR, NAV and SLF Sub-Committees which had also been instructed by the MSC to prepare relevant amendments.

11 PROTECTION OF PUMP-ROOMS OF TANKERS AND ACCESS TO SHORE-BASED COMPUTER PROGRAMS FOR SALVAGE OPERATIONS

11.1 The Sub-Committee had for its consideration under this agenda item a document submitted by INTERTANKO (DE 47/11), commenting on the proposals for amendments to regulations 13F and 26 of MARPOL Annex I as provided in document MEPC 47/18/1 (United Kingdom), which DE 46 had agreed to consider further at this session.

11.2 Following consideration of the above documents, the Sub-Committee agreed to the draft amendments to MARPOL Annex I, as set out in annex 12, for submission to MEPC 51 for consideration and action as appropriate, noting that whilst MEPC 49 approved, in principle, the draft revised MARPOL Annex I, MEPC 52 is expected, having incorporated amendments adopted at MEPC 50, to consider the aforementioned revised Annex I with a view to adoption.

11.3 Since work on the item had been completed, the Sub-Committee agreed to recommend to the MEPC the deletion of the item from the work programme.

12 FITTING OF WATER INGRESS ALARMS IN NEW, SINGLE HOLD CARGO SHIPS

12.1 The Sub-Committee had for its consideration under this agenda item a document submitted by the United Kingdom (DE 47/12), proposing a draft SOLAS regulation and related performance standards for new single hold cargo ships, adapted from newly adopted SOLAS regulation XII/12 and resolution MSC.145(77) regarding performance standards for water level detectors on bulk carriers.

12.2 Following debate, the Sub-Committee agreed on a draft new SOLAS regulation II-1/23-3 on Water level detectors on single hold cargo ships other than bulk carriers and draft Performance standards for water level detectors on bulk carriers and single hold cargo ships other

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than bulk carriers (which would supersede the performance standards adopted by resolution MSC.145(77), as set out in annexes 13 and 14, respectively, for submission to MSC 79 for approval with a view to adoption.

12.3 Since work on the item had been completed, the Sub-Committee agreed to recommend to the MSC the deletion of the item from the work programme.

13 CONSIDERATION OF IACS UNIFIED INTERPRETATIONS

13.1 The Sub-Committee had for its consideration under this agenda item a document submitted by the Secretariat (DE 47/13), containing the text of the unified interpretations (UI) falling under the purview of the Sub-Committee and the comments made at DE 46.

Instructions to the drafting group

13.2 Following discussion of the above document, the Sub-Committee agreed to establish a drafting group and instructed it to:

.1 finalize the text of the UIs in the form of draft MSC circulars, based on the texts contained in document DE 47/13 and taking into account comments and proposals made in plenary; and

.2 present a written report to plenary by Thursday, 4 March 2003.

Report of the drafting group

13.3 Having received the report of the drafting group (DE 47/WP.10), the Sub-Committee approved it in general and, in particular (with reference to paragraphs and annexes of document DE 47/WP.10), agreed to:

.1 the draft MSC circular on Unified interpretations to SOLAS chapter II-1 (paragraphs 8 to 18 and annex 1), as set out in annex 15; and

.2 the draft MSC circular on Unified interpretation to the Guidelines for Design, Construction and Operation of Passenger Submersible Craft (paragraph 19 and annex 2), as set out in annex 16,

for submission to MSC 79 for approval.

14 ALTERNATE HOLD LOADING BAN FOR BULK CARRIERS

14.1 The Sub-Committee had for its consideration under this agenda item documents submitted by Japan (DE 47/16/1, addressing agenda items 14, 15 and 16) and the Republic of Korea (DE 47/16, addressing agenda items 14 and 16) and ICS (DE 47/16/2, addressing items 14 and 16).

14.2 In the course of its consideration of the above documents, the Sub-Committee considered that a general understanding of the term ”empty hold” was necessary and agreed to instruct the working group to be established to look into the matter.

Instructions to the working group

14.3 Noting that MSC 77 had agreed on a provision for banning bulk carriers from sailing with any hold empty and had referred it to this session for appropriate action when preparing relevant amendments to SOLAS chapter XII, the Sub-Committee, in view of the fact that there were a number of agenda items relating to bulk carrier safety to be dealt with, agreed to establish a Working Group on Bulk Carrier Safety to finalize the work on those agenda items at this session (see also paragraphs 15.2, 15.3, 16.2, 17.3 and 18.2).

14.4 Subsequently, with regard to the item on alternate hold loading ban for bulk carriers, the Sub-Committee instructed the group to take the comments and proposals made in documents DE 47/16, DE 47/16/1 and DE 47/16/2 and in plenary into account when preparing draft amendments to SOLAS chapter XII regarding an alternate hold loading ban for bulk carriers and to also prepare a definition for the term ”empty hold” for the plenary’s consideration.

Report of the working group

14.5 Having received the report of the working group (DE 47/WP.5), the Sub-Committee approved in general the parts thereof dealing with this agenda item and:

.1 agreed to a provision for restricting bulk carriers from sailing with any hold empty for inclusion, as regulation 14, in the draft revised SOLAS chapter XII, set out in annex 17 (see also paragraph 15.8);

.2 with regard to the term "empty hold", the Sub-Committee agreed with the group’s opinion that with the proposed wording of draft regulation XII/14 (see annex 17), whereby a restriction would be imposed from sailing with any hold loaded to less than 10% of the hold’s maximum allowable cargo weight, if the ship did not comply with the proposed standards and criteria, there would be no need to define such a term (DE 47/WP.5, paragraph 15); and

.3 approved, in principle, the draft Standards and criteria for side structures of bulk carriers of single-side skin construction, together with the corresponding draft MSC resolution for their adoption, set out in annex 18, and agreed that they should be made mandatory under regulation XII/14 (see annex 17).

14.6 The Sub-Committee also agreed to request the DSC Sub-Committee, through the MSC, to consider whether any restrictions applied under draft regulation XII/14 should be annotated in the ship’s cargo loading manual.

14.7 Since work on the item had been completed, the Sub-Committee agreed to recommend to the MSC its deletion from the work programme.

15 DOUBLE-SIDE SKIN CONSTRUCTION OF BULK CARRIERS

15.1 The Sub-Committee had for its consideration under this agenda item documents submitted by Japan (DE 47/15, DE 47/16/3, DE 47/INF.9, DE 47/INF.10 and DE 47/16/1, addressing agenda items 14, 15 and 16) and IACS (DE 47/INF.5 and DE 47/INF.7).

15.2 With regard to document DE 47/16/3, the Sub-Committee noted the concerns expressed by ICS regarding the decision of MSC 76 to require double-side skin construction for all new

bulk carriers over 150 m length and their recommendation that the draft SOLAS regulation on double-side skin construction should provide the basic requirements for such designs without making this type of construction mandatory. Having noted that this matter was beyond the remit of the Sub-Committee and taking into account the information provided by Greece that new findings based on an FSA study on requiring double-skin construction had been submitted to MSC 78, the Sub-Committee agreed to refer the matter to MSC 78 for consideration and decision, as appropriate.

Instructions to the working group

15.3 Following consideration of the above documents, the Sub-Committee instructed the Working Group on Bulk Carrier Safety established under agenda item 14 (see paragraph 14.3) to further consider the definition of "double-side skin" as discussed at MSC 77 and also longitudinal strength aspects, taking into account the documents considered and comments and proposals made in plenary. The group was further instructed to consider the width of double-side spaces in bulk carriers of hybrid construction.

15.4 The Sub-Committee considered that, taking into account the applicability of the revised SOLAS chapter XII and the interpretation given in resolution MSC.89(71), a precise definition of bulk carrier was necessary and instructed the group accordingly.

15.5 With regard to document DE 47/INF.5, informing that IACS had developed a new Unified Requirement Z10.5 for hull surveys of double-side skin bulk carriers, the Sub-Committee referred the document to the Working Group on Amendments to Resolution A.744(18) for information purposes (see paragraph 3.3.11).

Report of the working group

15.6 Having received the report of the working group (DE 47/WP.5), the Sub-Committee approved in general the parts thereof dealing with this agenda item and:

.1 agreed to the modified definitions developed by the group (DE 47/WP.5, paragraphs 5 to 8) and included them in the draft revised SOLAS chapter XII set out in annex 17 (see also paragraph 15.8);

.2 agreed with the group's opinion that the 1997 SOLAS Conference resolution 6 should be footnoted under draft amended regulation XII/1.1 and invited the Committee to develop clear guidance to enable the unequivocal identification of a ship as a bulk carrier, which would also be footnoted under amended regulation XII/1.1; and

.3 concurred with the group's opinion that the minimum required clearance of 600 mm in draft regulation XII/6.3.2.3 should also apply to side structures of hybrid design.

15.7 The Sub-Committee, noting that the working group had also considered other matters related to specific draft regulations of SOLAS chapter XII, which were not explicitly mentioned in the group's terms of reference, considered the relevant parts of the group's report (DE 47/WP.5) and:

.1 approved in principle the draft Standards for owners' inspections and maintenance of bulk carrier hatch covers, together with the corresponding draft MSC resolution for their adoption, as set out in annex 19, and agreed that they should be made mandatory under draft regulation XII/7.2 (see annex 17);

.2 noted the discussion on the application of regulations XII/12 and 13 to woodchip carriers (DE 47/WP.5, paragraphs 12 and 13); and

.3 noted the industry's concerns regarding problems with the present availability of equipment required by regulation XII/12 (DE 47/WP.5, paragraph 14).

Proposed draft amendments to SOLAS chapter XII

15.8 The Sub-Committee, having considered the matters addressed under this agenda item, as well as those covered in agenda items 14, 16, 17 and 18, agreed in general to the proposed draft amendments to SOLAS chapter XII prepared by the group, for submission to MSC 78 with a view to formal approval and subsequent adoption at MSC 79 (see annex 17).

15.9 Since work on the item has been completed, the Sub-Committee agreed to recommend to the Committee its deletion from the work programme.

16 APPLICATION OF STRUCTURAL STANDARDS IN SOLAS CHAPTER XII

16.1 The Sub-Committee had for its consideration under this agenda item documents submitted by the Republic of Korea (DE 47/16, addressing agenda items 14 and 16), Japan (DE 47/16/1, addressing agenda items 14, 15 and 16, and DE 47/INF.6), BIMCO, ICS and INTERCARGO (DE 47/16/2) and ICS (DE 47/16/3).

Instructions to the working group

16.2 Following consideration of the above documents, the Sub-Committee instructed the Working Group on Bulk Carrier Safety established under agenda item 14 (see paragraph 14.3) to take the above documents and comments and proposals made in plenary into account when preparing draft amendments to SOLAS chapter XII on the basis of the proposal contained in document DE 47/16/2.

Report of the working group

16.3 Having received the report of the working group (DE 47/WP.5), the Sub-Committee approved in general the parts thereof dealing with this agenda item (DE 47/WP.5, paragraph 9) and agreed to the set of separate structural requirements for new bulk carriers of double-side skin construction contained in draft SOLAS regulation XII/6.3, as developed by the working group established at MSC 77, and incorporated it with some amendments in the draft revised SOLAS chapter XII, set out in annex 17 (see also paragraph 15.7).

16.4 Since work on the item had been completed, the Sub-Committee agreed to recommend to the Committee its deletion from the work programme.

17 IMPROVED LOADING/STABILITY INFORMATION FOR BULK CARRIERS

17.1 The Sub-Committee noted that, while no documents had been submitted to the session under this agenda item, document DE 47/16/2 contained draft amendments to SOLAS regulation XII/11 on Loading instrument, developed by SLF 46 (SLF 46/16, annex 4), to include provisions for bulk carriers of less than 150 m in length to be fitted with a loading instrument capable of providing information on the ship's stability in the intact condition. The Sub-Committee agreed that these provisions might be amended to also include longitudinal stress characteristics.

17.2 Noting further that SLF 46 had considered proposals on the development of guidelines for the provision of detailed, comprehensive and user-friendly information covering stability and longitudinal stress characteristics of the ship's hull during loading and unloading and had decided to further instruct its Correspondence Group on Intact Stability to develop the part of the guidelines addressing the provision of detailed, comprehensive and user friendly information covering the stability of the ship, the Sub-Committee agreed that it should deal with the longitudinal stress characteristics of the ship's hull.

Instruction to the working group

17.3 Subsequently, the Sub-Committee instructed the Working Group on Bulk Carrier Safety established under agenda item 14 (see paragraph 14.3) to consider amendments to SOLAS regulation XII/11, based on the amendments developed by SLF 46, and to prepare an outline of guidelines for the provision of detailed, comprehensive and user-friendly information covering the longitudinal stress characteristics of the ship's hull during loading and unloading.

Report of the working group

17.4 Having received the report of the working group (DE 47/WP.5), the Sub-Committee approved in general the parts thereof dealing with this agenda item (DE 47/WP.5, paragraph 17), concurred with the group's course of action regarding the provision of detailed, comprehensive and user-friendly longitudinal strength information and approved in principle the draft Guidelines for assessing the longitudinal strength of bulk carriers during loading, unloading and ballast water exchange, together with the draft covering MSC circular, as set out in annex 20, for submission to MSC 78 with a view to formal approval.

17.5 Since work on the item had been completed, the Sub-Committee agreed to recommend to the Committee its deletion from the work programme.

18 PERFORMANCE STANDARDS FOR PROTECTIVE COATINGS

18.1 Noting that no documents had been submitted under this agenda item, the Sub-Committee discussed the need for performance standards for protective coatings, taking into account the SOLAS provisions for corrosion prevention of sea water ballast tanks contained in regulation II-1/3.2.

Instructions to the working group

18.2 Consequently, the Sub-Committee instructed the Working Group on Bulk Carrier Safety established under agenda item 14 (see paragraph 14.3) to consider how to proceed with the development of performance standards for protective coatings, in particular whether there are adequate industry standards available and if these would suffice, and advise the Sub-Committee accordingly.

Report of the working group

18.3 Having received the report of the working group (DE 47/WP.5), the Sub-Committee approved in general the parts thereof dealing with this agenda item (DE 47/WP.5, paragraph 10) and, noting that IACS and the industry were currently engaged in developing guidelines for coatings in ballast tanks and that further standards for coatings in double-side skin spaces of bulk carriers could be developed if requested, agreed that the development of the proposed IMO performance standards for protective coatings referred to in draft regulation XII/6.4 (see annex 17) should only be undertaken when industry standards, or an advanced draft thereof, were available.

18.4 The Sub-Committee, therefore, invited the Committee to extend the target completion date for this item to 2005 and to request IACS and the industry to consider developing draft performance standards for protective coatings in double-side skin spaces of bulk carriers, and to inform DE 48 accordingly.

19 FREE-FALL LIFEBOATS WITH FLOAT-FREE CAPABILITY

19.1 Noting that no documents had been submitted to the session under this agenda item, the Sub-Committee instructed the Drafting Group on Measures to Prevent Accidents with Lifeboats established under agenda item 5 (paragraph 5.2) to finalize the draft amendments to SOLAS regulation III/31, as set out in paragraph 28.4 of the report of DE 46 (DE 46/32), and to advise the Sub-Committee on any further work necessary in this regard, e.g. amendments to the LSA Code and resolution A.689(17), development of performance standards, etc..

Report of the drafting group

19.2 Having received the report of the drafting group (DE 47/WP.9), the Sub-Committee approved in general the parts thereof dealing with this agenda item and agreed to keep the proposed amendments to SOLAS chapter III (DE 47/WP.9, paragraphs 4 to 8) in abeyance until such time as the relevant technology for float-free lifeboats had become available.

19.3 With regard to further work necessary on the item, the Sub-Committee noted the view of the group that there may be a need for the development of detailed performance standards for the float-free capability of free-fall lifeboats.

20 GUIDELINES ON ON-BOARD EXHAUST GAS CLEANING SYSTEMS

20.1 The Sub-Committee had for its consideration under this agenda item a document submitted by the United States (DE 47/20), providing comments on the development of guidelines for exhaust gas cleaning systems to reduce SOx emissions, as called for in regulation 14, Sulphur Oxides (SOx), of MARPOL Annex VI.

20.2 After consideration of the above document, the Sub-Committee agreed to establish a correspondence group under the co-ordination of the United States* and instructed the group to prepare draft Guidelines on onboard exhaust gas cleaning systems, for consideration at DE 48.

20.3 The Sub-Committee further agreed to recommend to the MEPC to change the priority of the item from low to high, in view of the expected entry into force of MARPOL Annex VI in the near future.

21 REVISION OF THE EXPLANATORY NOTES TO THE STANDARDS FOR SHIP MANOEUVRABILITY

21.1 The Sub-Committee had for its consideration under this agenda item documents submitted by the Republic of Korea (DE 47/21), the United States (DE 47/21/1), Japan (DE 47/21/2) and AWES (DE 47/21/3), all containing comments and proposals with regard to appendix 3 (Stopping ability of very large ships) of MSC/Circ.1053 (Explanatory notes to the standards for ship manoeuvrability).

21.2 After consideration of the above documents, the Sub-Committee agreed that there was no need to amend appendix 3 of the Explanatory Notes to the standards for ship manoeuvrability at this point in time.

21.3 The delegation of Japan, in agreeing with the above decision, expressed its intention to apply the draft revised appendix 3 of the Explanatory Note as contained in document MSC 76/WP.6 on a trial basis to very large crude oil tankers and bulk carriers, and to submit the results of such trial to IMO at a future time, if appropriate.

22 WORK PROGRAMME AND AGENDA FOR DE 48

Terms of reference of the Sub-Committee

22.1 As instructed by MSC 76, the Sub-Committee considered its terms of reference, taking into account document DE 47/22 (Chairman/Secretariat), and agreed to draft revised terms of reference as set out in annex 21 for submission to MSC 78 and MEPC 52 for consideration and action as appropriate.

22.2 The Sub-Committee debated, as requested by MSC 77, the proposal to consolidate, under one sub-committee, the responsibility for escape, evacuation and recovery which is currently under the FP, DE and COMSAR Sub-Committees, respectively, and agreed that all matters pertaining to SOLAS chapter III should remain under the purview of the Sub-Committee.

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22.3 The Sub-Committee further debated the request of SLF 46 to the Committee to transfer the consideration of structural strength of ships from the DE Sub-Committee to the SLF Sub-Committee and agreed that structural matters should be kept under the responsibility of the Sub-Committee, as indicated in paragraph 1.1 of the revised terms of reference (see annex 21).

Safety aspects of water ballast management

22.4 The Sub-Committee considered a document by Australia (DE 47/22/1), requesting that the work programme item "Safety aspects of water ballast management**"** be included in the provisional agenda for DE 48, in view of the conclusion of the International Conference on Ballast Water Management for Ships in February 2004, and agreed to the proposal by Australia. Special attention should be given to the proposed introduction of permission for transitory deviations from particular regulations of SOLAS and MARPOL.

22.5 The Sub-Committee also agreed to request the Committees to task the NAV and SLF Sub-Committees to similarly specify the permissible limits of transitory deviation for safety problem areas.

Work programme and agenda for DE 48

22.6 Taking into account the progress made at this session and the provisions of the agenda management procedure contained in paragraphs 3.11 to 3.23 of the Guidelines on the organization and method of work (MSC/Circ.1099 – MEPC/Circ.405), the Sub-Committee revised its work programme (DE 47/WP.1), based on that approved by MSC 77 (DE 47/2, annex), and invited the Committee to approve the proposed revised work programme and provisional agenda for DE 48 set out in annex 22.

Arrangements for the next session

22.7 The Sub-Committee agreed to establish, at its next session, working/drafting groups on the following subjects:

.1 protection of fuel tanks;

.2 performance testing and approval standards for SOLAS personal life-saving appliances;

.3 review of the 2000 HSC Code and amendments to the DSC Code and the 1994 HSC Code;

.4 guidelines on on board exhaust gas cleaning systems; and

.5 mandatory emergency towing systems in ships other than tankers greater than 20,000 dwt; or

.6 large passenger ship safety.*

* Depending on the outcome of MSC 78

22.8 The Sub-Committee noted that its forty-eighth session had been tentatively scheduled to take place from 21 to 25 February 2005.

Urgent matters emanating from DE 48

22.9 Noting the close proximity between DE 48 (March 2005) and MSC 80 (May 2005), the Sub-Committee invited MSC 78 to agree that, in addition to its work programme and agenda for DE 49, the outcome of DE 48 on the following items would be urgent matters to be considered by MSC 80:

.1 performance testing and approval standards for SOLAS personal life-saving appliances;

.2 review of the 2000 HSC Code and amendments to the DSC Code and 1994 HSC Code; and

.3 work programme of the Sub-Committee.

23 ELECTION OF CHAIRMAN AND VICE-CHAIRMAN FOR 2005

23.1 In accordance with the Rules of Procedure of the Maritime Safety Committee, the Sub-Committee unanimously re-elected Mr. I. Ponomarev (Russian Federation) as Chairman and Mrs. Xiang Yang (China) as Vice-Chairman for 2005.

24 ANY OTHER BUSINESS

Permanent means of access

24.1 As agreed by the twenty-third session of the Assembly, the Sub-Committee considered under this agenda item documents submitted by Greece (DE 47/24); the Republic of Korea (DE 47/24/6); BIMCO, ICS, INTERCARGO, INTERTANKO and OCIMF (DE 47/24/2 and A 23/17/4); IACS (DE 47/24/4); and IBTA (DE 47/24/7).

24.2 The Sub-Committee agreed to restrict the consideration of the issue to the proposal by Greece (DE 47/24) and to the other documents submitted under this item (see paragraph 24.1). New proposals introduced orally were not discussed, and delegations were invited to submit such new proposals directly to MSC 78.

24.3 With regard to a proposal by the Republic of Korea (DE 47/24/6) which was supported by the delegations of China; Greece and Hong Kong, China, to develop an MSC resolution which would grant an authority to Contracting Governments to regard the adopted revisions as equivalent to the current regulations until such time as the adopted revisions are brought into force, the Sub-Committee agreed that it should not consider this matter, as such a debate would require legal expertise and policy decision which should only be handled by the MSC.

24.4 The delegation of the Netherlands re-iterated its opinion stated at DE 45 that the technical specifications for permanent means of access were too prescriptive. The delegation was surprised and concerned regarding the wish to amend the already adopted permanent means of access requirements. Changing the adopted requirements would not tackle another problem which was the generally insufficient time to carry out the inspections. Apart from means of access, more time or more surveyors would be needed to perform cargo hold and tank surveys

properly. The Netherlands was concerned about amending newly adopted requirements which were not yet in force. This was not a positive signal to the shipping industry and public. The IMO membership should be prudent with the development of new regulations which often had deep implications, but if it was so decided, then the Netherlands was strongly in favour of more general, goal based or functional requirements.

24.5 After consideration of the above documents, the Sub-Committee invited a group of experts to prepare a consolidated draft text of proposed amendments to SOLAS regulation II-1/3-6 on Access to and within spaces in the cargo area of oil tankers and bulk carriers (resolution MSC.134(76)) and to the associated Technical Provisions for means of access for inspections (resolution MSC.133(76)) for the consideration of the plenary.

24.6 Having received the report of the group (DE 47/WP.11), the Sub-Committee agreed to a draft revised SOLAS regulation II–1/3–6 and the associated draft revised Technical Provisions, as set out in annexes 23 and 24, respectively, for submission to MSC 78 for appropriate action.

24.7 The delegation of Norway reserved its position on the outcome of the consideration of tables 1 and 2 of the Technical Provisions and stated its opinion that both the transverse and longitudinal permanent means of access below the deck head should have an upper and lower limit of 1.8 m and 3 m respectively. If the upper limit was increased to 1.8 m, this would create far better survey and working conditions for crew members and surveyors. The delegation was of the opinion that the proposal at it stands, with 1.6 m, was not acceptable.

Further, the Norwegian proposal to decrease the lower limit from 6 m to 3 m below the deck head all over, i.e. also for all the permanent means of access on the longitudinal bulkheads, would ensure better possibilities for close access to the structures, also for the crew members. On this height the permanent means of access could also facilitate the safe emergency escape on each side of the tank when rafting is used for close-up surveys.

The Norwegian delegation emphasised that one should keep in mind that the primary intention of the permanent means of access was to provide good survey access, especially to critical structural areas such as the under deck structures of oil tankers. To locate the permanent means of access in alignment with the longitudinal stringers as they were placed according to the present ship design should be secondary to the primary intention of improving the access.

The delegation of Norway was also of the opinion that the Sub-Committee should not reinstate the possibilities to install vertical ladders on transverse frames as these ladders would not provide the necessary safety for the persons climbing the ladders. Therefore, Norway also opposed item 1.1.6 in table 1.

24.8 Other delegations, in replying to the concerns of Norway, stressed that the choice of 1.6 m was made with the aim to avoid positioning the permanent means of access in sensitive areas of the ship where stress concentration was evident and where openings, if required, might compromise the structural strength of ships. The choice of 1.6 m was further made in order to use as permanent means of access elements forming part of the ship's structure, thus having a positive contribution to the overall strength of the ship.

Mandatory emergency towing systems (ETS) in ships other than tankers greater than 20,000 dwt

24.9 The Sub-Committee noted information provided by Germany (DE 47/24/1 and DE 47/INF.3) and IMCA (DE 47/24/3) and agreed that the item should be included in the provisional agenda for DE 48 so that the above documents could be discussed in detail at that session. The delegation of Germany kindly volunteered to submit to DE 48 a composite proposal for draft amendments to SOLAS regulation II-1/3-4 on Emergency towing arrangements on tankers, taking into account the comments and proposals made in plenary. The Sub-Committee invited interested Members to contribute to the preparation of the proposal*.

Rectification of chapter III of the SOLAS Convention

24.10 The Sub-Committee considered a document by Japan (DE 47/24/5), proposing rectifications to SOLAS chapter III for some cases where the regulation numbers referred to are no longer correct due to the adoption of the revised SOLAS chapter II-2 which entered into force on 1 July 2002. The Sub-Committee agreed that the proposed rectifications were necessary and invited the Committee to instruct the Secretariat to initiate the necessary process verbale of rectification.

