



SUB-COMMITTEE ON BULK LIQUIDS
AND GASES
8th session
Agenda item 5

BLG 8/5
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REVIEW OF ANNEX II OF MARPOL 73/78

Revised draft text of Annex II

Note by the Secretariat

SUMMARY

Executive summary: This document provides revised draft texts of the proposed new Annex II of MARPOL 73/78 for a *3-Category* and a *5-Category System*

Action to be taken: Paragraph 3.1

Related documents: BLG 7/5

1 Background

1.1 During MEPC 48, it was recognized that, if the revision of Annex II of MARPOL 73/78 was to be completed by the target date of 2003, a decision had to be made regarding the choice of Pollution Categorization Systems to be included as part of the text.

1.2 However, it