Liferaft service interval extension

24.11 The Sub-Committee noted a document submitted by Canada (DE 47/INF.8), providing information resulting from a study examining the effects of increasing the time interval between service inspections on the life-saving reliability of liferafts.

Guidelines on the basic elements of a shipboard occupational health and safety programme

24.12 The Sub-Committee considered, as instructed by MSC 77, draft Guidelines on the basic elements of a shipboard occupational health and safety programme (BLG 8/WP.4), referred to it by BLG 8 and agreed that no modifications to the draft guidelines were necessary from the ship design and equipment point of view. The Secretariat was instructed to inform BLG 9 accordingly.

Expressions of appreciation

24.13 The Sub-Committee, noting that Mr. Henk De Rooy (Netherlands) would soon retire from his position in the Netherlands Shipping Inspectorate and that Mr. Zafrul Alam (Singapore) was returning to his home country to take up new duties, expressed appreciation for their valuable contribution to the work of the Sub-Committee over many years and wished them all the best in their future endeavours.

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New reporting procedure

24.14 At the end of the session, the Sub-Committee exchanged views with regard to the new reporting procedure. The following comments and proposals were made:

.1 several delegations were of the opinion that the new format, recording a summary of decisions only, did not reflect sufficiently the thread of arguments during the debates, therefore a full report should be prepared by the Secretariat after the session in addition to the summary of decisions and be submitted to the next session of the Sub-Committee;

.2 one delegation stated that the new reporting format did still not provide enough time for the deliberations in the working and drafting groups, therefore the translation services should be expanded so that the groups could work longer during the week;

.3 one delegation was of the view that the language arrangements should be re-considered, i.e. working papers might be considered in English only and a formal procedure should be established to deal with comments on the papers in French and Spanish. However, other delegations did not agree and were of the opinion that working papers should only be considered once available in all three working languages;

.4 one delegation stated that they preferred the new system, however, brief summaries of the debates in plenary should be included.

24.15 Noting that the Committees and the meeting of chairmen would consider the new reporting procedure further, the Sub-Committee agreed to bring the above comments to the attention of the MSC and MEPC.

25 ACTION REQUESTED OF THE COMMITTEES

25.1 The Maritime Safety Committee, at its seventy-eighth session, is invited to:

.1 consider the work to be undertaken for the tasks assigned to the Sub-Committee on large passenger ship safety and decide as appropriate (paragraph 4.6 and annex 4);

.2 with regard to matters related to alternative designs, acceptable casualty thresholds, time to rescue and essential equipment, instruct SLF 47 to consider developing flooding scenarios (paragraph 4.7);

.3 with regard to the recommendations prepared by COMSAR 7 and COMSAR 8, take the Sub-Committee's views into account in the course of the respective deliberations on large passenger ship safety matters (paragraph 4.8);

.4 with regard to engine-room resource management, instruct STW 36 to consider the recommendation that engine-room resource management should also be included in the STCW Code and to take action as appropriate (paragraph 4.9);

.5 with regard to the Sub-Committee's view that a more holistic approach should be taken so that sub-committees assigned work on large passenger ship safety are not working in isolation with respect to the issue as a whole, consider the process map developed to illustrate the connection between the work of this Sub-Committee and the relevant objectives and tasks recommended for further consideration (paragraph 4.10 and annex 5);

.6 regarding the frequent use of the term "safe haven" and the possibility that this term may be confused with the traditional meaning of a "safe harbour", consider using another term so as to avoid any confusion (paragraph 4.11);

.7 approve the draft MSC circular on Prevention of accidents in high free-fall launching (paragraph 5.42 and annex 6);

.8 approve draft revised SOLAS chapter XII with a view to adoption (paragraphs 14.5, 15.6, 15.8, 16.4 and annex 17);

.9 approve the draft MSC resolution on Standards and criteria for side structures of bulk carriers of single-side skin construction, and agree that they should be made mandatory under SOLAS regulation XII/14 (paragraph 14.5.3 and annex 18);

.10 request the DSC Sub-Committee to consider whether any restrictions applied under draft SOLAS regulation XII/14 should be annotated in the ship's cargo loading manual (paragraph 14.6);

.11 consider the concerns expressed by some delegations regarding the decision of MSC 76 to require double-side skin construction for all new bulk carriers over 150 m length and their recommendation that the draft SOLAS regulation on double-side skin construction should provide the basic requirements for such designs without making this type of construction mandatory and decide as appropriate (paragraph 15.2);

.12 develop clear guidance to enable the unequivocal identification of a ship as a bulk carrier, which would be footnoted under amended SOLAS regulation XII/1.1 (paragraph 15.6.2);

.13 approve the draft MSC resolution on Standards for owners' inspections and maintenance of bulk carrier hatch covers, and agree that they should be made mandatory under draft SOLAS regulation XII/7.2 (paragraph 15.7.1 and annex 19);

.14 approve the draft MSC circular on Guidelines for assessing the longitudinal strength of bulk carriers during loading, unloading and ballast water exchange, (paragraph 17.4 and annex 20);

.15 request IACS and the industry to consider developing draft performance standards for protective coatings in double-side skin spaces of bulk carriers and to inform DE 48 accordingly (paragraph 18.4);

.16 endorse the decision of the Sub-Committee to keep the proposed amendments to SOLAS chapter III regarding carriage requirements for free-fall lifeboats with float-free capability on bulk carriers in abeyance until such time when the relevant technology for float-free lifeboats has become available (paragraph 19.2);

.17 approve the draft revised terms of reference of the Sub-Committee (paragraph 22.1 and annex 21);

.18 note the view of the Sub-Committee that all matters pertaining to SOLAS chapter III should remain under the purview of the Sub-Committee (paragraph 22.2);

.19 note the view of the Sub-Committee that all structural matters should be kept under the responsibility of the Sub-Committee (paragraph 22.3);

.20 approve the proposed revised work programme of the Sub-Committee and the provisional agenda for DE 48 (paragraph 22.5 and annex 22);

.21 approve the draft revised SOLAS regulation II–1/3–6 on Access to and within spaces in, and forward of, the cargo area of oil tankers and bulk carriers and the associated draft revised Technical Provisions for means of access for inspections (paragraph 24.3 and annexes 23 and 24); and

.22 approve the report in general.

25.2 The Maritime Safety Committee, at its seventy-ninth session, is invited to:

.1 agree with the recommendation that the hatch covers in the forward quarter length and one additional hatch cover should be surveyed in operation annually for inclusion in the draft amendments to resolution A.744(18) (paragraph 3.3.5);

.2 approve the proposed amendments to resolution A.744(18) with a view to adoption (paragraph 3.3.6 and annex 1);

.3 note that after the entry into force of the standards for owner's inspections and maintenance of bulk carrier hatch covers, referred to in paragraph 15.7, and the aforementioned amendments to resolution A.744(18), MSC/Circ.1071 on Guidelines for bulk carrier hatch cover surveys and owner's inspections and maintenance would no longer be valid, as the provisions of the circular have been included in the aforementioned mandatory instruments (paragraph 3.3.6);

.4 approve the draft new SOLAS regulation II-1/3-7 on Construction drawings maintained on board and ashore, with a view to adoption (paragraph 3.3.8 and annex 2);

.5 approve the draft MSC circular on As-built construction drawings to be maintained on board the ship and ashore (paragraph 3.3.9 and annex 3);

.6 approve the draft MSC circular on Guidelines for safe practices during abandon ship drills using lifeboats for (paragraph 5.4.2 and annex 7);

.7 approve the draft MSC circular on Guidelines for simulated launching of free-fall lifeboats (paragraph 5.4.3 and annex 8);

.8 endorse the updated work plan for measures to prevent accidents with lifeboats (paragraph 5.4.5 and annex 9);

.9 note the view of the Sub-Committee regarding fast rescue boats and means of rescue (paragraphs 7.2 and 7.3);

.10 approve the draft new SOLAS regulation II-1/3-8 on Anchoring, mooring and towing equipment, with a view to adoption (paragraph 8.4 and annex 10);

.11 approve the draft new SOLAS regulation II-1/23-3 on Water level detectors on new single hold cargo ships other than bulk carriers, with a view to adoption (paragraph 12.2 and annex 13);

.12 approve the draft Performance standards for water level detectors on new single hold cargo ships other than bulk carriers with a view to adoption (paragraph 12.2 and annex 14);

.13 approve the draft MSC circular on Interpretations to SOLAS chapter II-1 (paragraph 13.3.1 and annex 15);

.14 approve the draft MSC circular on Interpretations to the Guidelines for design, construction and operation of passenger submersible craft (paragraph 13.3.2 and annex 16);

.15 note the view of the Sub-Committee that there was no need to amend appendix 3 (Stopping ability of very large ships) of the Explanatory notes to the standards for ship manoeuvrability (MSC/Circ.1053) at this point in time (paragraph 21.3);

.16 instruct the Secretariat to initiate the necessary process verbale of rectification to rectify references in SOLAS chapter III which have become incorrect with the entry into force of revised SOLAS chapter II-2 (paragraph 24.6); and

.17 note the view of the Sub-Committee that no modifications to the draft Guidelines on the basic elements of a shipboard occupational health and safety programme (BLG 8/WP.4) were necessary from the ship design and equipment point of view (paragraph 24.8).

25.3 The Marine Environment Protection Committee is invited to:

.1 approve the proposed new regulation 13I and amendments to regulation 26 of MARPOL Annex I with a view to adoption at MEPC 52 (paragraph 11.2 and annex 12); and

.2 agree with the Sub-Committee's recommendation to include the work programme item "Safety aspects of water ballast management" in the provisional agenda for DE 48 (paragraph 22.4);

.3 change the priority of the work programme item on "Guidelines on onboard exhaust gas cleaning systems" from low to high, in view of the expected entry into force of MARPOL Annex VI in the near future (paragraph 20.3); and

.4 agree with the Sub-Committee's recommendation to delete the item on "Protection of pump-rooms of tankers and access to shore-based computer programmes for salvage operations" from the work programme since the work had been completed (paragraph 11.3).

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ANNEX 1

PROPOSED 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 text of the above annex is contained in document DE 47/25/Add.1)

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ANNEX 2

DRAFT NEW SOLAS REGULATION II-1/3-7 ON CONSTRUCTION DRAWINGS MAINTAINED ON BOARD AND ASHORE

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

CHAPTER II-1

CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

PART A-1

STRUCTURE OF SHIPS

1 The following new regulation 3-7 is added after existing regulation 3-6:

"Regulation 3-7
Construction drawings maintained on board and ashore

1 A set of as-built construction drawings* and other plans showing any subsequent structural alterations shall be kept on board a ship constructed on or after [1 January 2007].

2 An additional set of such drawings shall be kept ashore by the company, as defined in regulation IX/1.2."

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* Refer to MSC/Circ.[….] on As-built construction drawings to be maintained on board the ship and ashore.

ANNEX 3

DRAFT MSC CIRCULAR

AS-BUILT CONSTRUCTION DRAWINGS TO BE MAINTAINED ON BOARD THE SHIP AND ASHORE

1 The Maritime Safety Committee, at its seventy-fourth session (30 May to 8 June 2001), in dealing with matters related to bulk carrier safety, considered the recommendation that ship owners should maintain on board and ashore as-built construction drawings and other plans showing subsequent structural alterations, and requested the Sub-Committee on Ship Design and Equipment (DE) to address the issue with the assistance of IACS, interested Member Governments and international organizations, with the aim of helping shipowners in the development of an effective and comprehensive maintenance programme for their ships.

2 The DE Sub-Committee, at its forty-seventh session (25 February to 5 March 2004), recognizing the importance of such as-built drawings for proper planning and conduct of surveys, repairs, owner's inspections, etc., not only for bulk carriers, but for all types of ships, prepared a list of relevant construction drawings with a view of ensuring uniform application of the relevant provisions of the 1974 SOLAS Convention.

3 The Maritime Safety Committee, at its [seventy-ninth session (1 to 10 December 2004)], following the recommendation of DE 47, approved the list of as-built construction drawings to be maintained on board the ship and ashore, as set out in the annex.

4 Member Governments are invited to bring the annexed list to the attention of shipowners, operators, ship masters, shipyards, recognized organizations and other parties involved in ship building, repairing, surveys and inspections.

ANNEX

**LIST OF AS-BUILT CONSTRUCTION DRAWINGS
TO BE MAINTAINED ON BOARD THE SHIP AND ASHORE**

Main plans

1 General arrangement
2 Capacity plan
3 Hydrostatic curves
4 Loading Manual, where required

Steel plans

1 Midship section
2 Scantling plan
3 Decks
4 Shell expansion
5 Transverse bulkheads
6 Rudder and rudder stock
7 Cargo hatch covers (when applicable)

Bilge ballast and cargo piping diagrams

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ANNEX 4

LIST OF TASKS ASSIGNED TO THE SUB-COMMITTEE AND WORK TO BE UNDERTAKEN ON LARGE PASSENGER SHIP SAFETY

Task	Work to be undertaken	Target completion date	Comments
Number and capacity of survival craft (Task 4.1)	To prepare performance standards for survival craft used on future large passenger ships	2006	
Design and effectiveness of survival craft (Task 4.2)	To be included in the work to be under taken on task 4.1	2006	
Launching systems (Task 4.3)	To be included in the work to be under taken on task 4.1	2006	
Arrangements for boarding and launching of survival craft (Task 4.4)	To be included in the work to be under taken on task 4.1	2006	
Safety of crew during drills and equipment testing (Task 4.5)	None		
Demographics of persons on board (Task 4.6)	None		
IMO and industry standards for PFDs (Task 4.7)	To prepare SOLAS carriage requirements for infant personal lifesaving appliances and review existing requirements for children's lifesaving appliances	2006	

Task	Work to be undertaken	Target completion date	Comments
Reliability of life-saving and recovery equipment (Task 4.8)	None		
Evaluation of equipment maintenance practices, policies and requirements and the role of maintenance in preventing casualties from occurring (Task 4.9)	None		
How to facilitate new concepts such as the use of new survival modules in lieu of traditional survival craft (Task 6.1)	To prepare the basic concept to be followed for approving alternative designs and arrangements	2005	This is an initial step before preparing relevant performance requirements
Measures to provide functional requirements for the approval of alternative designs and arrangements (Task 6.2)	To be included in the work to be under taken on task 6.1	2005	See comments for task 6.1
Segregated machinery space concept and vital system redundancy issues (Task 8.1)	To prepare performance standards for essential systems and equipment	2006	
Measures to ensure ship can safely proceed to port under its own power after fire or flooding (Task 8.2)	To be included in the work to be under taken on task 8.1	2006	
Emergency towing arrangements (Task 8.3)	To prepare performance standards on towing arrangements for large passenger ships	2006	Pending the outcome of the Sub-Committee's consideration of document DE 47/24/1

Task	Work to be undertaken	Target completion date	Comments
Damage control systems (Task 8.4)	To prepare a working definition for the damage control concept	2005	This is an initial step before preparing relevant performance requirements
Secondary command and control issues and communications capabilities (Task 8.5)	None		
Emergency power requirements (Task 8.6)	To be included in the work to be under taken on task 8.1	2006	
Identification of essential systems and equipment (Task 8.7)	To be included in the work to be under taken on task 8.1	2006	

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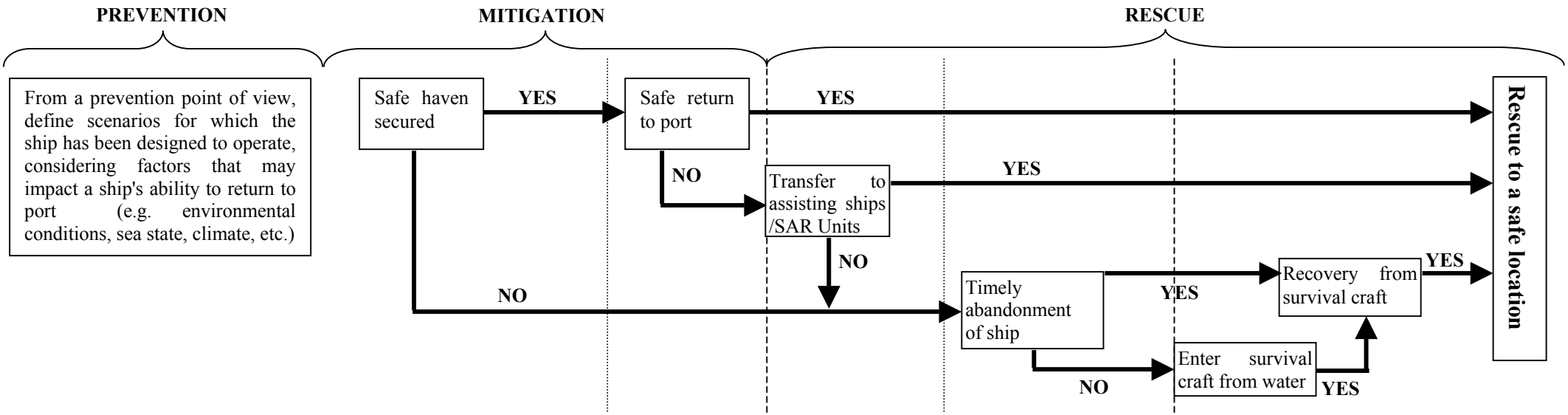
ANNEX 5

PROCESS MAP ON LARGE PASSENGER SHIP SAFETY



	PREVENTION	MITIGATION		RESCUE		
Tasks	1.7, 2.7, 7, 8.7, 9, 11 and 12	6.1, 8.1-8.4 & 8.6, 8.7	8.3	4.7	4.3, 4.4	4.1, 4.2, 6.2
Tasks recommended for further consideration by DE 47	- Prepare performance standards for essential systems and equipment as it relates to reliability. **<u>Tasks by other bodies</u>**: Develop performance standards for: **NAV**: navigation systems **SLF**: intact/damaged stability considering sea state and weather conditions, grounding, etc **STW**: training of personnel **MSC:** ship security and health safety	- Prepare concept/process for alternative designs /arrangements approvals (SOLAS chapter II-1) - Prepare performance standards for essential systems and equipment considering: * emergency power requirement/needs * reliability (segregation and redundancy)	- Prepare performance standards on towing arrangements for LPS	- Prepare SOLAS carriage requirements for infant personal lifesaving appliances and review current requirements for child lifesaving appliances	- Prepare performance standards for survival craft for future LPS including * Launching systems * Arrangement for boarding survival craft	- Prepare performance standards for survival craft for future LPS including * Number and capacity of survival craft * Design and effectiveness of survival craft - Prepare concept/process for alternative designs /arrangements approvals (SOLAS chapter III)
Task requiring assistance from other Sub-Committees to complete		FP (Fire Scenarios) SLF (Flooding Scenarios)				COMSAR (time to rescue)

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ANNEX 6

DRAFT MSC CIRCULAR

PREVENTION OF ACCIDENTS IN HIGH FREE-FALL LAUNCHING

1 The Maritime Safety Committee, [at its seventy-eighth session (12 to 21 May 2004),] considered reports of several injuries sustained by seafarers during free-fall launches of free-fall lifeboats from heights greater than 20 metres.

2 The Committee endorsed the proposal of the Sub-Committee on Ship Design and Equipment to add a relevant item to its short-term work plan for measures to prevent accidents with lifeboats, to consider the need for improvements to the requirements for design and configuration of free-fall lifeboat seating and launch arrangements to protect the occupants from harmful acceleration forces, particularly with regard to free-fall launch heights greater than 20 metres.

3 In the short term, recognizing the ongoing work of the Sub-Committee on Ship Design and Equipment to address this issue, the Committee, at its [seventy-eighth session (12 to 21 May 2004)], agreed that in enforcing the provisions of SOLAS regulation III/19.3.3.4 with regard to free-fall lifeboats being launched from heights greater than 20 metres, Administrations may accept launching by falls in lieu of free-fall launching, provided that a simulated free-fall launch is conducted at least every six months.

4 Member Governments are invited to bring this circular to the attention of their Administrations and all parties concerned.

5 This circular remains in effect for two years from the date of this circular unless revoked earlier.

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ANNEX 7

DRAFT MSC CIRCULAR

GUIDANCE ON SAFETY DURING ABANDON SHIP DRILLS USING LIFEBOATS

1 The Maritime Safety Committee, at its [seventy-ninth session (1 to 10 December 2004)], recalled that at its seventy-fifth session (15 to 24 May 2002) it considered the issue of the unacceptably high number of accidents with lifeboats that have been occurring over recent years in which crew were being injured, sometimes fatally, while participating in lifeboat drills and/or inspections.

2 The Committee further observed that most accidents fell under the following categories:

.1 failure of on-load release mechanism;
.2 inadvertent operation of on-load release mechanism;
.3 inadequate maintenance of lifeboats, davits and launching equipment;
.4 communication failure;
.5 lack of familiarity with lifeboats, davits, equipment and associated controls;
.6 unsafe practices during lifeboat drills and inspections; and
.7 design faults other than on-load release.

3 The Committee recalled that, at its seventy-fifth session, it had approved MSC/Circ.1049 on Accidents with lifeboats to draw the attention of manufacturers, shipowners, crews and classification societies to the personal injury and loss of life that may follow inadequate attention to the design, construction, maintenance and operation of lifeboats, davits and associated equipment, and urged all concerned to take necessary action to prevent further accidents with lifeboats. The Committee further recalled that, at its seventy-seventh session, it had endorsed the intention of the Sub-Committee on Ship Design and Equipment, in co-operation with the Sub-Committee on Standards of Training and Watchkeeping, to develop further IMO guidance.

4 Accordingly, the Committee approved the Guidance on safety during abandon ship drills using lifeboats, as set out in the annex.

5 The Committee noted that the Guidance developed for lifeboats has relevance, in general, for emergency drills with other life-saving systems and should be taken into account when such drills are conducted.

6 Member Governments are invited to bring the Guidance to the attention of their maritime Administrations, relevant industry organizations, manufacturers, shipowners, crews and classification societies.

7 Member Governments are further invited, while enforcing the provisions of SOLAS regulation IX/4.3, to ensure that the provisions of the annex are addressed through the Safety Management System of the company, as appropriate.

ANNEX

GUIDANCE ON SAFETY DURING ABANDON SHIP DRILLS USING LIFEBOATS

1 GENERAL

It is essential that seafarers are familiar with the life-saving systems on board their ships and that they have confidence that the systems provided for their safety will work and will be effective in an emergency. Frequent periodic shipboard drills are necessary to achieve this.

Crew training is an important component of drills. As a supplement to initial shore side training, on board training will familiarize crew members with the ship systems and the associated procedures for use, operation and drills. On these occasions the objective is to develop appropriate crew competencies enabling effective and safe utilization of the equipment required by the SOLAS Convention. The time limits set out in SOLAS for ship abandonment should be considered as a secondary objective when conducting drills.

1.2 Drill frequency

Experience has shown that holding frequent drills furthers the goal of making the crew familiar with the life-saving systems on board their ships and increasing their confidence that the systems will work and will be effective in an emergency. Drills give the crew opportunity to gain experience in the use of the safety equipment and in cooperation. The ability to cope with an emergency and handle the situation if the ship needs to be abandoned needs to be well rehearsed. However, frequent crew changes sometimes make it difficult to assure that all on board have had the opportunity to participate in drills if only the minimum required drills are conducted. Therefore, consideration needs to be given to scheduling drills as necessary to ensure all on board have an early opportunity to become familiar with the systems on board.

1.3 Drills must be safe

Abandon ship drills should be planned, organized and performed so that the recognized risks are minimized and in accordance with relevant shipboard requirements of occupational safety and health.

Drills provide an opportunity to verify that the life-saving system is working and that all associated equipment is in place and in good working order, ready for use.

Before conducting drills it should be checked that the lifeboat and its safety equipment have been maintained in accordance with the manufacturer's instructions, as well as noting all the precautionary measures necessary. Abnormal conditions of wear and tear or corrosion should be reported to the responsible officer immediately.

1.4 Emphasis on learning

Drills should be conducted with an emphasis on learning and viewed as a learning experience, not just a task to meet a regulatory requirement to conduct drills. Whether they are emergency drills required by SOLAS or additional special drills conducted to enhance the competence of the

crew members, they should be carried out at safe speed. During drills, care should be taken to ensure that everybody familiarizes themselves with their duties and with the equipment. If necessary, pauses should be made during the drills to explain especially difficult elements. The experience of the crew is an important factor in determining how fast a drill or certain drill elements should be carried out.

1.5 Planning and organising drills

SOLAS requires that drills shall, as far as practicable, be conducted as if there was an actual emergency*. This means that the entire drill should, as far as possible, be carried out. The point is that, at the same time, it must be ensured that the drill can be carried out in such a way that it is safe in every respect. Consequently, elements of the drill that may involve unnecessary risks need special attention or may be excluded from the drill.

In preparing for a drill, those responsible should review the manufacturers' instruction manual to assure that a planned drill is conducted properly. Those responsible for the drill should assure that the crew is familiar with the guidance provided in the life-saving system instruction manual.

Lessons learned in the course of a drill should be documented and made a part of follow-up shipboard training discussions and in planning the next drill session.

The lowering of a boat with its full complement of persons is an example of an element of a drill that may, depending on the circumstances, involve an unnecessary risk. Such drills should only be carried out if special precautions are observed.

2 ABANDON SHIP DRILLS

It is important that the crew who operate safety equipment on board are familiar with the functioning and operation of such equipment. SOLAS requires that sufficiently detailed manufacturers' training manuals and instructions be carried on board, which should be easily understood by the crew. Such manufacturers' manuals and instructions should be accessible for everyone on board and observed and followed closely during drills.

2.1 Guidance to the shipowner

The shipowner should ensure that new safety equipment on board the company's ships has been approved and installed in accordance with the provisions of SOLAS and the Life-saving Appliances (LSA) Code.

Procedures for holding safe drills should be included in the Safety Management System (SMS) of the shipping companies. Detailed procedures for elements of drills that involve a special risk should be evident from workplace assessments adjusted to the relevant life-saving appliance.

Personnel carrying out maintenance and repair work on lifeboats should be qualified accordingly.**

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* Refer to SOLAS regulation III/19.3.1.

** Refer to MSC/Circ.1093, Guidelines for periodic servicing and maintenance of lifeboats, launching appliances and on-load release year.

2.2 Lifeboats lowered by means of falls

In MSC/Circ.1049, dealing with accidents with lifeboats, the Maritime Safety Committee identified the following causes of accidents, to which special attention should be paid on board:

.1 failure of on-load release mechanism;
.2 inadvertent operation of on-load release mechanism;
.3 inadequate maintenance of lifeboats, davits and launching equipment;
.4 communication failure;
.5 lack of familiarity with lifeboats, davits, equipment and associated controls;
.6 unsafe practices during lifeboat drills and inspections; and
.7 design faults other than on-load release.

During drills, those responsible should be alert for conditions and situations stemming from the above items and should bring them to the attention of the responsible person for appropriate action. Feedback and improvement recommendations to the shipowner, the Administration and the system manufacturer are important elements of the marine safety system.

Before placing persons onboard a lifeboat, it is recommended that the boat first be lowered and recovered without persons on board to ascertain that the arrangement functions correctly. The boat should then be lowered into the water with only the number of persons on board necessary to operate the boat.

To prevent lashings or gripes from getting entangled, proper release should be checked before swinging out the davit.

2.3 Free-fall lifeboats

The monthly drills with free-fall lifeboats should be carried out according to the manufacturer's instructions, so that the persons who are to enter the boat in an emergency are trained to embark the boat, to take their seats in a correct way and to use the safety belts; and also be instructed on how to act during launching into the sea.

When the lifeboat is free-fall launched as part of a drill, this should be carried out with the minimum personnel required to manoeuvre the boat in the water, and to recover it. The recovery operation should be carried out with special attention, bearing in mind the high risk level of this operation. Where permitted by SOLAS, simulated launching should be carried out in accordance with the manufacturer's instructions and due note of MSC/Circ.[…..] on Guidelines for simulated launching of free-fall lifeboats.

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ANNEX 8

DRAFT MSC CIRCULAR

GUIDELINES FOR SIMULATED LAUNCHING OF FREE-FALL LIFEBOATS

1 The Maritime Safety Committee, at its [seventy-ninth session (1 to 10 December 2004)], recognizing the need to provide a basic outline of essential steps to safely carry out simulated launching of free-fall lifeboats required by SOLAS regulation III/19.3.3.4, and having considered proposals by the forty-seventh session of the Sub-Committee on Design and Equipment (DE), approved the Guidelines for simulated launching of free-fall lifeboats as set out in the annex.

2 Member Governments are invited to bring the annexed Guidelines to the attention of all parties concerned for their application, as appropriate.

ANNEX

GUIDELINES FOR SIMULATED LAUNCHING OF FREE-FALL LIFEBOATS

1 Definition

Simulated launching is a means of training the crew in the free-fall release procedure and verifying the satisfactory function of the free-fall release system without allowing the lifeboat to fall into the sea.

2 Purpose and scope

The purpose of these guidelines is to provide a basic outline of essential steps to safely carry out simulated launching. These guidelines are general; the lifeboat manufacturer's instruction manual should always be consulted before conducting simulated launching. Simulated launching should only be carried out with lifeboats and launching appliances designed to accommodate it, and for which the manufacturer has provided instructions. Simulated launching should be carried out under the supervision of a responsible person, who should be an officer experienced in such procedures.

3 Typical simulated launching sequence

.1 Check equipment and documentation to ensure that all components of the lifeboat and launching appliance are in good operational condition.

.2 Ensure that the restraining device(s) provided by the manufacturer for simulated launching are installed and secure and that the free-fall release mechanism is fully and correctly engaged.

.3 Establish and maintain good communication between the assigned operating crew and the responsible person.

.4 Disengage lashings, gripes, etc. installed to secure the lifeboat for sea or for maintenance, except those required for simulated free-fall.

.5 Participating crew board the lifeboat and fasten their seatbelts under the supervision of the responsible person.

.6 All crew, except the assigned operating crew, disembark the lifeboat. The assigned operating crew fully prepares the lifeboat for free-fall launch and secures themselves in their seats for the release operation.

.7 The assigned operating crew activates the release mechanism when instructed by the responsible person. Ensure that the release mechanism operates satisfactorily and the lifeboat travels down the ramp to the distance specified in the manufacturer's instructions.

.8 Recover the lifeboat to its stowed position, using the means provided by the manufacturer and ensure that the free-fall release mechanism is fully and correctly engaged.

.9 Repeat procedures from item .7 above, using the back-up release mechanism when applicable.

.10 The assigned operating crew disembarks the lifeboat.

.11 Ensure that the lifeboat is returned to its normal stowed condition. Remove any restraining and/or recovery devices used only for the simulated launch procedure.

***

ANNEX 9

UPDATED WORK PLAN FOR MEASURES TO PREVENT ACCIDENTS WITH LIFEBOATS

1 Short term (DE 48 - 2005)

.1 evaluate the adequacy of requirements for on-load release devices and remote control winches;

.2 consider the suitability of current griping systems, particularly some automatic systems that do not fall clear of the boat or davit. Also consider whether manual release and clearance may be the preferred system;

.3 identify possible changes to requirements on training and exercising of personnel for referral to the STW Sub-Committee (on-going);

.4 consider improvements to equipment and procedures for recovery of lifeboats; and

.5 consider the need to improve free-fall lifeboat seating and launching arrangements, particularly at high launch heights.

2 Medium term

.1 consider alternate life-saving concepts to lifeboats and launching appliances;

.2 prepare guidelines for development of operation and maintenance manuals for lifeboat systems;

.3 prepare guidelines on design, performance and quality of lifeboats; and

.4 develop a system approach for life-saving appliances and arrangements.

***

ANNEX 10

DRAFT NEW SOLAS REGULATION II-1/3-8 ON ANCHORING, MOORING AND TOWING EQUIPMENT

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

The following new regulation is added:

"**Regulation 3-8**
Anchoring, towing and mooring equipment

1 This regulation applies to ships constructed on or after [ ] but does not apply to emergency towing arrangements provided in accordance with regulation 3-4.

2 Ships shall be provided with arrangements, equipment and fittings of sufficient safe working load to enable the safe conduct of all anchoring, towing and mooring operations associated with the normal and emergency operations of the ship.

3 Arrangements, equipment and fittings provided in accordance with paragraph 2 shall meet the appropriate requirements of the Administration or an organization recognized by the Administration under regulation I/6.*

4 Each fitting or item of equipment provided under this regulation shall be clearly marked with any restrictions associated with its safe operation, taking into account the strength of its attachment to the ship's structure."

***

* Refer to MSC/Circ […] to be developed.

ANNEX 11

JUSTIFICATION FOR PROPOSED NEW WORK PROGRAMME ITEM (in accordance with MSC/Circ.931-MEPC/Circ.366)

INCONSISTENCIES IN IMO INSTRUMENTS REGARDING REQUIREMENTS FOR LIFE-SAVING APPLIANCES

1 Scope of the proposal

Examine and recommend amendments to:
Resolution MSC.48(66) (LSA Code)
Resolution A.689(17), as amended by resolution MSC.81(70) (Recommendation on testing of life-saving appliances)
MSC/Circ.980 (Standardized life-saving appliance evaluation and test report forms)
Resolution A.649(16) (1989 MODU Code) and amendments

Consideration should be given to the issues raised in, or associated with documents DE 42/3/3, DE 43/18 (paragraphs 3.4-3.5, 3.11, 3.13), DE 43/WP.6 (Annex 3), MSC 71/20/13, DE 44/19 (paragraphs 18.17-.19), DE 45/19/1, DE 45/27 (paragraphs 19.3 and 19.5), DE 46/32 (paragraph 9.40) and DE 47/9/1.

2 Compelling need

This work programme item is necessary to enable the DE Sub-Committee to appropriately address inconsistencies and ambiguities which it has identified between the LSA Code and the associated Recommendation on testing (resolution A.689(17), as amended by resolution MSC.81(70)), and to take full advantage of the Standardized evaluation and test report forms circulated as MSC/Circ.980. In the course of developing MSC/Circ.980, the Sub-Committee compiled a list of such inconsistencies and ambiguities in annex 3 to DE 43/WP.6. Accordingly, the Sub-Committee agreed (DE 43/18, paragraph 3.13) that the listed items needed to be clarified as soon as possible in order to meet the required level of safety. At its forty-fourth and forty-fifth sessions, the Sub-Committee reiterated the need for relevant amendments to the LSA Code, the Recommendation on testing, and MSC/Circ.980 (DE 44/19, paragraphs 18.17 to 18.19, and DE 45/27, paragraph 19.5). In each case, the Sub-Committee had in hand proposals from Members for such amendments, but noting that they could not be undertaken without direction from the Maritime Safety Committee, invited submission of appropriate proposals.

Until the identified ambiguities and inconsistencies discussed above have been rectified, manufacturers and Administrations will continue to have insufficient guidance to ensure that approved life-saving appliances consistently meet the required level of safety, thus putting mariners and passengers at unnecessary risk.

It is also necessary to update the life-saving requirements in Chapter 10 of the 1989 MODU Code to take into account the 1996 SOLAS amendments and the LSA Code, and other measures as may be implemented under current work to address accidents with lifeboats. Life-saving equipment used on MODUs is essentially identical to that used on ships.

3 Analysis of the issues involved, having regard to the costs to the maritime industry and global legislative and administrative burdens

The purpose of this effort would be primarily to correct and clarify existing requirements, and not to impose new ones, so the costs to the maritime industry would be expected to be minimal. The administrative burdens to the Organization and to Member States would be expected to be minimal as well.

4 Benefits

Costs to the international maritime industry of potential injury, loss of life, and associated costs will clearly be reduced by satisfactorily addressing this matter. Manufacturers of life-saving appliances will benefit by being provided with consistent and unambiguous requirements for the approved equipment they produce, and the work of Administrations (and nominated surveyors and recognized organizations acting on their behalf) in evaluating such equipment for approval will be facilitated. Elimination of inconsistencies in the relevant instruments is consistent with a system approach to life-saving appliances and arrangements.

5 Priority and target completion date

This matter should have high priority since the issues it addresses have been an ongoing cause of concern to Administrations and manufacturers, and continue to place mariners and passengers at unnecessary risk. It is expected that two sessions may be needed to properly deal with this matter.

6 Specific indication of the action required

In accordance with paragraph 1. In addition, as envisioned in DE 42/15 (paragraphs 3.2 and 3.14) and in the preambular text to MSC/Circ.980, the Sub-Committee should also consider whether, in light of experience which has been gained with the evaluation and test report forms in MSC/Circ.980, they might be amalgamated with resolution MSC.81(70).

7 Remarks on the criteria for general acceptance

.1 Is the subject of the proposal within the scope of IMO's objectives? -- Yes.

.2 Do adequate industry standards exist? -- No, this is a matter of refinement of existing IMO instruments. However, in the course of addressing the inconsistencies which have been identified in existing instruments the Sub-Committee may consider whether reference to suitable existing international standards may be the most efficient solution.

.3 Do the benefits justify the proposed action? -- Most definitely.

8 Identification of which subsidiary bodies are essential to complete the work

The work should be able to be accomplished by the DE Sub-Committee exclusively.

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ANNEX 12

DRAFT AMENDMENTS TO MARPOL ANNEX I

ANNEX I
REGULATIONS FOR THE PREVENTION OF POLLUTION BY OIL

Regulation 13I – Pump-room bottom protection

1 The following new regulation 13I is inserted after existing regulation 13H:

"**Pump-room bottom protection**

(1) This regulation applies to oil tankers of 5,000 tons deadweight and above constructed on or after […].

(2) The pump-room shall be provided with a double bottom such that at any cross-section the depth of each double bottom tank or space shall be such that the distance *h* between the bottom of the pump-room and the ship's base line measured at right angles to the ship's base line is not less than specified below:

h = B/15(m) or
h = 2 m, whichever is the lesser.

The minimum value of *h* = 1 m.

(3) In case of pump rooms whose bottom plate is located above the base line by at least the minimum height required in paragraph (2) above (e.g. gondola stern designs), there will be no need for a double bottom construction in way of the pump-room.

(4) Ballast pumps shall be provided with suitable arrangements to ensure efficient suction from double bottom tanks.

(5) Notwithstanding the provisions of paragraphs (2) and (3) above, where the flooding of the pump-room would not render the ballast or cargo pumping system inoperative, a double bottom need not be fitted.

Regulation 26 – Shipboard oil pollution emergency plan

2 The following new paragraph (4) is added at the end of the regulation:

"All oil tankers of 5,000 tons deadweight or more shall have prompt access to computerised, shore-based damage stability and residual structural strength calculation programs."

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ANNEX 13

DRAFT NEW SOLAS REGULATION II-1/23-3 ON WATER LEVEL DETECTORS ON SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS

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

The following new regulation 23-3 is added after existing regulation 23-2:

"Regulation 23-3
Water level detectors on single hold cargo ships other than bulk carriers

(This regulation applies to single hold cargo ships other than bulk carriers constructed on or after [ ])

1 Single hold cargo ships other than bulk carriers constructed before […] shall comply with the requirements of this regulation not later than the date of the intermediate or renewal survey of the ship to be carried out after […], whichever comes first.

2 For the purpose of this regulation, *freeboard deck* has the meaning defined in the International Convention on Load Lines in force.

3 Ships having a length (L_s as defined in part B-1 of this chapter) of less than 80 m, or 100 m if constructed before 1998, and a single cargo hold below the freeboard deck or cargo holds below the freeboard deck which are not separated by at least one bulkhead made watertight up to that deck, shall be fitted in such space or spaces with water level detectors∗.

4 The water level detectors required by paragraph 3 shall:

.1 give an audible and visual alarm at the navigation bridge when the water level above the inner bottom in the cargo hold reaches a height of not less than 0.3 m, and another when such level reaches not more than 15% of the mean depth of the cargo hold; and

.2 be fitted at the aft end of the hold, or above its lowest part where the inner bottom is not parallel to the designed waterline. Where webs or partial watertight bulkheads are fitted above the inner bottom, Administrations may require the fitting of additional detectors.

∗ Refer to resolution MSC…(79) on Performance standards for water level detectors on bulk carriers and single hold cargo ships other than bulk carriers.

5 The water level detectors required by paragraph 3 need not be fitted in ships complying with regulation XII/12, or in ships having watertight side compartments each side of the cargo hold length extending vertically at least from inner bottom to freeboard deck."

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ANNEX 14

DRAFT MSC RESOLUTION

PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO that, at its seventy-sixth session, it adopted amendments to chapter XII of the International Convention for the Safety of Life at Sea (SOLAS), 1974, *inter alia*, by introducing new regulation 12 requiring the installation of water level detectors for hold, ballast and dry spaces, which entered into force on 1 July 2004,

RECALLING FURTHER that, at its [eightieth] session, it adopted amendments to chapter II-1 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, by introducing new regulation 23-3 requiring the installation of water level detectors on single hold cargo ships other than bulk carriers,

BEARING IN MIND that the above-mentioned amendments are expected to enter into force on […] unless, prior to that date, specified conditions with regard to objections to the amendments are met,

RECOGNIZING that performance standards against which the operation and efficiency of the water level detectors can be measured, should be made available in good time before the above entry-into-force date,

RECOGNIZING ALSO the need to ensure that the required water level detectors provide reliable operation and that, to that extent, they are appropriately tested and installed,

HAVING CONSIDERED the recommendation made by the Sub-Committee on Ship Design and Equipment at its forty-sixth and forty-seventh sessions,

1. ADOPTS the Performance standards for water level detectors on bulk carriers and single hold cargo ships other than bulk carriers and the appended Guidelines on installation and testing of water level detection systems for bulk carriers and single hold cargo ships other than bulk carriers, as set out in the Annex to the present resolution;

2. URGES Governments to ensure that the annexed Performance standards and appended Guidelines are applied when water level detectors are installed on bulk carriers and single hold cargo ships other than bulk carriers flying their flags, in compliance with SOLAS regulations XII/12 and II-1/23-3;

3. REVOKES resolution MSC.145(77).

ANNEX

PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS

1 PURPOSE

These standards provide technical functional requirements for water level detection and alarm arrangements installed in bulk carriers for compliance with SOLAS regulation XII/12 or in single hold cargo ships other than bulk carriers for compliance with SOLAS regulation II-1/ 23-3.

2 DEFINITIONS

2.1 *Water level detector* means a system comprising sensors and indication devices that detect and warn of water ingress in cargo holds and other spaces as required in SOLAS regulations XII/12.1 or II-1/23-3.3.

2.2 *Sensor* means a unit fitted at the location being monitored that activates a signal to identify the presence of water at the location.

2.3 *Pre-alarm level* means the lower level at which the sensor(s) in the cargo hold space will operate.

2.4 *Main alarm level* means the higher level at which the sensor(s) in the cargo hold space will operate or the sole level in spaces other than cargo holds to which the requirements of SOLAS regulations XII/12 or II-1/23-3 apply.

2.5 *Visual indication* means indication by activation of a light or other device that is visible to the human eye in all levels of light or dark at the location where it is situated.

2.6 *Audible indication* means an audible signal that is detectable at the location where it is signalled.

3 FUNCTIONAL REQUIREMENTS

3.1 Means of detecting water level

3.1.1 The method of detecting water level may be by direct or indirect means as defined below:

.1 A direct means of detection determines the presence of water by physical contact of the water with the detection device.

.2 Indirect means of detection include devices without physical contact with the water.

3.1.2 The sensors should be capable of being located, in the case of single hold cargo ships complying with SOLAS regulation II-1/23-3 in the aft part of the hold or above its lowest point in such ships having an inner bottom not parallel to the designed waterline, or in the case of bulk carriers complying with SOLAS regulation XII/12 in the aft part of each cargo hold or in the lowest part of the spaces other than cargo holds to which that regulation applies.

3.1.3 The systems of detecting water level should be capable of continuous operation while the ship is at sea.

3.2 Detector system requirements

3.2.1 Detector systems should provide a reliable indication of water reaching a preset level.

3.2.2 The system should be capable of the following:

For cargo holds:

.1 An alarm, both visual and audible, activated when the depth of water at the sensor reaches the pre-alarm level in the space being monitored. The indication should identify the space.

.2 An alarm, both visual and audible, activated when the level of water at the sensor reaches the main alarm level, indicating increasing water level in a cargo hold. The indication should identify the space and the audible alarm should not be the same as that for the pre-alarm level.

For compartments other than cargo holds:

.3 An alarm, both visual and audible, indicating the presence of water in a compartment other than a cargo hold when the level of water in the space being monitored reaches the sensor. The visual and audible characteristics of the alarm indication should be the same as those for the main alarm level in a hold space.

3.2.3 Detection equipment should be suitably corrosion resistant for all intended cargoes.

3.2.4 The detector indicating the water level should be capable of activating to an accuracy of ±100 mm.

3.2.5 The part of the system which has circuitry in the cargo area, should be intrinsically safe.

3.3 Alarm system requirements

3.3.1 The visual and audible alarms should be suitable for location on the navigation bridge.*

3.3.2 Visual and audible alarms should conform to the Code on Alarms and Indicators, 1995, as applicable to a primary alarm for the preservation or safety of the ship.

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* Reference is made to the requirements of SOLAS regulations V/17 and V/18.

3.3.3 The visual and audible alarms should be capable of the following:

.1 Visual indication using a light of a distinct colour, or digital display that is clearly visible in all expected light levels, which does not seriously interfere with other activities necessary for the safe operation of the ship. The visual indication should be capable of remaining visible until the condition activating it has returned below the level of the relevant sensor. The visual indication should not be capable of being extinguished by the operator.

.2 In conjunction with the visual indication for the same sensor, the system should be capable of providing audible indication and alarms in the space in which the indicator is situated. The audible indication should be capable of being muted by the operator.

3.3.4 Time delays may be incorporated into the alarm system to prevent spurious alarms due to sloshing effects associated with ship motions.

3.3.5 The system may be provided with a capability of overriding indication and alarms for the detection systems installed only in tanks and holds that have been designed for carriage of water ballast (SOLAS regulation XII/12.1).

3.3.6 An override visual indication capability should be provided throughout deactivation of the water level detector for the holds or tanks referred to in 3.3.5 above. Where such an override capability is provided, cancellation of the override condition and reactivation of the alarm should automatically occur after the hold or tank has been de-ballasted to a level below the lowest alarm indicator level.

3.3.7 Requirements for malfunctions, alarms and indications should be capable of the following: A facility for continuous monitoring of the system which, on detecting a fault activates a visual and audible alarm. The audible alarm should be capable of being muted but the visual indication should remain active until the malfunction is cleared.

3.3.8 The water level detector system should be capable of being supplied with electrical power from two independent electrical supplies. Failure of the primary electrical power supply should be indicated by an alarm.

3.4 Testing

3.4.1 Water level detector systems should be type tested to demonstrate their robustness and suitability under the appropriate internationally recognized conditions*.

3.4.2 Detectors serving a cargo hold should be capable of being functionally tested *in situ* when the hold is empty using either direct or indirect methods.

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* With regard to testing, reference is made to IEC 60092-0504 and the IEC 60529.
Electrical components installed in the cargo holds, ballast tanks and dry spaces should satisfy the requirements of IP68 in accordance with IEC 60529.

3.5 Manuals

Documented operating and maintenance procedures for the water level detection system should be kept on board and readily accessible.

4 INSTALLATION AND TESTING

Guidelines on installation and testing of water level detection systems for bulk carriers and single hold cargo ships other than bulk carriers are set out in the appendix.

APPENDIX

GUIDELINES ON INSTALLATION AND TESTING OF WATER LEVEL DETECTION SYSTEMS FOR BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS

1 PURPOSE

These Guidelines provide procedures for installation and testing of water level detection and alarm systems installed in bulk carriers for compliance with SOLAS regulation XII/12, and in single hold cargo ships other than bulk carriers for compliance with SOLAS regulation II-1/23-3.

2 EQUIPMENT

2.1 Detector equipment type test requirements

2.1.1 Detector equipment should provide a reliable indication of water reaching a preset level and should be type tested to demonstrate their robustness and suitability under the appropriate conditions of IEC 60092-504 and the following:

.1 Protection of the enclosures of electrical components installed in the cargo holds, ballast tanks and dry spaces should satisfy the requirements of IP68 in accordance with IEC 60529. The water pressure testing of the enclosure should be based on a pressure head held for a period depending on the application. For detectors to be fitted in holds intended for the carriage of water ballast or ballast tanks the application head should be the hold or tank depth and the hold period should be 20 days. For detectors to be fitted in spaces intended to be dry the application head should be the depth of the space and the hold period should be 24 h.

.2 Operation in cargo/water mixture for a selected range of cargo groups such as iron ore dust, coal dust, grains and oils using seawater with a suspension of representative fine material for each cargo group. For type test purposes an agitated suspension of representative fine materials in seawater, with a concentration of 50% by weight, should be used with the complete detector assembly including any filtration fitted. The functioning of the detection assembly with any filtration arrangements should be verified in the cargo/water mixture with immersion repeated ten times without cleaning any filtration arrangements.

2.1.2 Protection of the enclosures of electrical equipment installed above ballast and cargo spaces should satisfy the requirements of IP56 in accordance with IEC 60529.

2.2 Detector equipment installation requirements

2.2.1 The sensors should be located in a protected position that is in communication with the specified part of the cargo hold (usually the aft part) such that the position of the sensor detects the level that is representative of the levels in the actual hold space. These sensors should be located:

.1 either as close to the centreline as practicable, or

.2 at both the port and starboard sides of the cargo hold.

2.2.2 The detector installation should not inhibit the use of any sounding pipe or other water level gauging device for cargo holds or other spaces.

2.2.3 Detectors and equipment should be installed where they are accessible for survey, maintenance and repair.

2.2.4 Any filter element fitted to detectors should be capable of being cleaned before loading.

2.2.5 Electrical cables and any associated equipment installed in cargo holds should be protected from damage by cargoes or mechanical handling equipment associated with bulk carrier operations, such as in tubes of robust construction or in similar protected locations.

2.2.6 Any changes/modifications to the ship's structure, electrical systems or piping systems that involves cutting and/or welding should be approved by the classification society before work is carried out.

3 SYSTEMS

3.1 Alarm system requirements

3.1.1 Alarm systems should be type tested in accordance with IEC 60092-504, as appropriate.

3.1.2 A switch for testing audible and visual alarms should be provided at the alarm panel and the switch should return to the off position when not operated.

3.2 Alarm system testing requirement

The visual and audible alarms should be tested to demonstrate the following:

.1 The visual indication may not be extinguished by the operator.

.2 It should be set at a level that alerts operators but does not interfere with the safe operation of the ship.

.3 They should be distinguishable from other alarms.

3.3 System test requirements

3.3.1 After installation a functionality test should be carried out. The test should represent the presence of water at the detectors for every level monitored. Simulation methods may be used where the direct use of water is impracticable.

3.3.2 Each detector alarm should be tested to verify that the pre-alarm and main alarm levels operate for every space where they are installed and indicate correctly. Also, the fault monitoring arrangements should be tested as far as practicable.

3.3.3 Records of testing of alarm systems should be retained on board.

4 MANUALS

Manuals should be provided on board and should contain the following information and operational instructions:

.1 A description of the equipment for detection and alarm arrangements together with a listing of procedures for checking that, as far as practicable, each item of equipment is working properly during any stage of ship operation.

.2 Evidence that the equipment has been type tested to the requirements of 2.1 above.

.3 Line diagrams of the detection and alarm system showing the positions of equipment.

.4 Installation instructions for orientation, setting, securing, protecting and testing.

.5 List of cargo groups for which the detector is suitable for operating in a 50% seawater slurry mixture (see paragraph 2.1.1.2).

.6 Procedures to be followed in the event of equipment not functioning correctly.

.7 Maintenance requirements for equipment and system.

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ANNEX 15

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS TO SOLAS CHAPTER II-1

1 The Maritime Safety Committee, [at its seventy-ninth session (1 to 10 December 2004)], approved the unified interpretations of the provisions of SOLAS chapter II-1 as set out in the attached annex, following the recommendations made by the Sub-Committee on Ship Design and Equipment at its forty-seventh session, with a view to ensuring a uniform approach towards the application of the provisions of SOLAS chapter II-1.

2 Member Governments are invited to use the annexed interpretations when applying relevant provisions of SOLAS chapter II-1, and to bring them to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATIONS TO CHAPTER II-1 OF THE 1974 SOLAS CONVENTION

1 SOLAS regulation II-1/26.11 Machinery installations – service tank arrangements

Arrangements complying with this regulation and acceptable "equivalent arrangements", for the most commonly utilised fuel systems, are shown below.

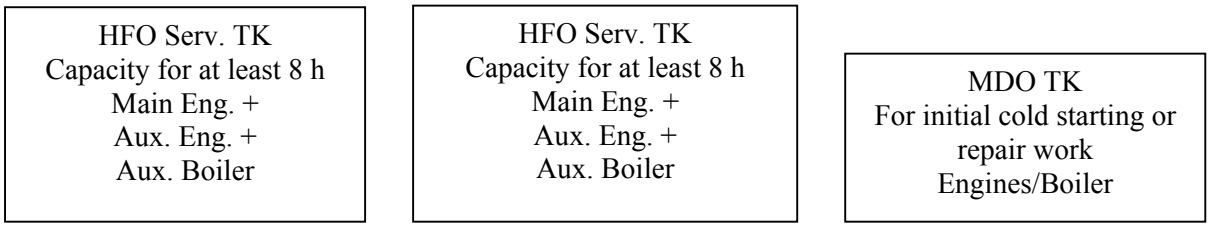
A service tank is a fuel oil tank which contains only fuel of a quality ready for use i.e. fuel of a grade and quality that meet the specification required by the equipment manufacturer. A service tank is to be declared as such and not to be used for any other purpose.

Use of a setting tank with or without purifiers, or purifiers alone, and one service tank is not acceptable as an "equivalent arrangement" to two service tanks.

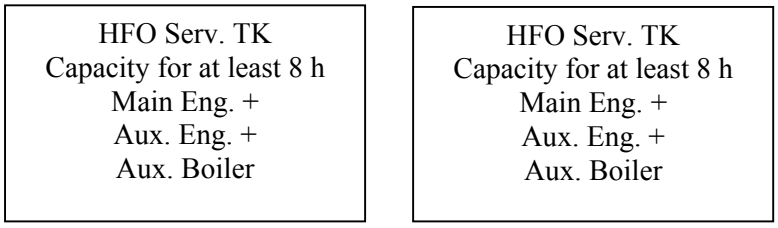
Examples of application for the most common systems

1 Main, auxiliary engines, and boilers operating with heavy fuel oil (HFO) (one fuel ship)

1.1 Requirement according to SOLAS



1.2 Equivalent arrangement



This interpretation only applies where main and auxiliary engines can operate with heavy fuel oil under all load conditions and, in the case of main engines, during manoeuvring.

For pilot burners of auxiliary boilers if provided, an additional MDO tank for 8 hours may be necessary.

2 SOLAS regulations II-1/40 and II-1/41
Essential services and arrangements of sources of power, supply, control and monitoring to the different categories of essential services

1 Classification of electrical services

1.1 Essential services are those services essential for propulsion and steering, and safety of the ship, which are made up of "Primary Essential Services" and "Secondary Essential Services". Definitions and examples of such services are given in 2 and 3 below.

1.2 Services to ensure minimum comfortable conditions of habitability are those services defined in 4 below.

2 Primary Essential Services

Primary Essential Services are those services which need to be in continuous operation to maintain propulsion and steering. Examples of equipment for primary essential services are as follows:

- steering gears;
- pumps for controllable pitch propellers;
- scavenging air blower, fuel oil supply pumps, fuel valve cooling pumps, lubricating oil pumps and cooling water pumps for main and auxiliary engines and turbines necessary for propulsion;
- forced draught fans, feed water pumps, water circulating pumps, vacuum pumps and condensate pumps for steam plants on steam turbine ships, and also for auxiliary boilers on ships where steam is used for equipment supplying primary essential services;
- oil burning installations for steam plants on steam turbine ships and for auxiliary boilers where steam is used for equipment supplying primary essential services;
- azimuth thrusters, which are the sole means for propulsion/steering with lubricating oil pumps, cooling water pumps;
- electrical equipment for electric propulsion plant with lubricating oil pumps and cooling water pumps;
- electric generators and associated power sources supplying the above equipment
- hydraulic pumps supplying the above equipment;
- viscosity control equipment for heavy fuel oil;
- control, monitoring, and safety devices/systems for equipment to primary essential services;
- fire pumps and other fire extinguishing medium pumps;
- navigation lights, aids and signals;
- internal safety communication equipment;
- lighting system.

3 Secondary Essential Services

Secondary Essential Services are those services which need not necessarily be in continuous operation to maintain propulsion and steering but which are necessary for maintaining the vessel's safety. Examples of equipment for secondary essential services are as follows:

- windlass;
- fuel oil transfer pumps and fuel oil treatment equipment;
- lubrication oil transfer pumps and lubrication oil treatment equipment;
- pre-heaters for heavy fuel oil;
- starting air and control air compressors;
- bilge, ballast and heeling pumps;
- ventilating fans for engine and boiler rooms;
- services considered necessary to maintain dangerous spaces in a safe condition;
- fire detection and alarm system;
- electrical Equipment for watertight closing appliances;
- electric generators and associated power sources supplying the above equipment;
- hydraulic pumps supplying the above equipment;
- control, monitoring, and safety systems for cargo containment systems;
- control, monitoring, and safety devices/systems for equipment to secondary essential services.

4 Services for habitability

Services for habitability are those services which need to be in operation for maintaining the ship's minimum comfort conditions for the crew and passengers. Examples of equipment for maintaining conditions of habitability are as follows:

- cooking;
- heating;
- domestic refrigeration;
- mechanical ventilation;
- sanitary and fresh water;
- electrical generators and associated power sources supplying the above equipment.

5 Regulation II-1/40.1.1 and regulation II-1/41.1.1 – For the purposes of these regulations, the services as included in paragraphs 2 to 4 are to be considered.

6 Regulation II-1/40.1.2 – For the purposes of this regulation, the services as included in paragraphs 2 and 3 and the services in regulation II-1/42 or II-1/43, as applicable, are to be considered.

7 Regulation II-1/41.1.2 – For the purposes of this regulation, the services as included in paragraphs 2 to 4, except for those also listed in Interpretation 3 (SOLAS chapter II-1, regulation 41.1.2), are to be considered.

8 Regulation II-1/41.1.5 – For the purposes of this regulation, the services as included in paragraphs 2, 3 and 4 are to be considered*.

9 Regulation II-1/41.5.1.2 – For the purposes of this regulation, the following interpretations are applicable:

* See also IACS UI SC83.

9.1 Services in paragraph 2 should not be included in any load shedding or other equivalent arrangements.

9.2 Services in paragraph 3 may be included in the load shedding or other equivalent arrangement provided disconnection will not prevent services required for safety being immediately available when the power supply is restored to normal operating conditions.

9.3 Services for habitability in paragraph 4 may be included in the load shedding or other equivalent arrangement.

3 SOLAS regulation II-1/41.1.2 Main source of electrical power

Those services necessary to provide normal operational conditions of propulsion and safety do not include services such as:

.1 thrusters not forming part of the main propulsion;
.2 moorings;
.3 cargo handling gear;
.4 cargo pumps; and
.5 refrigerators for air conditioning (those which are not necessary to establish a minimum condition of habitability).

4 SOLAS regulation II 1/41.1.3 Main source of electrical power – Shaft-driven generator systems

Generators and generator systems, having the ship's main propulsion machinery as their prime mover, may be accepted as part of the ship's main source of electrical power, provided:

1 They are to be capable of operating under all weather conditions during sailing and during manoeuvring, also when the vessel is stopped, within the specified limits for the voltage variation in IEC 60092 – 301 and the frequency variation in IACS UR E5.

2 Their rated capacity is safeguarded during all operations given under 1, and is such that in the event of any other one of the generators failing, the services given under regulation II-1/41.1.2 (Interpretation 3) can be maintained.

3 The short circuit current of the generator/generator system is sufficient to trip the generator/generator system circuit-breaker taking into account the selectivity of the protective devices for the distribution system.

Protection is to be arranged in order to safeguard the generator/generator system in case of a short circuit in the main bus bar. The generator/generator system is to be suitable for further use after fault clearance.

4 Standby sets are started in compliance with paragraph 2.2 of SOLAS chapter II-1, regulation II-1/41.5 (Interpretation 5).

5 SOLAS regulation II-1/41.5 Main source of electrical power

Interpretation of 41.5.1.1

1 Where the electrical power is normally supplied by more than one generator set simultaneously in parallel operation, provision of protection, including automatic disconnection of sufficient non-essential services and if necessary secondary essential services as defined in the unified interpretation of SOLAS II-1/40 and 41 above (Interpretation 2) and those provided for habitability, should be made to ensure that, in case of loss of any of these generating sets, the remaining ones are kept in operation to permit propulsion and steering and to ensure safety.

2 Where Administrations permit electrical power to be normally supplied by one generator provision shall be made, upon loss of power, for automatic starting and connecting to the main switchboard of stand-by generator(s) of sufficient capacity with automatic restarting of the essential auxiliaries, in sequential operation if required. Starting and connection to the main switchboard of one generator should be as rapid as possible, preferably within 30 seconds after loss of power. Where prime movers with longer starting time are used, this starting and connection time may be exceeded upon approval from the Administration.

Interpretation of 41.5.1.2

3 The load shedding should be automatic.

4 The non-essential services, service for habitable conditions, may be shed and, where necessary, additionally the secondary essential services, sufficient to ensure the connected generator set(s) is/are not overloaded.

6 SOLAS regulations II-1/42 and II-1/43 Emergency source of power in passenger and cargo ships

1 "Blackout" as used in regulations II-1/42.3.4 and II-1/43.3.4 is to be understood to mean a "deadship" condition initiating event.

2 "Deadship" condition, for the purpose of regulations II-1/42.3.4 and II-1/43.3.4, is to be understood to mean a condition under which the main propulsion plant, boilers and auxiliaries are not in operation and in restoring the propulsion, no stored energy for starting the propulsion plant, the main source of electrical power and other essential auxiliaries is to be assumed available. It is assumed that means are available to start the emergency generator at all times.

3 Emergency generator stored starting energy is not to be directly used for starting the propulsion plant, the main source of electrical power and/or other essential auxiliaries (emergency generator excluded).

4 For steam ships, the 30 minute time limit given in SOLAS can be interpreted as time from blackout defined above to light-off of the first boiler.

7 SOLAS chapter II-1 part B and B-1
Doors in watertight bulkheads of passenger ships and cargo ships

This interpretation pertains to doors[1] located in way of the internal watertight subdivision boundaries and the external watertight boundaries necessary to ensure compliance with the relevant subdivision and damage stability regulations.

This interpretation does not apply to doors located in external boundaries above equilibrium or intermediate waterplanes.

The design and testing requirements for watertight doors vary according to their location relative to the equilibrium waterplane or intermediate waterplane at any stage of assumed flooding.

1 DEFINITIONS

For the purpose of this interpretation the following definitions apply:

1.1 **Watertight:** Capable of preventing the passage of water in any direction under a design head. The design head for any part of a structure shall be determined by reference to its location relative to the bulkhead deck or freeboard deck, as applicable, or to the most unfavourable equilibrium/intermediate waterplane, in accordance with the applicable subdivision and damage stability regulations, whichever is the greater. A watertight door is thus one that will maintain the watertight integrity of the subdivision bulkhead in which it is located.

1.2 **Equilibrium waterplane:** The waterplane in still water when, taking account of flooding due to an assumed damage, the weight and buoyancy forces acting on a vessel are in balance. This relates to the final condition when no further flooding takes place or after cross flooding is completed.

1.3 **Intermediate waterplane:** The waterplane in still water, which represents the instantaneous floating position of a vessel at some intermediate stage between commencement and completion of flooding when, taking account of the assumed instantaneous state of flooding, the weight and buoyancy forces acting on a vessel are in balance.

1.4 **Sliding door or rolling door:** A door having a horizontal or vertical motion generally parallel to the plane of the door.

1.5 **Hinged door:** A door having a pivoting motion about one vertical or horizontal edge.

2 STRUCTURAL DESIGN

Doors and their frames shall be of approved design and substantial construction in accordance with the requirements of the Administration and shall preserve the strength of the subdivision bulkheads in which they are fitted.

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1 Doors in watertight bulkheads of small cargo ships, not subject to any statutory subdivision and damage stability requirements, may be hinged quick acting doors arranged to open out of the major space protected. They shall be constructed in accordance with the requirements of the Administration and have notices affixed to each side stating, “To be kept closed at sea”.

3 OPERATION MODE, LOCATION AND OUTFITTING

Doors shall be fitted in accordance with all requirements regarding their operation mode, location and outfitting, i.e. provision of controls, means of indication, etc., as shown in Table 1 below. This table is to be read in conjunction with paragraphs 3.1 to 5.4 below.

3.1 Frequency of use whilst at sea

3.1.1 **Normally closed**
Kept closed at sea but may be used if authorised. To be closed again after use.

3.1.2 **Permanently closed**
The time of opening such doors in port and of closing them before the ship leaves port shall be entered in the log-book. Should such doors be accessible during the voyage, they shall be fitted with a device to prevent unauthorised opening.

3.1.3 **Normally open**
May be left open provided it is always ready to be immediately closed.

3.1.4 **Used**
In regular use, may be left open provided it is ready to be immediately closed.

3.2 Type

Power operated, sliding or rolling[2]	POS
Power operated, hinged	POH
Sliding or rolling	S
Hinged	H

3.3 Control

3.3.1 Local

3.3.1.1 All doors, except those which are to be permanently closed at sea, are to be capable of being opened and closed by hand locally[3], from both sides of the doors, with the ship listed to either side.

3.3.1.2 For passenger ships, the angle of list at which operation by hand is to be possible is 15 degrees or 20 degrees if the ship is allowed to heel up to 20 degrees during intermediate stages of flooding.

3.3.1.3 For cargo ships, the angle of list at which operation by hand is to be possible is 30 degrees.

2 Rolling doors are technically identical to sliding doors.
3 Arrangements for passenger ships shall be in accordance with SOLAS regulation II-1/15.7.1.4.

3.3.2 Remote

Where indicated in Table 1, doors are to be capable of being remotely closed by power from the bridge[4]. Where it is necessary to start the power unit for operation of the watertight door, means to start the power unit is also to be provided at remote control stations. The operation of such remote control is to be in accordance with SOLAS regulations II-1/15.8.1 to 15.8.3.

3.4 Indication

3.4.1 Where shown in table 1, position indicators are to be provided at all remote operating positions[5] as well as locally, on both sides of the doors[6], to show whether the doors are open or closed and, if applicable, with all dogs/cleats fully and properly engaged.

3.4.2 The door position indicating system is to be of self-monitoring type and the means for testing of the indicating system are to be provided at the position where the indicators are fitted.

3.4.3 An indication (i.e. red light) should be placed locally showing that the door is in remote control mode ("doors closed mode"). Refer also to SOLAS regulation II-1/15-8.1. Special care should be taken in order to avoid potential danger when passing through the door. Signboard/instructions should be placed in way of the door advising how to act when the door is in "doors closed" mode.

3.5 Alarms

3.5.1 Doors which are to be capable of being remotely closed are to be provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever such a door is remotely closed. For passenger ships the alarm shall sound for at least 5 s but not more than 10 s before the door begins to move and shall continue sounding until the door is completely closed. In the case of remote closure by hand operation, an alarm is required to sound only while the door is actually moving.

3.5.2 In passenger areas and areas of high ambient noise, the audible alarms are to be supplemented by visual signals at both sides of the doors.

3.6 Notices

As shown in table 1, doors which are normally closed at sea, but are not provided with means of remote closure, are to have notices fixed to both sides of the doors stating: "To be kept closed at sea". Doors which are to be permanently closed at sea are to have notices fixed to both sides stating: "Not to be opened at sea".

3.7 Location

For passenger ships the watertight doors and their controls are to be located in compliance with SOLAS regulations II-1/15.6.3 and II-1/15.7.1.2.2.

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4 Arrangements for passenger ships shall be in accordance with SOLAS regulation II-1/15.7.1.5.
5 Indication at all remote control positions (SOLAS regulation II-1/15.6.4).
6 Refer to SOLAS regulation II-1/25-9.3.

4 FIRE DOORS

4.1 Watertight doors may also serve as fire doors but need not be fire-tested when intended for use below the bulkhead deck. Where such doors are used at locations above the bulkhead deck they shall, in addition to complying with the provisions applicable to fire doors at the same locations, also comply with means of escape provisions of SOLAS regulation II-2/13 (2000 SOLAS amendments, resolution MSC.99(73)).

4.2 Where a watertight door is located adjacent to a fire door, both doors shall be capable of independent operation, remotely if required by SOLAS regulations II-1/15.8.1 to 15.8.3 and from both sides of each door.

5 TESTING

5.1 Doors which become immersed by an equilibrium or intermediate waterplane, are to be subjected to a hydrostatic pressure test.

5.1.1 For large doors intended for use in the watertight subdivision boundaries of cargo spaces on cargo ships, structural analysis may be accepted in lieu of pressure testing such analysis should be to the satisfaction of the Administration. Where such doors utilise gasket seals, a prototype pressure test to confirm that the compression of the gasket material is capable of accommodating any deflection, revealed by the structural analysis, is to be carried out.

5.2 Doors above freeboard or bulkhead deck, which are not immersed by an equilibrium or intermediate waterplane but become intermittently immersed at angles of heel in the required range of positive stability beyond the equilibrium position are to be hose tested.

5.3 Pressure testing

5.3.1 The head of water used for the pressure test shall correspond at least to the head measured from the lower edge of the door opening, at the location in which the door is to be fitted in the vessel, to the bulkhead deck or freeboard deck, as applicable, or to the most unfavourable damage waterplane, if that be greater. Testing may be carried out at the factory or other shore based testing facility prior to installation in the ship.

5.3.2 Leakage criteria

5.3.2.1 The following acceptable leakage criteria should apply:

Doors with gaskets	No leakage
Doors with metallic sealing	Maximum leakage 1 litre/min

5.3.2.2 Limited leakage may be accepted for pressure tests on large doors located in cargo spaces employing gasket seals or guillotine doors located in conveyor tunnels, in accordance with the following[7]:

$$\text{Leakage rate (litre/min)} = \frac{(P+4.572)\, h^3}{6568}$$

where: P = perimeter of door opening (metres)
h = test head of water (metres)

5.3.2.3 However, in the case of doors where the water head taken for the determination of the scantling does not exceed 6.10 m, the leakage rate may be taken equal to 0.375 litre/min if this value is greater than that calculated by the above-mentioned formula.

5.3.3 For doors of passenger ships which are normally open and used at sea and which become submerged by the equilibrium or intermediate waterplane, a prototype test shall be conducted, on each side of the door, to check the satisfactory closing of the door against a force equivalent to a water height of at least 1m above the sill on the centre line of the door[8].

5.4 Hose testing after installation

All watertight doors shall be subject to a hose test[9] after installation in a ship. Hose testing is to be carried out from each side of a door unless, for a specific application, exposure to floodwater is anticipated only from one side. Where a hose test is not practicable because of possible damage to machinery, electrical equipment insulation, or outfitting items, it may be replaced by means such as an ultrasonic leak test or an equivalent test.

7 Published in the ATM F 1196, Standard Specification for Sliding Watertight Door Assemblies and referenced in the Title 46 US Code of Federal Regulations 170.270 Door design, operation installation and testing.
8 Arrangements for passenger ships shall be in accordance with SOLAS regulation II-1/15.6.2.
9 Refer to IACS URS 14.2.3 IACS Reg 1996/Rev.2 2001

Table 1
Internal doors in watertight bulkheads in cargo ships and passenger ships

Position relative to equilibrium or intermediate waterplane	1. Frequency of use whilst at sea	2. Type	3. Remote control[6]	4. Indication locally and on bridge[6]	5. Audible alarm[6]	6. Notice	7. Comments	8. Regulation
I. Passenger ships								
A. At or below	Normally closed	POS	Yes	Yes	Yes	No	Certain doors may be left open, see SOLAS II-1/15.9.3	SOLAS II-1/15.9.1, 15.9.2 and 15.9.3
	Permanently closed	S, H	No	No	No	Yes	See Notes 1 + 4	SOLAS II-1/15.10.1 and 15.10.2
B. Above	Normally open	POS, POH	Yes	Yes	Yes	No		SOLAS II-1/15.9.3 SOLAS II-1/20.1 MSC/Circ.541
	Normally closed	S, H	No	Yes	No	Yes	See Note 2	
		S, H	No	Yes	No	Yes	Doors giving access to ro-ro deck	SOLAS II-1/20-2
II. Cargo ships								
A. At or below	Used	POS	Yes	Yes	Yes	No		SOLAS II-1/25-9.2
	Normally closed	S, H	No	Yes	No	Yes	see Notes 2 + 3 + 5	SOLAS II-1/25-9.3
	Permanently closed	S, H	No	No	No	Yes	see Notes 1 + 4	SOLAS II-1/25-9.4 SOLAS II-1/25-10
B. Above	Used	POS	Yes	Yes	Yes	No		SOLAS II-1/25-9.2
	Normally closed	S, H	No	Yes	No	Yes	See Notes 2 + 5	SOLAS II-1/25-9.3 SOLAS II-1/25-10

Notes:
1. Doors in watertight bulkheads subdividing cargo spaces.
2. If hinged, this door shall be of quick acting or single action type
3. SOLAS requires remotely operated watertight doors to be sliding doors.
4. The time of opening such doors in port and closing them before the ship leaves port shall be entered in the logbook.
5. The use of such doors shall be authorised by the officer of the watch.
6. Cables for control and power systems to power operated watertight doors and their status indication should comply with the requirements of IACS UR E15.

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ANNEX 16

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATION OF THE GUIDELINESS FOR DESIGN, CONSTRUCTION AND OPERATION OF PASSENGER SUBMERSIBLE CRAFT

1 The Maritime Safety Committee, [at its seventy-ninth session (1 to 10 December 2004)], following the recommendations made by the Sub-Committee on Ship Design and Equipment at its forty-seventh session, approved the unified interpretation for the provision of paragraph 2.2.3 (Viewports in passenger submersible craft) of the IMO Guidelines for Design, Construction and Operation of Passenger Submersible Craft, 2000, as set out in the annex, with a view to ensuring a uniform approach towards the application of the above Guidelines.

2 Member Governments are invited to use the annexed interpretation when applying relevant provisions of the Guidelines for design, construction and operation of passenger submersible craft, 2000, and to bring it to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATION TO THE GUIDELINES FOR DESIGN, CONSTRUCTION AND OPERATION OF PASSENGER SUBMERSIBLE CRAFT, 2000

Guidelines for Design, Construction and Operation of Passenger Submersible Craft, 2000

Paragraph 2.2.3 - Viewports in passenger submersible craft

Acrylic viewports are to be designed, fabricated and maintained in accordance with the requirements of the latest edition of the American Society of Mechanical Engineers Safety Standard for Pressure Vessels for Human Occupancy (ASME PVHO), Section 2, Viewports and Section 3, Window Fabricators. Other standards and materials may be accepted by the Administration, provided they achieve an equivalent level of safety with respect to design, fabrication and maintenance.

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ANNEX 17

DRAFT REVISED SOLAS CHAPTER XII

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

CHAPTER XII

ADDITIONAL SAFETY MEASURES FOR BULK CARRIERS

The existing text of chapter XII is replaced by the following:

Regulation 1

Definitions

For the purpose of this chapter:

1 *Bulk carrier* means a ship which is intended primarily to carry dry cargo in bulk, including such types as ore carriers and combination carriers.[1]

2 *Bulk carrier of single-side skin construction* means a bulk carrier which is constructed generally with single deck, top-side tanks and hopper side tanks in cargo spaces, in which:

.1 any part of a cargo hold is bounded by the side shell; or

.2 where one or more cargo holds are bounded by two watertight boundaries, one of which is the side shell, which are less than 760 mm apart in bulk carriers constructed before 1 January 2000 and less than 1,000 mm apart in bulk carriers constructed on or after 1 January 2000, the distance being measured perpendicular to the side shell.

Such ships include combination carriers in which any part of a cargo hold is bounded by the side shell.

3 *Bulk carrier of double-side skin construction* means a bulk carrier as defined in paragraph 1, in which all cargo holds are bounded by a double-side skin.

4 *Double-side skin* means a configuration where each ship side is constructed by the side shell and a longitudinal bulkhead connecting the double bottom and the deck. Hopper side tanks and top-side tanks may, where fitted, be integral parts of the double-side skin configuration.

5 *Length* of a bulk carrier means the length as defined in the International Convention on Load Lines in force.

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1 Refer to the [Guidance for the identification of a ship as a bulk carrier] to be developed by the Organization. For ships constructed before [date of entry into force of the amendments], reference may be made to the 1997 SOLAS Conference resolution 6.

6 *Solid bulk cargo* 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 loaded directly into the cargo spaces of a ship without any intermediate form of containment.

7 *Bulk carrier bulkhead and double bottom strength standards* means "Standards for the evaluation of scantlings of the transverse water-tight vertically corrugated bulkhead between the two foremost cargo holds and for the evaluation of allowable hold loading of the foremost cargo hold" adopted by resolution 4 of the Conference of Contracting Governments to the International Convention for the Safety of Life at Sea, 1974 on 27 November 1997, 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.

8 *Bulk carriers constructed* means bulk carriers the keels of which are laid or which are at a similar stage of construction.

9 *A similar stage of construction* means the stage at which:

.1 construction identifiable with a specific ship begins; and

.2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

10 *Breadth* (B) of a bulk carrier means the breadth as defined in the International Convention on Load Lines in force.

Regulation 2

Application[2]

Bulk carriers shall comply with the requirements of this chapter in addition to the applicable requirements of other chapters.

Regulation 3

Implementation schedule

Bulk carriers constructed before 1 July 1999 to which regulations 4 or 6 apply shall comply with the provisions of such regulations according to the following schedule, with reference to the enhanced programme of inspections required by regulation XI/2:

2 Refer to the Interpretation of the provisions of SOLAS chapter XII on Additional safety measures for bulk carriers, adopted by the Maritime Safety Committee of the Organization by resolution MSC.79(70) and the application provisions of Annex 1 to the Interpretation of the provisions of SOLAS chapter XII on Additional safety measures for bulk carriers, adopted by the Maritime Safety Committee of the Organization by resolution MSC.89(71). Refer also to the [Guidance for the identification of a ship as a bulk carrier] to be developed by the Organization.

.1 bulk carriers, which are 20 years of age and over on 1 July 1999, by the date of the first intermediate survey or the first periodical survey after 1 July 1999, whichever comes first;

.2 bulk carriers, which are 15 years of age and over but less than 20 years of age on 1 July 1999, by the date of the first periodical survey after 1 July 1999, but not later than 1 July 2002; and

.3 bulk carriers, which are less than 15 years of age on 1 July 1999, by the date of the first periodical survey after the date on which the ship reaches 15 years of age, but not later than the date on which the ship reaches 17 years of age.

Regulation 4

Damage stability requirements applicable to bulk carriers

1 Bulk carriers of 150 m in length and upwards of single-side skin construction, designed to carry solid bulk cargoes having a density of 1000 kg/m^3 and above, constructed on or after 1 July 1999 shall, when loaded to the summer load line, be able to withstand flooding of any one cargo hold in all loading conditions and remain afloat in a satisfactory condition of equilibrium, as specified in paragraph 4.

2 Bulk carriers of 150 m in length and upwards of double-side skin construction with a double-side skin space less than B/5 wide, designed to carry solid bulk cargoes having a density of 1000 kg/m^3 and above, constructed on or after [date of entry into force of the amendment] shall, when loaded to the summer load line, be able to withstand flooding of any one cargo hold in all loading conditions and remain afloat in a satisfactory condition of equilibrium, as specified in paragraph 4.

3 Bulk carriers of 150 m in length and upwards of single-side skin construction, carrying solid bulk cargoes having a density of 1,780 kg/m^3 and above, constructed before 1 July 1999 shall, when loaded to the summer load line, be able to withstand flooding of the foremost cargo hold in all loading conditions and remain afloat in a satisfactory condition of equilibrium, as specified in paragraph 4. This requirement shall be complied with in accordance with the implementation schedule specified in regulation 3.

4 Subject to the provisions of paragraph 7, the condition of equilibrium after flooding shall satisfy the condition of equilibrium laid down in the annex to resolution A.320(IX) - Regulation equivalent to regulation 27 of the International Convention on Load Lines, 1966, as amended by resolution A.514(13). The assumed flooding need only take into account flooding of the cargo hold space to the water level outside the ship in that flooded condition. The permeability of a loaded hold shall be assumed as 0.9 and the permeability of an empty hold shall be assumed as 0.95, unless a permeability relevant to a particular cargo is assumed for the volume of a flooded hold occupied by cargo and a permeability of 0.95 is assumed for the remaining empty volume of the hold.

5 Bulk carriers constructed before 1 July 1999, which have been assigned a reduced freeboard in compliance with regulation 27(7) of the International Convention on Load Lines, 1966, as adopted on 5 April 1966, may be considered as complying with paragraph 3 of this regulation.

6 Bulk carriers which have been assigned a reduced freeboard in compliance with the provisions of paragraph (8) of the regulation equivalent to regulation 27 of the International Convention on Load Lines, 1966, adopted by resolution A.320(IX), as amended by resolution A.514(13), may be considered as complying with paragraphs 1 or 2, as appropriate.

7 On bulk carriers which have been assigned reduced freeboard in compliance with the provisions of regulation 27(8) of Annex B of the Protocol of 1988 relating to the International Convention on Load Lines, 1966, the condition of equilibrium after flooding shall satisfy the relevant provisions of that Protocol.

Regulation 5

Structural strength of bulk carriers

1 Bulk carriers of 150 m in length and upwards of single-side skin construction, designed to carry solid bulk cargoes having a density of 1,000 kg/m^3 and above constructed on or after 1 July 1999, shall have sufficient strength to withstand flooding of any one cargo hold to the water level outside the ship in that flooded condition in all loading and ballast conditions, taking also into account dynamic effects resulting from the presence of water in the hold, and taking into account the recommendations adopted by the Organization.[3]

2 Bulk carriers of 150 m in length and upwards of double-side skin construction, with a double-side skin space less than B/5 wide, designed to carry bulk cargoes having a density of 1,000 kg/m^3 and above constructed on or after [date of entry into force of the amendment], shall comply with the structural strength provisions of paragraph 1.

Regulation 6

Structural and other requirements for bulk carriers

1 Bulk carriers of 150 m in length and upwards of single-side skin construction, carrying solid bulk cargoes having a density of 1780 kg/m^3 and above, constructed before 1 July 1999, shall comply with the following requirements in accordance with the implementation schedule specified in regulation 3:

3 Refer to resolution 3, Recommendation on compliance with SOLAS regulation XII/5, adopted by the 1997 SOLAS Conference.

.1 The transverse watertight bulkhead between the two foremost cargo holds and the double bottom of the foremost cargo hold shall have sufficient strength to withstand flooding of the foremost cargo hold, taking also into account dynamic effects resulting from the presence of water in the hold, in compliance with the Bulk carrier bulkhead and double bottom strength standards. For the purpose of this regulation, the Bulk carrier bulkhead and double bottom strength standards shall be treated as mandatory.

.2 In considering the need for, and the extent of, strengthening of the transverse watertight bulkhead or double bottom to meet the requirements of 1.1, the following restrictions may be taken into account:

.1 restrictions on the distribution of the total cargo weight between the cargo holds; and

.2 restrictions on the maximum deadweight.

.3 For bulk carriers using either of, or both, the restrictions given in 1.2.1 and 1.2.2 above for the purpose of fulfilling the requirements of 1.1, these restrictions shall be complied with whenever solid bulk cargoes having a density of 1,780 kg/m^3 and above are carried.

2 Bulk carriers of 150 m in length and upwards carrying solid bulk cargoes having a density of 1,000 kg/m^3 and above constructed on or after [date of entry into force of the amendment] shall be of double-side skin construction, in compliance with paragraph 3 of this regulation.

3 Bulk carriers of 150 m in length and upwards of double-side skin construction, constructed on or after [date of entry into force of the amendment] shall comply with the following requirements:

.1 Primary stiffening structures of the double-side skin shall not be placed inside the cargo hold space.

.2 Subject to the provisions below, the distance between the outer shell and the inner shell at any transverse section shall not be less than 1,000 mm measured perpendicular to the side shell. The double-side skin construction shall be wide enough to allow access for inspection as provided in regulation II-1/3-6 and the Technical Provisions referring thereto.

.1 The clearances below need not be maintained in way of cross ties, upper and lower end brackets of transverse framing or end brackets of longitudinal framing.

.2 The minimum width of the clear passage through the double-side skin space in way of obstructions such as piping or vertical ladders shall not be less than 600 mm.

.3 Where the inner and/or outer skins are transversely framed, the minimum clearance between the inner surfaces of the frames shall not be less than 600 mm.

.4 Where the inner and outer skins are longitudinally framed, the minimum clearance between the inner surfaces of the frames shall not be less than 800 mm. Outside the parallel part of the cargo hold length, this clearance may be reduced where necessitated by the structural configuration but in no case shall be less than 600 mm.

.5 The minimum clearance referred to above shall be the shortest distance measured between assumed lines connecting the inner surfaces of the frames on the inner and outer skins.

4 The double-side skin spaces shall be coated in accordance with the requirements of regulation II-1/3-2 and the [Performance standards for coatings][4] adopted by 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.

5 The double-side skin spaces, with the exception of top-side wing tanks, if fitted, shall not be used for the carriage of cargo.

Regulation 7

Survey and maintenance of bulk carriers

1 Bulk carriers of 150 m in length and upwards of single-side skin construction, constructed before 1 July 1999, of 10 years of age and over, shall not carry solid bulk cargoes having a density of 1,780 kg/m^3 and above unless they have satisfactorily undergone either:

.1 a periodical survey, in accordance with the enhanced programme of inspections required by regulation XI/2, or

.2 a survey of all cargo holds to the same extent as required for periodical surveys in the enhanced survey programme of inspections required by regulation XI/2.

2 Bulk carriers shall comply with the maintenance requirements provided in regulation II-1/3-1 and the [standards for owners' inspections and maintenance of bulk carrier hatch covers][5] adopted by 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.

4 Performance standards for coatings to be developed by the Organization.
5 Standards for owners' inspections and maintenance of bulk carrier hatch covers being developed by the Organization.

Regulation 8

Information on compliance with requirements for bulk carriers

1 The booklet required by regulation VI/7.2 shall be endorsed by the Administration or on its behalf, to indicate that regulations 4, 5, 6 and 7, as appropriate, are complied with.

2 Any restrictions imposed on the carriage of solid bulk cargoes having a density of 1,780 kg/m^3 and above in accordance with the requirements of regulation 6 shall be identified and recorded in the booklet referred to in paragraph 1.

3 A bulk carrier to which paragraph 2 applies shall be permanently marked on the side shell at midships, port and starboard, with a solid equilateral triangle having sides of 500 mm and its apex 300 mm below the deck line, and painted a contrasting colour to that of the hull.

Regulation 9

Requirements for bulk carriers not being capable of complying with Regulation 4.3 due to the design configuration of their cargo holds

For bulk carriers constructed before 1 July 1999 being within the application limits of regulation 4.3, which have been constructed with an insufficient number of transverse watertight bulkheads to satisfy that regulation, the Administration may allow relaxation from the application of regulations 4.3 and 6 on condition that they shall comply with the following requirements:

.1 for the foremost cargo hold, the inspections prescribed for the annual survey in the enhanced programme of inspections required by regulation XI/2 shall be replaced by the inspections prescribed therein for the intermediate survey of cargo holds;

.2 are provided with bilge well high water level alarms in all cargo holds, or in cargo conveyor tunnels, as appropriate, giving an audible and visual alarm on the navigation bridge, as approved by the Administration or an organization recognized by it in accordance with the provisions of regulation XI/1; and

.3 are provided with detailed information on specific cargo hold flooding scenarios. This information shall be accompanied by detailed instructions on evacuation preparedness under the provisions of Section 8 of the International Safety Management (ISM) Code and be used as the basis for crew training and drills.

Regulation 10

Solid bulk cargo density declaration

1 Prior to loading bulk cargo on bulk carriers of 150 m and above, the shipper shall declare the density of the cargo, in addition to providing the cargo information required by regulation VI/2.

2 For bulk carriers to which regulation 6 applies, unless such bulk carriers comply with all relevant requirements of this chapter applicable to the carriage of solid bulk cargoes having a density of 1,780 kg/m^3 and above, any cargo declared to have a density within the range 1,250 kg/m^3 to 1,780 kgm/m^3 shall have its density verified by an accredited testing organization.[6]

Regulation 11

Loading instrument

(Unless provided otherwise, this regulation applies to bulk carriers regardless of their date of construction)

1 Bulk carriers of 150 m in length and upwards shall be fitted with a loading instrument capable of providing information on hull girder shear forces and bending moments, taking into account the recommendation adopted by the Organization.[7]

2 Bulk carriers of 150 m in length and upwards constructed before 1 July 1999 shall comply with the requirements of paragraph 1 not later than the date of the first intermediate or periodical survey of the ship to be carried out after 1 July 1999.

3 Bulk carriers of less than 150 m in length constructed on or after [date of entry into force of the amendment] shall be fitted with a loading instrument capable of providing information on the ship's stability in the intact condition. The computer software shall be approved for stability calculations by the Administration and shall be provided with standard conditions for testing purposes relating to the approved stability information.[8]

Regulation 12

Hold, ballast and dry space water ingress alarms

(This regulation applies to bulk carriers regardless of their date of construction)

1 Bulk carriers shall be fitted with water level detectors:

.1 in each cargo hold, giving audible and visual alarms, one when the water level above the inner bottom in any hold reaches a height of 0.5 m and another at a height not less than 15% of the depth of the cargo hold but not more than 2 m. On bulk carriers to which regulation 9.2 applies, detectors with only the latter alarm need be installed. The water level detectors shall be fitted in the aft end of the cargo holds. For cargo holds which are used for water ballast, an alarm overriding device may be installed. The visual alarms shall clearly discriminate between the two different water levels detected in each hold;

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6 In verifying the density of solid bulk cargoes, reference should be made to MSC/Circ.908, Uniform method of measurement of the density of bulk cargoes.

7 Refer to resolution 5, Recommendation on loading instruments, adopted by the 1997 SOLAS Conference.

8 Refer to the relevant parts of the appendix to the annex to MSC/Circ.891, Guidelines for the on-board use and application of computers.

.2 in any ballast tank forward of the collision bulkhead required by regulation II-1/11, giving an audible and visual alarm when the liquid in the tank reaches a level not exceeding 10% of the tank capacity. An alarm overriding device may be installed to be activated when the tank is in use; and

.3 in any dry or void space other than a chain cable locker, any part of which extends forward of the foremost cargo hold, giving an audible and visual alarm at a water level of 0.1 m above the deck. Such alarms need not be provided in enclosed spaces the volume of which does not exceed 0.1% of the ship's maximum displacement volume.

2 The audible and visual alarms specified in paragraph 1 shall be located on the navigation bridge.

3 Bulk carriers constructed before 1 July 2004 shall comply with the requirements of this regulation not later than the date of the annual, intermediate or renewal survey of the ship to be carried out after 1 July 2004, whichever comes first.

Regulation 13

Availability of pumping systems[9]

(This regulation applies to bulk carriers regardless of their date of construction)

1 On bulk carriers, the means for draining and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces any part of which extends forward of the foremost cargo hold shall be capable of being brought into operation from a readily accessible enclosed space, the location of which is accessible from the navigation bridge or propulsion machinery control position without traversing exposed freeboard or superstructure decks. Where pipes serving such tanks or bilges pierce the collision bulkhead, valve operation by means of remotely operated actuators may be accepted, as an alternative to the valve control specified in regulation II-1/11.4, provided that the location of such valve controls complies with this regulation.

2 Bulk carriers constructed before 1 July 2004 shall comply with the requirements of this regulation not later than the date of the first intermediate or renewal survey of the ship to be carried out after 1 July 2004, but in no case later than 1 July 2007.

9 Refer to MSC/Circ.1069, Interpretation of SOLAS regulation XII/13.

Regulation 14

Restrictions from sailing with any hold empty

Bulk carriers of 150 m in length and upwards of single-side skin construction, carrying cargoes having a density of 1780 kg/m^3 and above, if not meeting the requirements of regulation 5.1 and the [standards and criteria][10] adopted by 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, shall not sail with any hold loaded to less than 10% of the hold's maximum allowable cargo weight when in the full load condition, after reaching 10 years of age. The applicable full load condition for this regulation is a load equal to or greater than 90% of the ship's deadweight at the relevant assigned freeboard.

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10 Standards and criteria for side structures of bulk carriers of single-side skin construction being developed by the Organization.

ANNEX 18

DRAFT RESOLUTION MSC.[..(..)]
(adopted on ……..)

STANDARDS AND CRITERIA FOR SIDE STRUCTURES OF BULK CARRIERS OF SINGLE-SIDE SKIN CONSTRUCTION

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO SOLAS chapter XII on Additional safety measures for bulk carriers, which the 1997 SOLAS Conference adopted with the aim of enhancing the safety of ships carrying solid bulk cargoes,

RECALLING FURTHER that, having recognized the need to further improve the safety of bulk carriers in all aspects of their design, construction, equipment and operation, it examined the results of various formal safety assessment (FSA) studies on bulk carrier safety,

RECOGNIZING that, on the basis of the outcome of the aforementioned FSA studies, banning of alternate hold loading of heavy cargoes in full load condition for bulk carriers of single-side skin construction not meeting appropriate side structural strength requirements would contribute to improving the safety of these ships by reduction of shear forces and bending moments,

HAVING APPROVED, with a view to adoption, draft SOLAS regulation XII/14 – Restrictions from sailing with any hold empty, where reference is made to mandatory standards and criteria which a bulk carrier has to comply with in order to avoid the above-mentioned restrictions,

ACKNOWLEDGING that the International Association of Classification Societies (IACS) has issued the following relevant Unified Requirements:

S12 Rev.2.1 - Side structure in Single Side Skin Bulk Carriers; and

S31 - Renewal criteria for side shell frames in single side skin bulk carriers not built in accordance with UR S12 Rev.1 or subsequent revisions,

CONSIDERING that the above IACS Unified Requirements embody respectively the standards and criteria necessary to ascertain whether SOLAS regulation XII/14 should apply to a particular bulk carrier, and, therefore, should form the basis of the said standards and criteria,

HAVING CONSIDERED the recommendation made by the Sub-Committee on Ship Design and Equipment at its forty-seventh session,

1. ADOPTS, for the purposes of the application of SOLAS regulation XII/14:

.1 the Standards for side structures in single-side skin bulk carriers, set out in Annex 1 to the present resolution; and

.2 the Renewal criteria for side shell frames and brackets in single-side skin bulk carriers not built in accordance with the Standards for side structures in single-side skin bulk carriers, set out in Annex 2 to the present resolution;

2. URGES Governments to ensure that the annexed Standards or Renewal criteria are utilized, as appropriate, when deciding whether to apply the restrictions envisaged in SOLAS regulation XII/14 to bulk carriers of single-side skin construction.

ANNEX 1

STANDARDS FOR SIDE STRUCTURES IN SINGLE-SIDE SKIN BULK CARRIERS

1 Application

For the purpose of SOLAS regulation XII/14, these requirements define the minimum required standards for not being subject to restrictions from sailing with any hold empty for the side structures within the cargo area of single-side skin bulk carriers of 150 m in length and upwards carrying solid bulk cargoes having a density of 1, 780 kg/m³ and above.

2 Scantlings of side structures

2.1 The thickness of the side shell plating and the section modulus and shear area of side frames are to be determined according to the criteria of a classification society which is recognized by the Administration in accordance with the provisions of regulation XI/1, or with applicable national standards of the Administration which provide an equivalent level of safety.

2.2 The scantlings of side hold frames immediately adjacent to the collision bulkhead are to be increased in order to prevent excessive imposed deformation on the shell plating. As an alternative, supporting structures are to be fitted which maintain the continuity of forepeak stringers within the foremost hold.

3 Minimum thickness of frame webs

The thickness of frame webs within the cargo area is not to be less than $t_{w,min}$, in mm, given by:

$$t_{w,\min} = C(7{,}0 + 0{,}03 \cdot L)$$

where:

C = 1,15 for the frame webs in way of the foremost hold;
1,0 for the frame webs in way of other holds.

L = the distance, in metres, on the summer load waterline from the fore side of stem to the after side of the rudder post, or the centre of the rudder stock if there is no rudder post. L is not to be less than 96%, and need not be greater than 97%, of the extreme length on the summer load waterline but need not be taken greater than 200 m.

4 Lower and upper brackets

4.1 The thickness of the frame lower brackets is not to be less than the greater of t_w and $t_{w,min} + 2$ mm, where t_w is the fitted thickness of the side frame web. The thickness of the frame upper bracket is not to be less than the greater of t_w and $t_{w,min}$.

4.2 The section modulus SM of the frame and bracket or integral bracket, and associated shell plating, at the locations shown in Figure 1, is not to be less than twice the section modulus SMF required for the frame midspan area.

4.3 The dimensions of the lower and upper brackets are not to be less than those shown in Figure 2.

4.4 Structural continuity with the upper and lower end connections of side frames is to be ensured within topsides and hopper tanks by connecting brackets as shown in Figure 3. The brackets are to be stiffened against buckling according to the criteria of a classification society which is recognized by the Administration in accordance with the provisions of regulation XI/1, or with applicable national standards of the Administration which provide an equivalent level of safety.

4.5 The section moduli of the side longitudinals and sloping bulkhead longitudinals which support the connecting brackets are to be determined with the span taken between transverses according to the requirements of a classification society which is recognized by the Administration in accordance with the provisions of regulation XI/1, or with applicable national standards of the Administration which provide an equivalent level of safety. In these cases, the section moduli of the side longitudinals and sloping bulkhead longitudinals are to be determined according to the applicable criteria for the purpose of effectively supporting the brackets.

5 Side frame sections

5.1 Frames are to be fabricated symmetrical sections with integral upper and lower brackets and are to be arranged with soft toes.

5.2 The side frame flange is to be curved (not knuckled) at the connection with the end brackets. The radius of curvature is not to be less than r, in mm, given by:

$$r = \frac{0{,}4 \cdot b_f^2}{t_f}$$

where b_f and t_f are the flange width and thickness of the brackets, respectively, in mm. The end of the flange is to be sniped.

5.3 In ships less than 190 m in length, mild steel frames may be asymmetric and fitted with separate brackets. The face plate or flange of the bracket is to be sniped at both ends. Brackets are to be arranged with soft toes.

5.4 The frame web thickness ratio of frames is not to exceed the following values:

- 60 $k^{0,5}$ for symmetrically flanged frames
- 50 $k^{0,5}$ for asymmetrically flanged frames

where
k = 1,0 for ordinary hull structural steel
k = 0,78 for steel with yield stress of 315 N/mm² and
k = 0,72 for steel with yield stress of 355 N/mm².
The outstanding flange is not to exceed 10 $k^{0,5}$ times the net flange thickness.

6 Tripping brackets

In way of the foremost hold side frames of asymmetrical section are to be fitted with tripping brackets at every two frames, as shown in Figure 4.

7 Weld connections of frames and end brackets

7.1 Double continuous welding is to be adopted for the connections of frames and brackets to side shell and hopper and upper wing tank plating and web to face plates.

7.2 For this purpose, the weld throat is to be (see Figure 1):

- 0,44 t in zone “a”
- 0,4 t in zone “b”

where t is the thinner of the two connected members.

7.3 Where the hull form is such to prohibit an effective fillet weld, edge preparation of the web of frame and bracket may be required, in order to ensure the same efficiency as the weld connection stated above.

8 Minimum net thickness of side shell plating

The thickness of side shell plating located between the hopper and top wing tank is not to be less than $t_{p,min}$ in mm, given by:

$$t_{p,\min} = \sqrt{L}$$

Figure 1

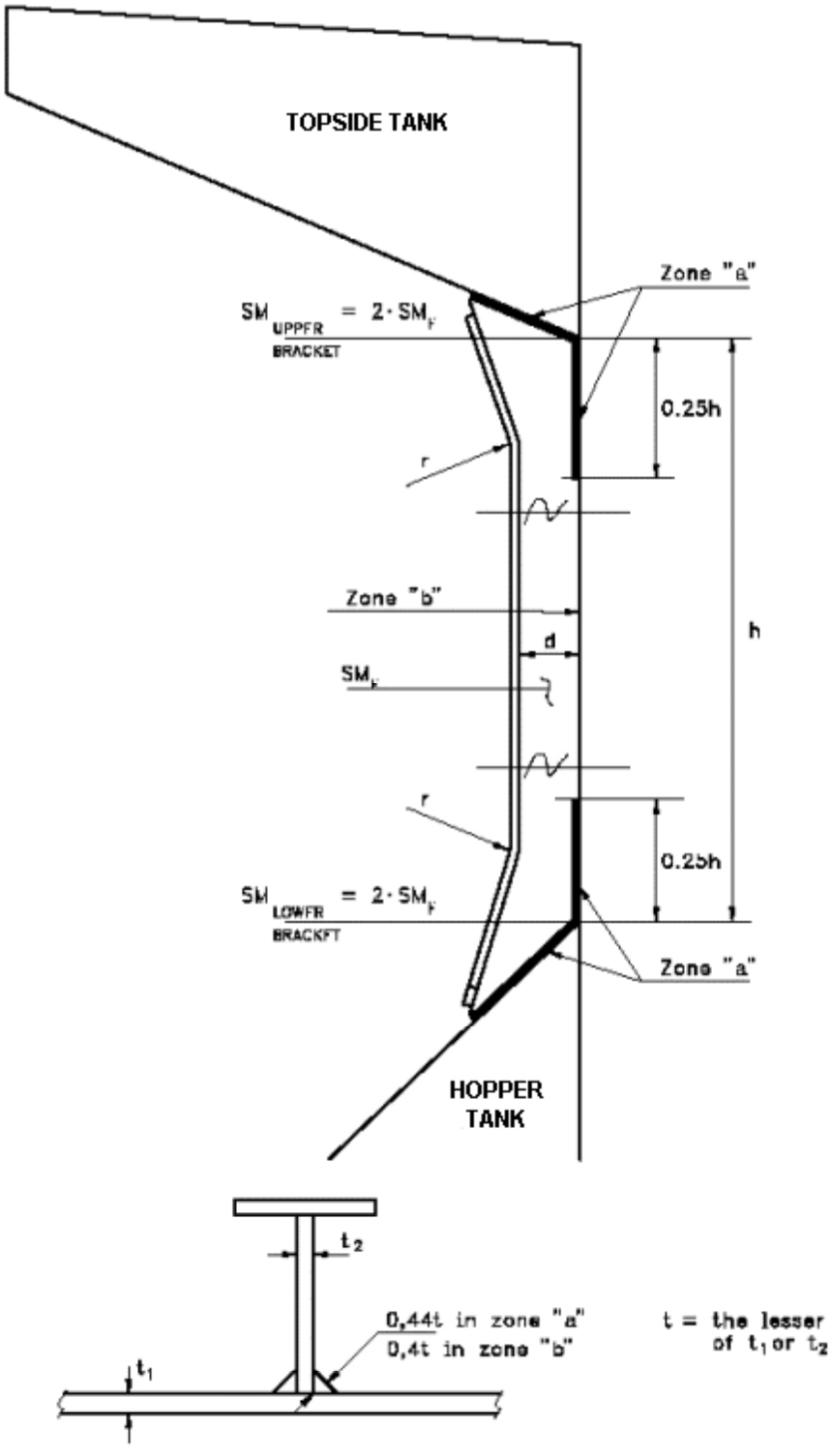

TOPSIDE TANK
Zone "a"
SM UPPER BRACKET = 2·SM
0.25h
r
Zone "b"
d
h
SM
r
0.25h
SM LOWER BRACKET = 2·SM
Zone "a"
HOPPER TANK
t2
0,44t in zone "a"
0,4t in zone "b"
t = the lesser of t1 or t2
t1

Figure 2

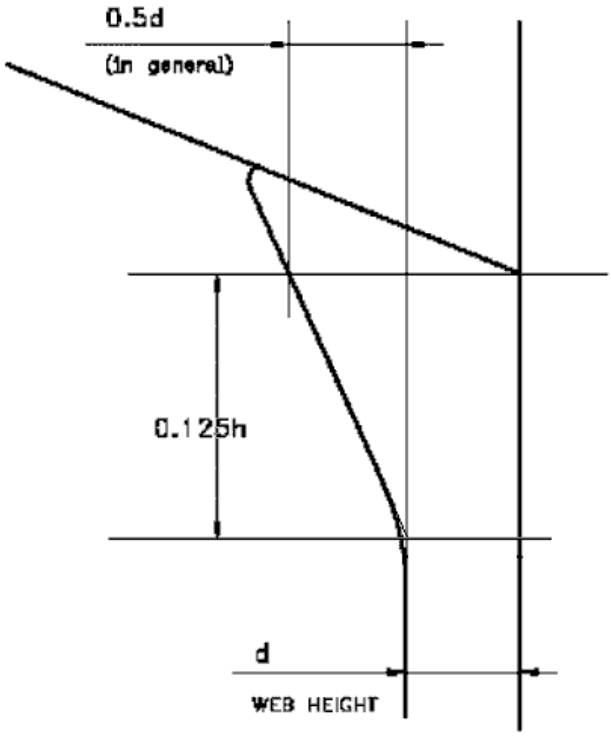


Figure 3

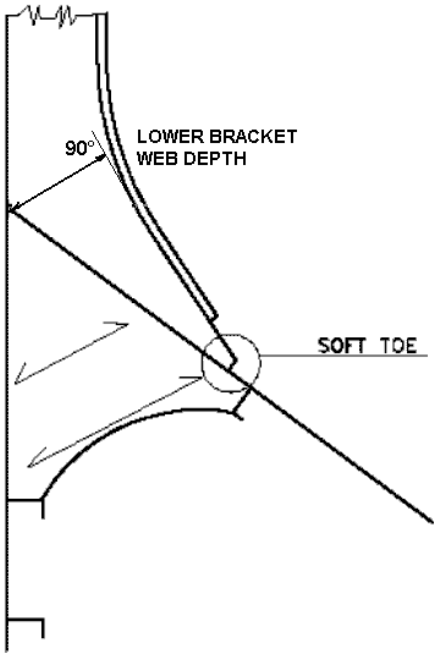
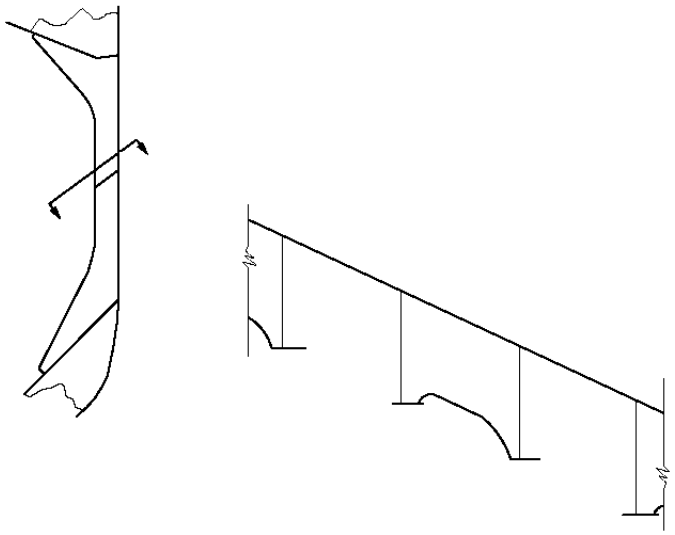


Figure 4 - Tripping brackets to be fitted in way of foremost hold



ANNEX 2

RENEWAL CRITERIA FOR SIDE SHELL FRAMES AND BRACKETS IN SINGLE-SIDE SKIN BULK CARRIERS NOT BUILT IN ACCORDANCE WITH THE "STANDARDS FOR SIDE STRUCTURES IN SINGLE-SIDE SKIN BULK CARRIERS"

1 Application and definitions

For the purpose of SOLAS regulation XII/14, these requirements apply to the side shell frames and brackets of cargo holds in single-side skin bulk carriers, which were not built in accordance with annex 1, but shall achieve an equivalent level of safety for not being subject to restrictions when sailing with any hold empty.

These requirements define steel renewal criteria or other measures to be taken for the webs and flanges of side shell frames and brackets as per paragraph 2.

Reinforcing measures of side frames are also defined as per 2.3.

Finite element or other numerical analysis or direct calculation procedures cannot be used as an alternative to compliance with the requirements of this annex, except in cases off unusual side structure arrangements or framing to which the requirements of this annex cannot be directly applied.

1.1 Ice strengthened ships

1.1.1 Where bulk carriers are reinforced to comply with an ice class notation, the intermediate frames are not to be included when considering compliance with this annex.

1.1.2 The renewal thicknesses for the additional structure required to meet the ice strengthening notation are to be based on the class society's requirements.

1.1.3 If the ice class notation is requested to be withdrawn, the additional ice strengthening structure, with the exception of tripping brackets (see 2.1.2.1.b and 2.3), is not to be considered to contribute to compliance with annex 2.

2 Renewal or other measures

2.1 Criteria for renewal or other measures

2.1.1 Symbols used in 2.1

t_M = thickness as measured, in mm
t_{REN} = thickness at which renewal is required. See 2.1.2
$t_{REN,d/t}$ = thickness criteria based on d/t ratio. See 2.1.2.1
$t_{REN,S}$ = thickness criteria based on strength. See 2.1.2.2
t_{COAT} = 0.75 t_{S12}
t_{S12} = thickness in mm as required by annex 1 in paragraph 3 for frame webs and in paragraph 4 for upper and lower brackets
t_{AB} = thickness as built, in mm
t_C = See Table 1 below

Table 1 - t_C values, in mm

Ship's length L, in m	Holds other than No. 1		Hold No. 1	
	Span and upper brackets	Lower brackets	Span and upper brackets	Lower brackets
100	2,0	2,5	2,0	3,0
150	2,0	3,0	3,0	3,5
≥ 200	2,0	3,0	3,0	4,0
Note: For intermediate ship lengths, t_C is obtained by linear interpolation between the above values.				

2.1.2 Criteria for webs (Shear and other checks)

The webs of side shell frames and brackets are to be renewed when the measured thickness (t_M) is equal to or less than the thickness (t_{REN}) as defined below:
t_{REN} is the greatest of:

(a) $t_{COAT} - t_C$
(b) 0,75 t_{AB}
(c) $t_{REN,d/t}$
(d) $t_{REN,S}$ (where required by 2.1.2.2))

2.1.2.1 Thickness criteria based on d/t ratio

Subject to *b)* and *c*) below, $t_{REN,d/t}$ is given by the following equation:
$t_{REN,d/t}$ = (web depth in mm)/R
where:

R = for frames
65 $k^{0.5}$ for symmetrically flanged frames
55 $k^{0.5}$ for asymmetrically flanged frames
for lower brackets (see *a)* below):
87 $k^{0.5}$ for symmetrically flanged frames
73 $k^{0.5}$ for asymmetrically flanged frames

k = 1.0 for ordinary hull structural steel,
k = 0.78 for steel with yield stress of 315 N/mm² and
k = 0.72 for steel with yield stress of 355 N/mm².

In no instance is $t_{REN,d/t}$ for lower integral brackets to be taken as less than $t_{REN,d/t}$ for the frames they support.

a) Lower brackets

In calculating the web depth of the lower brackets, the following will apply:

- The web depth of lower bracket may be measured from the intersection of the sloped bulkhead of the hopper tank and the side shell plate, perpendicularly to the face plate of the lower bracket (see Figure 3).

- Where stiffeners are fitted on the lower bracket plate, the web depth may be taken as the distance between the side shell and the stiffener, between the stiffeners or between the outermost stiffener and the face plate of the brackets, whichever is the greatest.

b) Tripping bracket alternative

When t_M is less than $t_{REN,d/t}$ at section b) of the side frames, tripping brackets in accordance with 2.3 may be fitted as an alternative to the requirements for the web depth to thickness ratio of side frames, in which case $t_{REN,d/t}$ may be disregarded in the determination of t_{REN} in accordance with 2.1.2.

c) Immediately abaft collision bulkhead

For the side frames located immediately abaft the collision bulkheads, whose scantlings are increased in order that their moment of inertia is such to avoid undesirable flexibility of the side shell, when their web as built thickness t_{AB} is greater than $1{,}65.t_{REN,S}$, the thickness $t_{REN,d/t}$ may be taken as the value $t'_{REN,d/t}$ obtained from the following equation:

$$t'_{REN,d/t} = \sqrt[3]{t_{REN,d/t}^{\ 2}\ t_{REN,S}}$$

where $t_{REN,S}$ is obtained from 3.3.

2.1.2.2 Thickness criteria based on shear strength check

Where t_M in the lower part of side frames, as defined in Figure 1, is equal to or less than t_{COAT}, $t_{REN,S}$ is to be determined in accordance with 3.3.

2.1.2.3 Thickness of renewed webs of frames and lower brackets

Where steel renewal is required, the renewed webs are to be of a thickness not less than t_{AB}, $1{,}2t_{COAT}$ or $1{,}2t_{REN}$, whichever is the greatest.

2.1.2.4 Criteria for other measures

When $t_{REN} < t_M \leq t_{COAT}$, measures are to be taken, consisting of all the following:

a) sand blasting, or equivalent, and coating (see 2.2),

b) fitting tripping brackets (see 2.3), when the above condition occurs for any of the side frame zones A, B, C and D, shown in Figure 1, and

c) maintaining the coating in "as-new" condition (i.e. without breakdown or rusting) at Special and Intermediate Surveys.

The above measures may be waived if the structural members show no thickness diminution with respect to the as built thicknesses and coating is in "as-new" condition (i.e. without breakdown or rusting).

2.1.3 Criteria for frames and brackets (Bending check)

Where the length or depth of the lower bracket does not meet the requirements in annex 1, a bending strength check in accordance with 3.4 is to be carried out and renewals or reinforcements of frames and/or brackets effected as required therein.

2.2 Thickness measurements, steel renewal, sand blasting and coating

For the purpose of steel renewal, sand blasting and coating, four zones A, B, C and D are defined, as shown in Figure 1.

Representative thickness measurements are to be taken for each zone and are to be assessed against the criteria in 2.1.

In case of integral brackets, when the criteria in 2.1 are not satisfied for zone A or B, steel renewal, sand blasting and coating, as applicable, are to be done for both zones A and B.

In case of separate brackets, when the criteria in 2.1 are not satisfied for zone A or B, steel renewal, sand blasting and coating is to be done for each one of these zones, as applicable.

When steel renewal is required for zone C according to 2.1, it is to be done for both zones B and C. When sand blasting and coating is required for zone C according to 2.1, it is to be done for zones B, C and D.

When steel renewal is required for zone D according to 2.1, it needs only to be done for this zone. When sand blasting and coating is required for zone D according to 2.1, it is to be done for both zones C and D.

Special consideration may be given to zones previously renewed or re-coated, if found in "as-new" condition (i.e., without breakdown or rusting) by a classification society which is recognized by the Administration in accordance with the provisions of regulation XI/1.

When adopted, on the basis of the renewal thickness criteria in 2.1, in general coating is to be applied in compliance with the requirements of the organization, as applicable.

Where, according to the requirements in 2.1, a limited number of side frames and brackets are shown to require coating over part of their length, the following criteria apply.

a) The part to be coated includes:

- the web and the face plate of the side frames and brackets,

- the hold surface of side shell, hopper tank and topside tank plating, as applicable, over a width not less than 100 mm from the web of the side frame.

b) Epoxy coating or equivalent is to be applied.

In all cases, all the surfaces to be coated are to be sand blasted prior to coating application.

2.3 Reinforcing measures

Reinforcing measures are constituted by tripping brackets, located at the lower part and at midspan of side frames (see Figure 4). Tripping brackets may be located at every two frames, but lower and midspan brackets are to be fitted in line between alternate pairs of frames.

The thickness of the tripping brackets is to be not less than the as-built thickness of the side frame webs to which they are connected.

Double continuous welding is to be adopted for the connections of tripping brackets to the side shell frames and shell plating.

2.4 Weld throat thickness

In case of steel renewal the welded connections are to comply with paragraph 7 of annex 1.

2.5 Pitting and grooving

If pitting intensity is higher than 15% in area (see Figure 5), thickness measurement is to be taken to check pitting corrosion.

The minimum acceptable remaining thickness in pits or grooves is equal to:

- 75% of the as built thickness, for pitting or grooving in the frame and brackets webs and flanges

- 70% of the as built thickness, for pitting or grooving in the side shell, hopper tank and topside tank plating attached to the side frame, over a width up to 30 mm from each side of it.

3 Strength check criteria

In general, loads are to be calculated and strength checks are to be carried out for the aft, middle and forward frames of each hold. The scantlings required for frames in intermediate positions are to be obtained by linear interpolation between the results obtained for the above frames.

When scantlings of side frames vary within a hold, the required scantlings are also to be calculated for the mid frame of each group of frames having the same scantlings. The scantlings required for frames in intermediate positions are to be obtained by linear interpolation between the results obtained for the calculated frames.

3.1 Load model

3.1.1 Forces

The forces $P_{fr,a}$ and $P_{fr,b}$, in kN, to be considered for the strength checks at sections a) and b) of side frames (specified in Figure 2; in the case of separate lower brackets, section b) is at the top of the lower bracket), are given by:

$$P_{fr,a} = P_S + \max(P_1, P_2)$$

$$P_{fr,b} = P_{fr,a}\frac{h - 2h_B}{h}$$

where:

P_s = still water pressure force, in kN

$= s\,h\left(\frac{p_{S,U} + p_{S,L}}{2}\right)$ when the upper end of the side frame span h (see Figure 1) is below the load water line

$= s\,h'\left(\frac{p_{S,L}}{2}\right)$ when the upper end of the side frame span h (see Figure 1) is at or above the load water line

P_1 = wave pressure force, in kN, in head sea

$= s\,h\left(\frac{p_{1,U} + p_{1,L}}{2}\right)$

P_2 = wave pressure force, in kN, in beam sea

$= s\,h\left(\frac{p_{2,U} + p_{2,L}}{2}\right)$

h, h_B = side frame span and lower bracket length, in m, defined in Figures 1 and 2, respectively

h' = distance, in m, between the lower end of side frame span h (see Figure 1) and the load water line

s = frame spacing, in m

$P_{S,U}$, $P_{S,L}$ = still water pressure, in kN/m^2, at the upper and lower end of the side frame span h (see Figure 1), respectively

$P_{1,U}$, $P_{1,L}$ = wave pressure, in kN/m^2, as defined in 3.1.2.1) below for the upper and lower end of the side frame span h, respectively

$P_{2,U}$, $P_{2,L}$ = wave pressure, in kN/m^2, as defined in 3.1.2.2) below for the upper and lower end of the side frame span h, respectively

3.1.2 Wave pressure

1) Wave pressure p_1

– The wave pressure p_1, in kN/m^2, at and below the waterline is given by:

$$p_1 = 1{,}50\left[p_{11} + 135\,\frac{B}{2\,(B+75)} - 1{,}2\,(T-z)\right]$$

$$p_{11} = 3\,k_S\,C + k_f$$

– The wave pressure p_1, in kN/m^2, above the water line is given by:

$$p_1 = p_{1wl} - 7{,}50\,(z-T)$$

2) Wave pressure p_2

– The wave pressure p_2, in kN/m^2, at and below the waterline is given by:

$$p_2 = 13{,}0 \left[0{,}5\,B \frac{50\,c_r}{2(B+75)} + C_B \frac{0{,}5\,B + k_f}{14} \left(0{,}7 + 2\frac{z}{T} \right) \right]$$

– The wave pressure p_2, in kN/m^2, above the water line is given by:

$$p_2 = p_{2wl} - 5{,}0\,(z - T)$$

where:

p_{1wl} = p_1 wave sea pressure at the waterline

p_{2wl} = p_2 wave sea pressure at the waterline

L = the distance, in metres, on the summer load waterline from the fore side of stem to the after side of the rudder post, or the centre of the rudder stock if there is no rudder post. L is not to be less than 96%, and need not be greater than 97%, of the extreme length on the summer load waterline.

B = greatest moulded breadth, in m

C_B = moulded block coefficient at draught d corresponding to summer load waterline, based on length L and moulded breadth B, but not to be taken less than 0.6:

$$C_B = \frac{moulded\ displacement\ [m^3]\ at\ draught\ d}{LBd}$$

T = maximum design draught, in m

C = coefficient

$$= 10{,}75 - \left(\frac{300 - L}{100} \right)^{1,5} \quad \text{for } 90 \le L \le 300 \text{ m}$$

$$= 10{,}75 \quad \text{for } 300 < L < 350 \text{ m}$$

$$= 10{,}75 - \left(\frac{L - 350}{150} \right)^{1,5} \quad \text{for } 350 \le L \le 500 \text{ m}$$

$C_r = (1{,}25 - 0{,}025 \frac{2\,k_r}{\sqrt{GM}})\,k$

k = 1,2 for ships without bilge keel

= 1,0 for ships with bilge keel

k_r = roll radius of gyration. If the actual value of k_r is not available

= 0,39 B for ships with even distribution of mass in transverse section (e.g. alternate heavy cargo loading or homogeneous light cargo loading)

= 0,25 B for ships with uneven distribution of mass in transverse section (e.g. homogenous heavy cargo distribution)

GM = 0,12 B if the actual value of GM is not available

z = vertical distance, in m, from the baseline to the load point

$k_s = C_B + \frac{0,83}{\sqrt{C_B}}$ at aft end of L

$= C_B$ between 0,2 L and 0,6 L from aft end of L

$= C_B + \frac{1,33}{C_B}$ at forward end of L

Between the above specified points, k_s is to be varied linearly

k_f = 0,8 C

3.2 Allowable stresses

The allowable normal and shear stresses σ_a and τ_a, in N/mm^2, in the side shell frames are given by:

$\sigma_a = 0,90\ \sigma_F$

$\tau_a = 0,40\ \sigma_F$

where σ_F is the minimum upper yield stress, in N/mm^2, of the material.

3.3 Shear strength check

Where t_M in the lower part of side frames, as defined in Figure 1, is equal to or less

than t_{COAT}, shear strength check is to be carried out in accordance with the following.

The thickness $t_{REN,S}$, in mm, is the maximum between the thicknesses $t_{REN,Sa}$ and $t_{REN,Sb}$ obtained from the shear strength check at sections a) and b) (see Figure 2 and 3.1) given by the following, but need not be taken in excess of $0.75t_{S12}$.

– at section a): $t_{REN,Sa} = \frac{1000\ k_S\ P_{fr,a}}{d_a\ \sin\phi\ \tau_a}$

– at section b): $t_{REN,Sb} = \frac{1000\ k_S\ P_{fr,b}}{d_b\ \sin\phi\ \tau_a}$

where:

k_S = shear force distribution factor, to be taken equal to 0,6

$P_{fr,a}$, $P_{fr,b}$ = pressures forces defined in 3.1

d_a, d_b = bracket and frame web depth, in mm, at sections a) and b), respectively (see Figure 2); in case of separate (non integral) brackets, d_b is to be taken as the minimum web depth deducting possible scallops

ϕ = angle between frame web and shell plate

τ_a = allowable shear stress, in N/mm^2, defined in 3.2.

3.4 Bending strength check

When the lower bracket length and depth do not comply with requirements in annex I, the actual section modulus, in cm^3, of the brackets and side frames at sections a) and b) is to be not less than:

– at section a):

$$Z_a = \frac{1000\ P_{fr,a}\ h}{m_a\ \sigma_a}$$

– at section b)

$$Z_b = \frac{1000\ P_{fr,a}\ h}{m_b\ \sigma_a}$$

where:

$P_{fr,a}$ = pressures force defined in 3.1

h = side frame span, in m, defined in Figure 1

σ_a = allowable normal stress, in N/mm^2, defined in 3.2

m_a, m_b = bending moment coefficients defined in Table 2

The actual section modulus of the brackets and side frames is to be calculated about an axis parallel to the attached plate, based on the measured thicknesses. For pre-calculations, alternative thickness values may be used, provided they are not less than:

- t_{REN}, for the web thickness

- the minimum thicknesses allowed renewal criteria for flange and attached plating of a classification society which is recognized by the Administration in accordance with the provisions of regulation XI/1, or by applicable national standards of the Administration which provide an equivalent level of safety.

The attached plate breadth is equal to the frame spacing, measured along the shell at midspan h. If the actual section moduli at sections a) and b) are less than the values Za and Zb, the frames and brackets are to be renewed or reinforced in order to obtain actual section moduli not less than 1,2 Z_a and 1,2 Z_b, respectively.

In such a case, renewal or reinforcements of the flange are to be extended over the lower part of side frames, as defined in Figure 1.

Table 2 – Bending moment coefficients m_a and m_b

	m_a	m_b		
		$h_B = 0,08\ h$	$h_B = 0,1\ h$	$h_B = 0,125\ h$
Empty holds of ships approved to operate in non homogeneous loading conditions	10	17	19	22
Other cases	12	20	22	26
Note 1: Non homogeneous loading condition means a loading condition in which the ratio between the highest and the lowest filling ratio, evaluated for each hold, exceeds 1,20 corrected for different cargo densities. Note 2: For intermediate values of the bracket length h_B, the coefficient m_b is obtained by linear interpolation between the table values.				

Figure 1 – Lower part of side frames

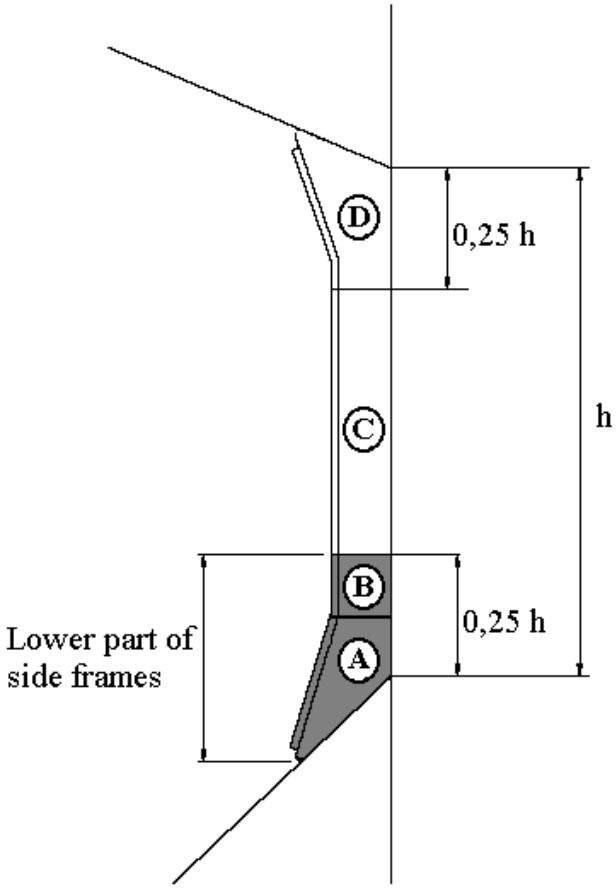
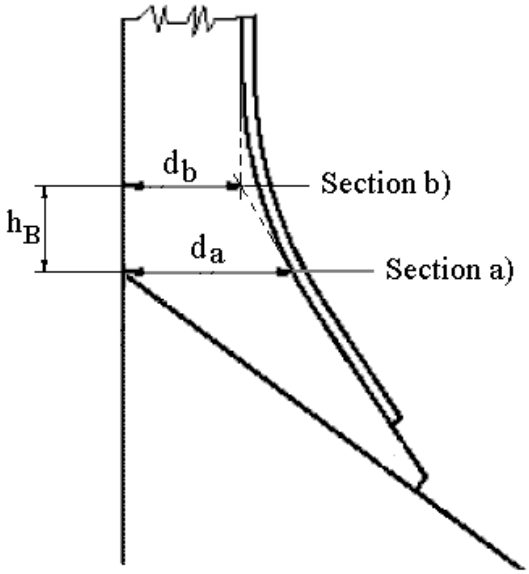


Figure 2 – Sections a) and b)



d_a = lower bracket web depth

d_b = frame web depth

h_B = lower bracket length

Figure 3 – Definition of the lower bracket web depth

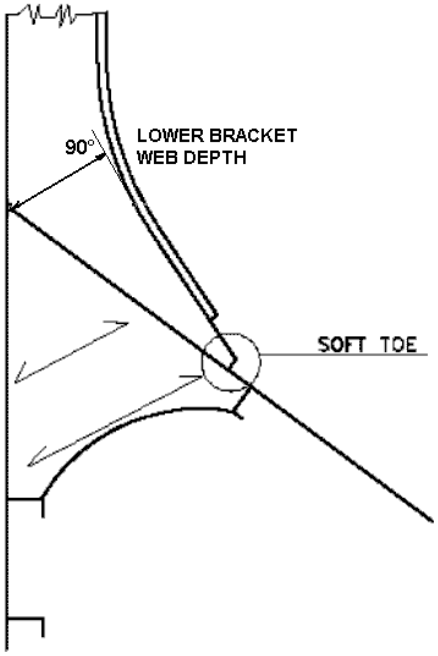


Figure 4 – Tripping brackets

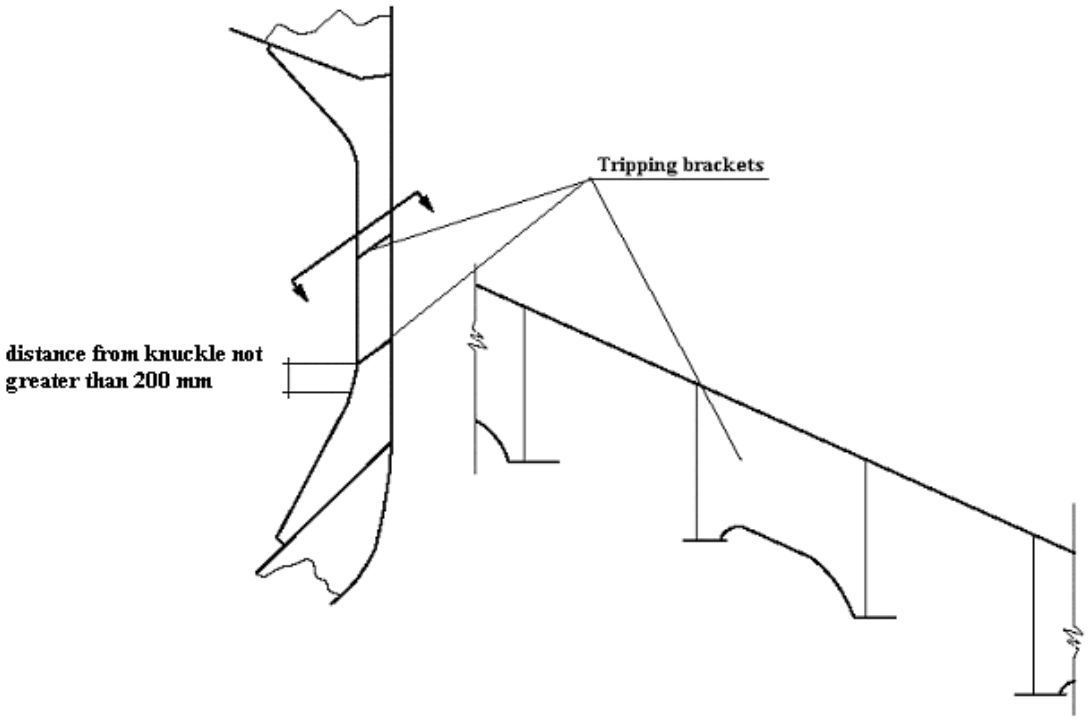
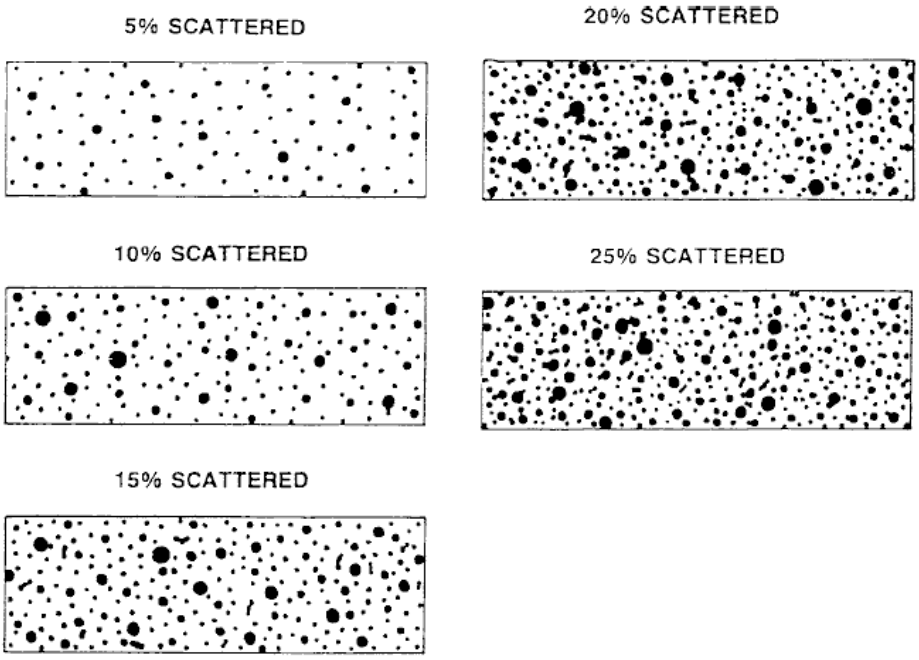


Figure 5 - Pitting intensity diagrams (from 5% to 25% intensity)



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ANNEX 19

DRAFT RESOLUTION MSC.[..(..)]
(adopted on ……..)

STANDARDS FOR OWNERS' INPECTIONS AND MAINTENANCE OF BULK CARRIER HATCH COVERS

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO SOLAS chapter XII on Additional safety measures for bulk carriers, which the 1997 SOLAS Conference adopted with the aim of enhancing the safety of ships carrying solid bulk cargoes,

RECALLING FURTHER that, having recognized the need to further improve the safety of bulk carriers in all aspects of their design, construction, equipment and operation, it examined the results of various formal safety assessment (FSA) studies on bulk carrier safety,

RECOGNIZING that, on the basis of the outcome of the aforementioned FSA studies, replacing hatch covers in existing bulk carriers would not be cost-effective and that, instead, more attention should be paid to hatch cover securing mechanisms and the issue of horizontal loads, especially with regard to maintenance and frequency of inspection,

RECALLING that, at its seventy-seventh session, in approving MSC/Circ.1071 – Guidelines for bulk carrier hatch cover surveys and owners' inspections and maintenance, it invited Member Governments to ensure that companies, as defined in the ISM Code, that operate bulk carriers flying their flag are made aware of the need to implement regular maintenance and inspection procedures for hatch cover closing mechanisms in existing bulk carriers in order to ensure proper operation and efficiency at all times,

HAVING APPROVED, with a view to adoption, draft amendments to SOLAS regulation XII/7 – Survey and maintenance of bulk carriers, where reference is made to mandatory Standards for owners' inspections and maintenance of bulk carrier hatch covers,

HAVING CONSIDERED the recommendation made by the Sub-Committee on Ship Design and Equipment at its forty-seventh session,

1. ADOPTS, for the purposes of the application of SOLAS regulation XII/7, the Standards for owners' inspections and maintenance of bulk carrier hatch covers, set out in the Annex to the present resolution;

2. URGES Governments to ensure that the annexed Standards are utilized when applying SOLAS regulation XII/7.2.

ANNEX

STANDARDS FOR OWNERS' INSPECTIONS AND MAINTENANCE OF BULK CARRIER HATCH COVERS

1 Application

These Standards define requirements for the owners' inspection and maintenance of cargo hatch covers on board bulk carriers.

2 Maintenance of hatch covers and hatch opening, closing, securing and sealing systems

2.1 Lack of weather tightness may be attributed to:

.1 normal wear and tear of the hatch cover system, deformation of the hatch coaming or cover due to impact, wear of the friction pads where fitted, or wear and tear of the cleating arrangement; or

.2 lack of maintenance such as corrosion of plating and stiffeners due to breakdown of coatings, lack of lubrication of moving parts; cleats, joint gaskets and rubber pads in need of replacement, or replaced with incorrect specification parts.

2.2 Insecure hatch covers may be particularly attributed to damage or wear of securing devices, or incorrect adjustment, and incorrect pre-tension and load sharing, of cleating systems.

2.3 Ship owners and operators should therefore institute a programme of maintenance. This maintenance should be directed to:

.1 protecting exposed surfaces of plating and stiffeners of hatch covers and coamings in order to preserve overall structural strength;

.2 preserving the surface of trackways of rolling covers, and of compression bars and other steel work bearing on seals or friction pads, noting that surface smoothness and correct profile are important for reducing wear rates on these components;

.3 maintaining hydraulic or mechanically powered opening, closing securing or cleating systems in accordance with manufacturer's recommendations;

.4 maintaining manual cleats in adjustment, with replacement when significant wastage, wear or loss of adjustment capability is identified;

.5 replacing seals and other wear components in accordance with manufacturers recommendations, noting the need to carry aboard or obtain such spares of correct specification, and that seals are designed for a particular degree of compression, hardness, chemical and wear resistance; and

.6 keeping all hatch cover drains and their non-return valves, where fitted, in working order, noting that any drains fitted to the inboard side of seal lines will have non-return valves for prevention of water ingress to holds in the event of boarding seas.

2.4 The equalization of securing loads should be maintained following the renewal of components such as seals, rubber washers, peripheral and cross joint cleats.

2.5 Ship owners and operators should keep a Maintenance Plan and a record of maintenance and component replacement carried out, to facilitate maintenance planning and statutory surveys by the Administration. Hatch cover maintenance plans should form part of a ship's safety management system as referred to in the ISM Code.

2.6 Where the range of cargoes carried requires different gasket materials, a selection of gasket materials of the correct specification should be carried aboard, in addition to other spares.

2.7 At each operation of a hatch cover, the cover, and in particular bearing surfaces and drainage channels, should be free of debris and as clean as practicable.

2.8 Attention is drawn to the dangers of proceeding to sea without fully secured hatch covers. Securing of all covers should always be completed before the commencement of a sea passage. During voyages, especially on loaded passages, cover securing devices and tightness of cleating and securing arrangements should be checked, especially in anticipation of and following periods of severe weather. Hatch covers should only be opened on passage, when necessary, during favourable sea and weather conditions; imminent weather forecasts should also be considered.

2.9 Operators should consult the cargo securing manual when planning the loading of containers or other cargo on hatch covers and confirm that they are designed and approved for such loads. Lashings should not be secured to the covers or coamings unless these are suitable to withstand the lashing forces.

3 Inspection of hatch covers and hatch opening, closing, securing and sealing systems

3.1 Statutory surveys of hatch covers and their coamings are carried out by the Administration as part of the annual survey required by article 14 of the International Convention on Load Lines, 1966, as modified by the 1988 Protocol relating thereto and in accordance with the requirements for Enhanced Surveys contained in resolution A.744(18), as amended. However the continued safe operation is dependent on the shipowner or operator instituting a regular programme of inspections to confirm the state of the hatch covers in between surveys.

3.2 Routines should be established to perform checks during the voyage, and inspections when the hatch covers are opened.

3.3 Voyage checks should consist of an external examination of the closed hatch cover and securing arrangements in anticipation of, and after, heavy weather but in any event at least once a week, weather permitting. Particular attention should be paid to the condition of hatch covers in the forward 25% of the ship's length, when sea loads are normally greatest.

3.4 The following items should be inspected for each hatch cover set when the hatch covers are opened or are otherwise accessible on each voyage cycle, but need not be more frequent than once per month:

.1 cover panels, including side plates, and stiffener attachments of opened covers for visible corrosion, cracks, or 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 inter-panel hinges, pins and stools where fitted.

As part of this inspection, the coamings with plating, stiffeners and brackets should be checked at each hatchway for visible corrosion, cracks and deformation, especially of the coaming tops and corners, adjacent deck plating and brackets.

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ANNEX 20

DRAFT MSC CIRCULAR

GUIDELINES FOR ASSESSING THE LONGITUDINAL STRENGTH OF BULK CARRIERS DURING LOADING, UNLOADING AND BALLAST WATER EXCHANGE

1 The Maritime Safety Committee, at its seventy-sixth session (2 to 13 December 2002), having considered the results of various FSA studies on bulk carrier safety, agreed that the risk control option calling for the provision of detailed, comprehensive and user-friendly information covering stability and strength characteristics of the ship's hull during loading and unloading should be applied to new bulk carriers. Furthermore, MSC 76 noted that the above-mentioned risk control option was more relevant for smaller ships with respect to stability and for larger ships with respect to structural strength, and instructed the Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety (SLF) and the Sub-Committee on Ship Design and Equipment (DE) to develop relevant guidelines.

2 The DE Sub-Committee, at its forty-seventh session (25 February to 5 March 2004), noting that the SLF Sub-Committee, at its forty-sixth session (8 to 12 September 2003), had prepared draft SOLAS amendments to address the stability issues on bulk carriers of less than 150 m in length, agreed that for bulk carriers of 150 m in length and above, user-friendly guidelines for assessing the longitudinal strength would be more appropriate.

3 The Maritime Safety Committee, at its [seventy-eighth session (12 to 21 May 2004)], following the recommendation of DE 47, approved the Guidelines for assessing the longitudinal strength of bulk carriers during loading, unloading and ballast water exchange, set out in the annex to the present circular.

4 Member Governments are invited to bring the annexed Guidelines to the attention of loading instrument manufacturers, related computer software developers, mariners, dry cargo terminal operators and other parties involved in loading, unloading and ballast water exchange operations.

ANNEX

GUIDELINES FOR ASSESSING THE LONGITUDINAL STRENGTH OF BULK CARRIERS DURING LOADING, UNLOADING AND BALLAST EXCHANGE

1 Preamble

The aim of these guidelines is to ensure the provision of detailed, comprehensive and user-friendly information covering the longitudinal strength characteristics of the ship's hull during loading, unloading and ballast exchange.

2 Definition

2.1 Loading Manual

The Loading Manual is a document which describes:

.1 the loading conditions on which the design of the ship has been based, including permissible limits of still water bending moments and shear forces;

.2 the results of the calculations of still water bending moments, shear forces and where applicable, limitations due to torsional loads;

.3 for bulk carriers, envelope results and permissible limits of still water bending moments and shear forces in the hold flooded condition as applicable;

.4 the cargo hold(s) or combination of cargo holds that might be empty at full draught. If no cargo hold is allowed to be empty at full draught, this is to be clearly stated in the Loading Manual; and

.5 the allowable local loading for the structure (hatch covers, decks, double bottom, etc.).

2.2 Loading instrument

A loading instrument is an instrument, which is either analog or digital, by means of which it can be easily and quickly ascertained that, at specified read-out points, the still water bending moments, shear forces, loading on the double bottom, and the still water torsional moments, where applicable, in any load or ballast condition will not exceed the specified permissible values during planned loading, unloading and ballast exchange.

In this context the loading instrument comprises the hardware and software.

3 Information to be provided

3.1 Loading Manual

For the loading, unloading and stowage of solid bulk cargoes reference should be made to SOLAS regulation VI/7 and the related Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code).

The Loading Manual should contain typical loading sequences where the ship is loaded from commencement of cargo loading to reaching full deadweight capacity, for homogeneous conditions, relevant part load conditions and alternate conditions where applicable. Typical unloading sequences for these conditions should be included.

The typical loading sequences should be developed paying due attention to the loading rate, the deballasting capacity and the applicable strength and draught limitations.

The typical loading and unloading sequences should include, as relevant:

.1 alternate light and heavy cargo load condition;

.2 homogeneous light and heavy cargo load condition;

.3 short voyage condition where the ship is loaded to maximum draught but with limited bunkers;

.4 multiple port loading/unloading condition;

.5 deck cargo condition;

.6 block loading; and

.7 ballast exchange conditions, if not covered by other documents.

3.2 Loading instrument

The input/output format of the loading instrument should, as far as practicable, be easily comparable in information and format to the Loading Manual so that the operators will easily gain familiarity with the loading calculations.

The loading instrument should readily provide any information that may be obtained from the Loading Manual by incremented calculation reflecting the operation scenario in a clearly presented format.

A simple and straightforward operation manual written in the same language as the Loading Manual should be provided. That manual should contain the approved test conditions. The manual should 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 should be provided with a manual written also in the English language.

For each occasion when the ship is loaded/unloaded or ballast is exchanged at sea the sequence of the operations should be checked using the approved loading instrument.

Where applicable, the loading instrument should also be capable of performing calculations for break bulk cargo and loading of different grades of cargo in the same cargo hold.

The sequence is to be built up step by step from commencement of cargo loading to reaching full deadweight capacity. Each time the loading equipment changes position to a new hold defines a step. Each step should be documented. In addition to longitudinal strength, the local strength of each hold is to be considered.

For each loading condition a summary of all steps is to be included. This summary is to highlight the essential information for each step such as:

.1 how much cargo is filled in each hold during the different steps;

.2 how much ballast is discharged from each ballast tank during the different steps;

.3 the maximum still water bending moment and shear at the end of each step; and

.4 the ship's trim and draught at the end of each step.

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ANNEX 21

NEW DRAFT TERMS OF REFERENCE FOR THE SUB-COMMITTEE

1 Under the direct instructions of the Maritime Safety Committee and as may be requested by the Marine Environment Protection Committee, the Sub-Committee on Ship Design and Equipment (DE) will consider matters related to the following subjects, including the development of any necessary amendments to relevant conventions and other mandatory and non-mandatory instruments, as well as the preparation of new mandatory and non-mandatory instruments, guidelines and recommendations, for consideration by the Committees, as appropriate:

.1 design, construction, structure, equipment, machinery installations and electrical installations of all types of ships, vessels and craft covered by IMO instruments;

.2 life-saving equipment, appliances and arrangements; and

.3 survey and certification.

2 The conventions and mandatory instruments referred to above include, as a minimum:

.1 1974 SOLAS Convention (chapters I, II-1, III, X, XI-1 and XII and other relevant chapters, as appropriate) and the 1988 Protocol relating thereto;

.2 MARPOL 73/78 (Annex I and IV and other relevant annexes, as appropriate);

.3 International Life-Saving Appliance (LSA) Code;

.4 International Code of Safety for High-Speed Craft (HSC Code) 1994 and 2000;

.5 Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers (resolution A.744(18)); and

.6 Condition Assessment Scheme (CAS) (resolution MEPC.94(46)).

3 The non-mandatory instruments, which the Sub-Committee may be called upon to review, include, as a minimum:

.1 Code of Safety for Dynamically Supported Craft (DSC Code);

.2 Code for the Construction and Equipment of Mobile Offshore Drilling Units (MODU Code);

.3 Code of Safe Practice for the Carriage of Cargoes and Persons by Offshore Supply Vessels (OSV Code);

.4 Code of Safety for Diving Systems;

.5 Code of Safety for Special Purpose Ships (SPS Code);

.6 Code on Alarms and Indicators;

.7 Code on Noise Level on Board Ships;

.8 Interim Guidelines for Wing-In-Ground (WIG) Craft;

.9 Standards for Ship Manoeuvrability;

.10 Guidelines for the Design, Construction and Operation of Passenger Submersible Craft; and

.11 Guidelines for Ships Operating in Arctic Ice-Covered Waters.

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ANNEX 22

DRAFT REVISED WORK PROGRAMME* AND PROVISIONAL AGENDA FOR DE 48

		Target completion date/number of sessions needed for completion	Reference
1	Casualty analysis (co-ordinated by FSI)	Continuous	MSC 70/23, paragraphs 9.17 and 20.4
H.1	**Amendments to resolution A.744(18)**	~~2004~~ 2006	DE 45/27, paragraphs 7.18 and 7.19; DE 46/32, section 5 DE 47/25, section 3
H.2	**Safety aspects of water ballast management** (in co-operation with NAV and SLF)	~~2 sessions~~ 2006	MSC 71/23, paragraph 9.11; DE 46/32, section 6 DE 47/25, paragraphs 22.4 and 22.5
H.3	**Large passenger ship safety**	~~2004~~ 2006	MSC 74/24, paragraph 21.4; DE 46/32, section 7 DE 47/25, section 4
H.4	**Measures to prevent accidents with lifeboats** (in co-operation with FSI, NAV and STW)	~~2004~~ 2006	MSC 74/24, paragraph 21.34; DE 46/32, section 9 DE 47/25, section 5

* **Notes:** 1 "H" means a high priority item and "L" a low priority one. However, within the high and low priority groups, items have not been listed in any order of priority.

2 Strike-out text indicates proposed deletions and shaded text proposed additions or changes.

3 Items printed in bold letters have been selected for the provisional agenda of DE 48.

H.5	**Protection of fuel tanks** (in co-operation with BLG and SLF as necessary)	2005	DE 44/19, paragraph 2.7.2; MEPC 46/23, paragraph 20.18; MSC 74/24, paragraph 21.36 DE 47/25, section 6
~~H.6~~	~~**Review of fast rescue boat and means of rescue requirements**~~	~~2004~~	~~MSC 74/24, paragraph 21.39; DE 46/32, section 11~~
~~H.7~~ H.6	**Anchoring, mooring and towing equipment**	~~2004~~ 2005	MSC 74/24, paragraph 21.42; DE 46/32, section 12 DE 47/25, section 8
~~H.8~~ H.7	**Performance testing and approval standards for SOLAS personal life-saving appliances**	2005	MSC 74/24, paragraph 21.46; DE 46/32, section 14 DE 47/25, section 9
~~H.9~~ H.8	**Review of the OSV Guidelines** (in co-operation with FP, COMSAR, NAV and SLF)	~~3 sessions~~ 2007	MSC 75/24, paragraph 22.4
~~H.10~~ H.9	**Review of the 2000 HSC Code and amendments to the DSC Code and the 1994 HSC Code** (in co-operation with FP, COMSAR, NAV and SLF)	2005	MSC 75/24, paragraph 12.22; MSC 76/23, paragraphs 8.19 and 20.4 DE 47/25, section 10
~~H.11~~	~~**Protection of pump-rooms of tankers and access to shore-based computer programs for salvage operations** (in co-operation with BLG as necessary)~~	~~2004~~	~~MEPC 47/20, paragraph 18.15; MEPC 48/21, paragraph 18.3.2~~
~~H.12~~	~~**Fitting of water ingress alarms in new, single hold cargo ships** (in co-operation with DSC as necessary)~~	~~2004~~	~~MSC 76/23, paragraph 20.36~~
~~H.13~~	~~**Consideration of IACS unified interpretations**~~	~~2004~~	~~MSC 76/23, paragraph 20.3; DE 46/32, section 16~~
~~H.14~~	~~**Alternate hold loading ban for bulk carriers** (in co-operation with DSC)~~	~~2004~~	~~MSC 76/23, paragraph 20.39.6; DE 46/32, section 23~~

~~H.15~~	~~**Double-side skin construction of bulk carriers**~~	~~2004~~	~~MSC 76/23, paragraph 20.39.7; DE 46/32, section 24~~
~~H.16~~	~~**Application of structural standards in SOLAS chapter XII**~~	~~2004~~	~~MSC 76/23, paragraph 20.39.7; DE 46/32, section 25~~
~~H.17~~	~~**Improved loading/stability information for bulk carriers** (co-ordinated by SLF)~~	~~2004~~	~~MSC 76/23, paragraphs 20.41.1 and 20.48; DE 46/32, section 26~~
~~H.18~~ H.10	**Performance standards for protective coatings**	~~2004~~ 2006	MSC 76/23, paragraphs 20.41.2 and 20.48; DE 46/32, section 27 DE 47/25, section 18
~~H.20~~ H.11	**Inspection and survey requirements for accommodation ladders**	~~2 sessions~~ 2006	MSC 77/26, paragraph 23.32
~~H.21~~ H.12	**Mandatory emergency towing systems in ships other than tankers greater than 20,000 dwt**	~~2 sessions~~ 2006	MSC 77/26, paragraph 23.33 DE 47/25, paragraph 24.9
~~I.1~~ H.13	Guidelines under MARPOL Annex VI on prevention of air pollution from ships		MEPC 41/20, paragraph 8.22.1; DE 42/15, paragraphs 10.2 to 10.4
	.1 Guidelines on equivalent methods to reduce on-board NOx emission	2 sessions	
	.2 **Guidelines on on-board exhaust gas cleaning systems**	2005	DE 46/32, paragraphs 3.10 and 29.9.6.1 DE 47/25, section 20
	.3 Guidelines on other technological methods verifiable or enforceable to limit SOx emission	2 sessions	
H.14	**Compatibility of life-saving appliances**	2006	DE 47/25, paragraph 5.3

H.15	**Inconsistencies in IMO instruments regarding requirements for life-saving appliances**	2006	DE 47/25, paragraph 9.7
~~L.2~~ L.1	**Revision of the forms of nuclear ship safety certificates** (in co-operation with COMSAR and NAV)	~~2 sessions~~ 2006	MSC 75/24, paragraph 22.6
~~L.3~~	~~**Revision of the Explanatory notes to the Standards for ship manoeuvrability**~~	~~2004~~	~~MSC 76/23, paragraph 20.38; DE 46/32, paragraph 29.9.4.2~~
~~L.4~~ L.2	Revision of resolution A.760(18)	2 sessions	DE 46/32, paragraph 31.23
~~H.19~~ L.3	Free-fall lifeboats with float-free capability	~~2004~~ 1 session	MSC 76/23, paragraphs 20.41.3 and 20.48; DE 46/32, section 28

DRAFT PROVISIONAL AGENDA FOR DE 48*

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Amendments to resolution A.744(18)

4 Large passenger ship safety

5 Measures to prevent accidents with lifeboats

6 Anchoring, mooring and towing equipment

7 Protection of fuel tanks

8 Compatibility of life-saving appliances

9 Performance testing and approval standards for SOLAS personal life-saving appliances

10 Inconsistencies in IMO instruments regarding requirements for life-saving appliances

11 Review of the 2000 HSC Code and amendments to the DSC Code and the 1994 HSC Code

12 Performance standards for protective coatings

13 Guidelines on on-board exhaust gas cleaning systems

14 Mandatory emergency towing systems in ships other than tankers greater than 20,000 dwt

15 Review of the OSV Guidelines

16 Inspection and survey requirements for accommodation ladders

17 Safety aspects of water ballast management

18 Revision of the forms of nuclear ship safety certificates

19 Work programme and agenda for DE 49

20 Election of Chairman and Vice-Chairman for 2006

21 Any other business

22 Report to the Maritime Safety Committee

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* Agenda item numbers do not necessarily indicate priority.

ANNEX 23

REVISED* REGULATION II-1/3-6 OF THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED (RESOLUTION MSC.134(76))

CHAPTER II-1
CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

PART A-1
STRUCTURE OF SHIPS

Regulation 3-6
Access to and within spaces in, and forward of, the cargo area of oil tankers and bulk carriers

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

"1 Application

1.1 Except as provided for in paragraph 1.2, this regulation applies to oil tankers of 500 gross tonnage and over and bulk carriers, as defined in regulation IX/1, of 20,000 gross tonnage and over, constructed on or after [1 January 2005].

1.2 Oil tankers of 500 gross tonnage and over constructed on or after 1 October 1994 but before 1 January 2005 shall comply with the provisions of regulation II-1/12-2 adopted by resolution MSC.27(61).

2 Means of access to cargo and other spaces

2.1 Each space ~~within the cargo area~~ shall be provided with ~~a permanent~~ means of access to enable, throughout the life of a ship, overall and close-up inspections and thickness measurements of the ship's structures to be carried out by the Administration, the company, as defined in regulation IX/1, and the ship's personnel and others as necessary. Such means of access shall comply with the requirements of paragraph 5 and with the Technical provisions for means of access for inspections, adopted by the Maritime Safety Committee by resolution [MSC.133(76)], 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.

2.2 Where a permanent means of access may be susceptible to damage during normal cargo loading and unloading operations or where it is impracticable to fit permanent

* Proposed amendments are shown in strike-out and shading.

means of access, the Administration may allow, in lieu thereof, the provision of movable or portable means of access, as specified in the Technical provisions, provided that the means of attaching, rigging, suspending or supporting the portable means of access forms a permanent part of the ship's structure. All portable equipment shall be capable of being readily erected or deployed by ship's personnel.

2.3 The construction and materials of all means of access and their attachment to the ship's structure shall be to the satisfaction of the Administration. The means of access shall be subject to survey prior to, or in conjunction with, its use in carrying out surveys in accordance with regulation I/10.

3 Safe access to cargo holds, cargo tanks, ballast tanks and other spaces

3.1 Safe access* to cargo holds, cofferdams, ballast tanks, cargo tanks and other spaces in the cargo area shall be direct from the open deck and such as to ensure their complete inspection. Safe access* to double bottom spaces or to foreward ballast tanks may be from a pump-room, deep cofferdam, pipe tunnel, cargo hold, double hull space or similar compartment not intended for the carriage of oil or hazardous cargoes.

3.2 Tanks, and subdivisions of tanks, having a length of 35 m or more, shall be fitted with at least two access hatchways and ladders, as far apart as practicable. Tanks less than 35 m in length shall be served by at least one access hatchway and ladder. When a tank is subdivided by one or more swash bulkheads or similar obstructions which do not allow ready means of access to the other parts of the tank, at least two hatchways and ladders shall be fitted.

3.3 Each cargo hold shall be provided with at least two means of access as far apart as practicable. In general, these accesses should be arranged diagonally, for example one access near the forward bulkhead on the port side, the other one near the aft bulkhead on the starboard side.

4 Ship structure access manual

4.1 A ship's means of access to carry out overall and close-up inspections and thickness measurements shall be described in a Ship structure access manual approved by the Administration, an updated copy of which shall be kept on board. The Ship structure access manual shall include the following for each space ~~in the cargo area~~:

.1 plans showing the means of access to the space, with appropriate technical specifications and dimensions;

.2 plans showing the means of access within each space to enable an overall inspection to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate from where each area in the space can be inspected;

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* Refer to the Recommendations for entering enclosed spaces aboard ships, adopted by the Organization by resolution A.864(20).

.3 plans showing the means of access within the space to enable close-up inspections to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate the positions of critical structural areas, whether the means of access is permanent or portable and from where each area can be inspected;

.4 instructions for inspecting and maintaining the structural strength of all means of access and means of attachment, taking into account any corrosive atmosphere that may be within the space;

.5 instructions for safety guidance when rafting is used for close-up inspections and thickness measurements;

.6 instructions for the rigging and use of any portable means of access in a safe manner;

.7 an inventory of all portable means of access; and

.8 records of periodical inspections and maintenance of the ship's means of access.

4.2 For the purpose of this regulation "critical structural areas" are locations which have been identified from calculations to require monitoring or from the service history of similar or sister ships to be sensitive to cracking, buckling, deformation or corrosion which would impair the structural integrity of the ship.

5 General technical specifications

5.1 For access through horizontal openings, hatches or manholes, the dimensions shall be sufficient to allow a person wearing a self-contained air-breathing apparatus and protective equipment to ascend or descend any ladder without obstruction and also provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening shall not be less than 600 mm x 600 mm. When access to a cargo hold is arranged through the cargo hatch, the top of the ladder shall be placed as close as possible to the hatch coaming. Access hatch coamings having a height greater than 900 mm shall also have steps on the outside in conjunction with the ladder.

5.2 For access through vertical openings, or manholes, in swash bulkheads, floors, girders and web frames providing passage through the length and breadth of the space, the minimum opening shall be not less than 600 mm x 800 mm at a height of not more than 600 mm from the bottom shell plating unless gratings or other foot holds are provided.

5.3 For oil tankers of less than 5,000 tonnes deadweight, the Administration may approve, in special circumstances, smaller dimensions for the openings referred to in paragraphs 5.1 and 5.2, if the ability to traverse such openings or to remove an injured person can be proved to the satisfaction of the Administration."

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ANNEX 24

DRAFT REVISED TECHNICAL PROVISIONS FOR MEANS OF ACCESS FOR INSPECTIONS (RESOLUTION MSC.133(76))

1 Preamble

1.1 It has long been recognised that the only way of ensuring that the condition of a ship's structure is maintained to conform with the applicable requirements is for all its components to be surveyed on a regular basis throughout their operational life. This will ensure that they are free from damage such as cracks, buckling or deformation due to corrosion, overloading, or contact damage and that thickness diminution is within established limits. The provision of suitable means of access to the hull structure for the purpose of carrying out overall and close-up surveys and inspections is essential and such means should be considered and provided for at the ship design stage.

1.2 Ships should be designed and built with due consideration as to how they will be surveyed by flag State inspectors and classification society surveyors during their in-service life and how the crew will be able to monitor the condition of the ship. Without adequate access, the structural condition of the ship can deteriorate undetected and major structural failure can arise. A comprehensive approach to design and maintenance is required to cover the whole projected life of the ship.

1.3 In order to address this issue, the Organization has developed these Technical provisions for means of access for inspections, intended to facilitate close-up inspections and thickness measurements of the ship's structure referred to in SOLAS regulation II-1/3-6 on Access to and within spaces in, and forward of, the cargo area of oil tankers and bulk carriers. This regulation does not apply to combined chemical/oil tankers complying with the provisions of the IBC Code that may be engaged in the intermittent carriage of oil cargoes.

1.4 Permanent means of access which are designed to be integral parts of the structure itself are preferred and Administrations may allow reasonable deviations to facilitate such designs.

2 Definitions

For the purpose of these Technical provisions, the following definitions apply in addition to those provided in the 1974 SOLAS Convention, as amended, and in resolution A.744(18), as amended:

.1 *Rung* means the step of vertical ladder or step on the vertical surface.

.2 *Tread* means the step of inclined ladder, or step for the vertical access opening.

.3 *Flight of an inclined ladder* means the actual stringer length of an inclined ladder. For vertical ladders, it is the distance between the platforms.

4. *Stringer* means:

.1 the frame of a ladder; or

.2 the stiffened horizontal plating structure fitted on side shell, transverse bulkheads and/or longitudinal bulkheads in the space. For the purpose of ballast tanks of less than 5 m width forming double side spaces, the horizontal plating structure is credited as a stringer and a longitudinal permanent means of access, if it provides a continuous passage of 600 mm or more in width past frames or stiffeners on the side shell or longitudinal bulkhead. Openings in stringer plating utilized as permanent means of access shall be arranged with guard rails or grid covers to provide safe passage on the stringer or safe access to each transverse web.

.5 *Vertical ladder* means a ladder of which the inclined angle is 70º and over up to 90º. Vertical ladder shall not be skewed by more than 2º.

.6 *Overhead obstructions* mean the deck or stringer structure including stiffeners above the means of access.

.7 *Distance below deck head* means the distance below the plating.

.8 *Cross deck* means the transverse area of main deck which is located inboard and between hatch coamings.

3 Technical provisions

3.1 Structural members subject to the close-up inspections and thickness measurements of the ship's structure referred to in SOLAS regulation II-1/3-6, except those in double bottom spaces, shall be provided with a permanent means of access to the extent as specified in table 1 and table 2, as applicable. For oil tankers and wing ballast tanks of ore carriers, approved alternative methods may be used in combination with the fitted permanent means of access, provided that the structure allows for its safe and effective use.

3.2 Permanent means of access should as far as possible be integral to the structure of the ships, thus ensuring that they are robust and at the same time contributing to the overall strength of the structure, of the ship.

3.3 Elevated passageways forming sections of a permanent means of access, where fitted, shall have a minimum clear width of 600 mm, except for going around vertical webs where the minimum clear width may be reduced to 450 mm, and have guard rails over the open side of their entire length. Sloping structure providing part of the access shall be of a non-skid construction. Guard rails shall be 1,000 mm in height and consist of a rail and intermediate bar 500 mm in height and of substantial construction. Stanchions shall be not more than 3 m apart.

3.4 Access to permanent means of access and vertical openings from the ship's bottom shall be provided by means of easily accessible passageways, ladders or treads. Treads shall be provided with lateral support for the foot. Where the rungs of ladders are fitted against a vertical surface, the distance from the centre of the rungs to the surface shall be at least 150 mm. Where vertical manholes are fitted higher than 600 mm above the walking level, access shall be facilitated by means of treads and hand grips with platform landings on both sides.

3.5 Permanent inclined ladders shall be inclined at an angle of less than 70º. There shall be no obstructions within 750 mm of the face of the inclined ladder, except that in way of an opening this clearance may be reduced to 600 mm. The flights of inclined ladders shall not normally be more than 6 m vertical height. Resting platforms of adequate dimensions shall be provided normally at a maximum of 6 m vertical height. Ladders and handrails shall be constructed of steel or equivalent material of adequate strength and stiffness and securely attached to the tank structure by stays. The method of support and length of stay shall be such that vibration is reduced to a practical minimum. In cargo holds, ladders shall be designed and arranged so that cargo handling difficulties are not increased and the risk of damage from cargo handling gear is minimized.

3.6 The width of inclined ladders between stringers shall not be less than 400 mm. The treads shall be equally spaced at a distance apart, measured vertically, of between 200 mm and 300 mm. When steel is used, the treads shall be formed of two square bars of not less that 22 mm by 22 mm in section, fitted to form a horizontal step with the edges pointing upward. The treads shall be carried through the side stringers and attached thereto by double continuous welding. All inclined ladders shall be provided with handrails of substantial construction on both sides, fitted at a convenient distance above the treads.

3.7 For vertical ladders or spiral ladders, the width and construction should be in accordance with international or national standards accepted by the Administration.

3.8 No free-standing portable ladder shall be more than 5 m long.

3.9 Alternative means of access include, but are not limited to such devices as:

.1 hydraulic arm fitted with a stable base;

.2 wire lift platform;

.3 staging;

.4 rafting;

.5 robot arm or remotely operated vehicle (ROV);

.6 portable ladders more than 5 m long shall only be utilized if fitted with a mechanical device to secure the upper end of the ladder;

.7 other means of access, approved by and acceptable to the Administration.

Means for safe operation and rigging of such equipment to and from, and within these spaces, shall be clearly described in the Ship structure access manual.

3.10 For access through horizontal openings, hatches or manholes, the minimum clear opening shall not be less than 600 mm x 600 mm. When access to a cargo hold is arranged through the cargo hatch, the top of the ladder shall be placed as close as possible to the hatch coaming. Access hatch coamings having a height greater than 900 mm shall also have steps on the outside in conjunction with the ladder.

3.11 For access through vertical openings, or manholes, in swash bulkheads, floors, girders and web frames providing passage through the length and breadth of the space, the minimum opening shall be not less than 600 mm x 800 mm at a height of not more than 600 mm from the passage unless gratings or other foot holds are provided.

3.12 For oil tankers of less than 5,000 tonnes deadweight, the Administration may approve, in special circumstances, smaller dimensions for the openings referred to in paragraphs 3.10 and 3.11, if the ability to traverse such openings or to remove an injured person can be proved to the satisfaction of the Administration.

3.13 For bulk carriers, access ladders to cargo holds and other spaces shall be:

.1 Where the vertical distance between the upper surface of adjacent decks or between deck and the bottom of the cargo space is not more than 6 m, either a vertical ladder or an inclined ladder.

.2 Where the vertical distance between the upper surface of adjacent decks or between deck and the bottom of the cargo space is more than 6 m, an inclined ladder or series of inclined ladders at one end of the cargo hold, except the uppermost 2.5 m of a cargo space measured clear of overhead obstructions and the lowest 6 m may have vertical ladders, provided that the vertical extent of the inclined ladder or ladders connecting the vertical ladders is not less than 2.5 m.

The second means of access at the other end of the cargo hold may be formed of a series of staggered vertical ladders, which should comprise one or more ladder linking platforms spaced not more than 6 m apart vertically and displaced to one side of the ladder. Adjacent sections of ladder should be laterally offset from each other by at least the width of the ladder. The uppermost, entrance section, of the ladder directly exposed to a cargo hold should be vertical for a distance of 2.5 m measured clear of overhead obstructions and connected to a ladder-linking platform.

.3 A vertical ladder may be used as a means of access to topside tanks, where the vertical distance is 6 m or less between the deck and the longitudinal means of access in the tank or the stringer or the bottom of the space immediately below the entrance. The uppermost, entrance section from deck, of the vertical ladder of the tank should be vertical for a distance of 2.5 m measured clear of the overhead obstructions and comprises a ladder linking platform unless landing on the longitudinal means of access, the stringer or the bottom within the vertical distance, it should be displaced to one side of a vertical ladder.

.4 Unless allowed in .3 above, an inclined ladder or combination of ladders should be used for access to a tank or a space where the vertical distance is greater than 6 m between the deck and a stringer immediately below the entrance, between stringers, or between the deck or a stringer and the bottom of the space immediately below the entrance.

.5 In case of .4 above, the uppermost, entrance section from deck, of the ladder should be vertical for a distance of 2.5 m clear of the overhead obstructions and connected to a landing platform and continued with an inclined ladder. The flights of inclined ladders should not be more than 9 m in actual length and the vertical height should not normally be more than 6 m. The lowermost section of the ladders may be vertical for a vertical distance of not less than 2.5 m.

.6 In double side skin spaces of less than 2.5 m width, the access to the space may be by means of vertical ladders that comprises one or more ladder linking platforms spaced not more than 6 m apart vertically and displace to one side of the ladder. Adjacent sections of ladder should be laterally offset from each other by at least the width of the ladder.

.7 A spiral ladder is considered acceptable as an alternative for inclined ladders. In this regard, the uppermost 2.5 m can continue to be comprised of the spiral ladder and need not change over to vertical ladders. The width and construction of such spiral ladders should be in accordance with international or national standards accepted by the Administration.

3.14 The uppermost, entrance section from deck, of the vertical ladder providing access to a tank should be vertical for a distance of 2.5 m measured clear of the overhead obstructions and comprises a ladder linking platform. It should be displaced to one side of a vertical ladder. The vertical ladder can be between 1.6 m and 3 m below deck structure if it lands on a longitudinal or athwartship permanent means of access fitted within that range.

Table 1 - Means of access for ballast and cargo tanks of oil tankers*

1 Water ballast tanks, except those specified in the right column, and cargo oil tanks	**2 Water ballast wing tanks of less than 5 m width forming double side spaces and their bilge hopper sections**
Access to the underdeck and vertical structure	
1.1 For tanks of which the height is 6 m and over containing deck internals such as deck longitudinals and transverse webs, permanent means of access shall be provided in accordance with .1 to .6: .1 continuous athwartship permanent access arranged at each transverse bulkhead on the stiffened surface, at a minimum of 1.6 m to a maximum of 3 m below the deck head; .2 at least one continuous longitudinal permanent means of access at each side of the tank. One of these accesses shall be at a minimum of 1.6 m to a maximum of 6 m below the deck head and the other shall be at a minimum of 1.6 m to a maximum of 3 m below the deck head; .3 access between the arrangements specified in .1 and .2 and from the main deck to either .1 or .2; .4 continuous longitudinal permanent means of access which are integrated in the structural member on the stiffened surface of a longitudinal bulkhead, in alignment, where possible, with horizontal girders of transverse bulkheads are to be provided for access to the transverse webs unless permanent fittings are installed at the uppermost platform for use of alternative means as defined in paragraph 3.9 of the Technical Provisions for inspection at intermediate heights; .5 for ships having cross-ties which are 6 m or more above tank bottom, a transverse permanent means of access on the cross-ties providing inspection of the tie flaring brackets at both sides of the tank, with access from one of the longitudinal permanent means of access in .4;	2.1 For double side spaces above the upper knuckle point of the bilge hopper sections, permanent means of access are to be provided in accordance with .1 and .2: .1 where the vertical distance between horizontal uppermost stringer and deck head is 6 m or more, one continuous longitudinal permanent means of access shall be provided for the full length of the tank with a means to allow passing through transverse webs installed at a minimum of 1.6 m to a maximum of 3 m below the deck head with a vertical access ladder at each end of the tank; and .2 continuous longitudinal permanent means of access, which are integrated in the structure, at a vertical distance not exceeding 6 m apart. Plated stringers shall, as far as possible, be in alignment with horizontal girders of transverse bulkheads.

.6 combination of vertical ladders on transverse webs and alternate means as defined in paragraph 3.9 of the Technical Provisions may be provided for small ships as an alternative to .4 for cargo oil tanks of which the height is less than 17 m.	
1.2 For tanks of which the height is less than 6 m, alternative means as defined in paragraph 3.9 of the Technical Provisions or portable means may be utilized in lieu of the permanent means of access.	2.2 For bilge hopper sections of which the vertical distance from the tank bottom to the upper knuckle point is 6 m and over, one longitudinal permanent means of access shall be provided for the full length of the tank. It shall be accessible by vertical permanent means of access at each end of the tank. 2.2.1 The longitudinal continuous permanent means of access may be installed at a minimum 1.6 m to maximum 3 m from the top of the bilge hopper section. When an extension platform is arranged on the web, then the requirement for vertical ladder access to these need not apply. 2.2.2 Alternatively the continuous longitudinal permanent means of access may be installed at a minimum of 1.2 m below the top of the clear opening of the web ring allowing a use of portable means of access to reach identified structural critical areas.
Fore peak tanks 1.3 For fore peak tanks with a depth of 6 m or more at the centre line of the collision bulkhead, a suitable means of access shall be provided for access to critical areas such as the underdeck structure, stringers, collision bulkhead and side shell structure. 1.3.1 Stringers of less than 6 m in vertical distance from the deck head or a stringer immediately above are considered to provide suitable access in combination with portable means of access. 1.3.2 In case the vertical distance between the deck head and stringers, stringers or the lowest stringer and the tank bottom is 6 m or more, alternative means of access as defined in paragraph 3.9 of the Technical Provisions shall be provided.	2.3 Where the vertical distance referred to in 2.2 is less than 6 m, alternative means as defined in paragraph 3.9 of the Technical Provisions or portable means of access may be utilised in lieu of the permanent means of access. To facilitate the operation of the alternative means of access, in-line openings in horizontal stringers shall be provided. The openings shall be of an adequate diameter and shall have suitable protective railings.

Table 2 - Means of access for bulk carriers*

1 Cargo holds	2 Ballast tanks
Access to underdeck structure 1.1 Permanent means of access shall be fitted to provide access to the overhead structure at both sides of the cross deck and in the vicinity of the centerline. Each means of access shall be accessible from the cargo hold access or directly from the main deck and installed at a minimum of 1.6 m to a maximum of 3 m below the deck. 1.2 An athwartship permanent means of access fitted on the transverse bulkhead at a minimum 1.6 m to a maximum 3 m below the cross-deck head is accepted as equivalent to 1.1. 1.3 Access to the permanent means of access to overhead structure of the cross deck may also be via the upper stool. 1.4 Ships having transverse bulkheads with full upper stools with access from the main deck which allows monitoring of all framing and plates from inside, do not require permanent means of access of the cross deck. 1.5 Alternatively, movable means of access may be utilized for access to the overhead structure of cross deck if its vertical distance is 17 m or less above the tank top.	**Top side tanks** 2.1 For each topside tank of which the height is 6 m and over, one longitudinal continuous permanent means of access shall be provided along the side shell webs and installed at a minimum of 1.6 m to a maximum of 3 m below deck with a vertical access ladder in the vicinity of each access to that tank. 2.2 If no access holes are provided through the transverse webs within 600 mm of the tank base and the web frame rings have a web height greater than 1 m in way of side shell and sloping plating, then step rungs/grab rails shall be provided to allow safe access over each transverse web frame ring. 2.3 Three permanent means of access, fitted at the end bay and middle bay of each tank, shall be provided spanning from tank base up to the intersection of the sloping plate with the hatch side girder. The existing longitudinal structure, if fitted on the sloping plate in the space may be used as part of this means of access. 2.4 For topside tanks of which the height is less than 6 m, alternative means as defined in paragraph 3.9 of the Technical Provisions or a portable means may be utilized in lieu of the permanent means of access.
Access to vertical structures 1.6 Permanent means of vertical access shall be provided in all cargo holds and built into the structure to allow for an inspection of a minimum of 25 % of the total number of hold frames port and starboard equally distributed throughout the hold including at each end in way of transverse bulkheads. But in no circumstance shall this arrangement be less than 3 permanent means of vertical access fitted to each side (fore and aft ends of hold and mid-span). Permanent means of vertical access fitted between two adjacent hold frames is counted for an access for the inspection of both hold frames. A means of portable access may be used to gain access over the sloping plating of lower hopper ballast tanks. 1.7 In addition, portable or movable means of access shall be utilized for access to the remaining hold frames up to their upper brackets and transverse bulkheads.	**Bilge hopper tanks** 2.5 For each bilge hopper tank of which the height is 6 m and over, one longitudinal continuous permanent means of access shall be provided along the side shell webs and installed at a minimum of 1.2 m below the top of the clear opening of the web ring with a vertical access ladder in the vicinity of each access to the tank. 2.5.1 An access ladder between the longitudinal continuous permanent means of access and the bottom of the space shall be provided at each end of the tank. 2.5.2 Alternatively, the longitudinal continuous permanent means of access can be located through the upper web plating above the clear opening of the web ring, at a minimum of 1.6 m below the deck head, when this arrangement facilitates more suitable inspection of identified structurally critical areas. An enlarged longitudinal frame can be used for the purpose of the walkway.

1.8 Portable or movable means of access may be utilized for access to hold frames up to their upper bracket in place of the permanent means required in 1.6. These means of access shall be carried on board the ship and readily available for use. 1.9 The width of vertical ladders for access to hold frames shall be at least 300 mm, measured between stringers. 1.10 A single vertical ladder over 6 m in length is acceptable for the inspection of the hold side frames in a single skin construction. 1.11 For double side skin construction no vertical ladders for the inspection of the cargo hold surfaces are required. Inspection of this structure should be provided from within the double hull space.	2.5.3 For double side skin bulk carriers the longitudinal continuous permanent means of access may be installed within 6 m from the knuckle point of the bilge, if used in combination with alternative methods to gain access to the knuckle point. 2.6 If no access holes are provided through the transverse ring webs within 600 mm of the tank base and the web frame rings have a web height greater than 1 m in way of side shell and sloping plating, then step rungs/grab rails shall be provided to allow safe access over each transverse web frame ring. 2.7 For bilge hopper tanks of which the height is less than 6 m, alternative means as defined in paragraph 3.9 of the Technical Provisions or a portable means may be utilized in lieu of the permanent means of access. Such means of access shall be demonstrated that they can be deployed and made readily available in the areas where needed. **Double skin side tanks** 2.8 Permanent means of access shall be provided in accordance with the applicable sections of table 1.
	Fore peak tanks 2.9 For fore peak tanks with a depth of 6 m or more at the centre line of the collision bulkhead, a suitable means of access shall be provided for access to critical areas such as the underdeck structure, stringers, collision bulkhead and side shell structure. 2.9.1 Stringers of less than 6 m in vertical distance from the deck head or a stringer immediately above are considered to provide suitable access in combination with portable means of access. 2.9.2 In case the vertical distance between the deck head and stringers, stringers or the lowest stringer and the tank bottom is 6 m or more, alternative means of access as defined in paragraph 3.9 of the Technical Provisions shall be provided.

* For ore carriers, permanent means of access shall be provided in accordance with the applicable sections of table 1 and table 2.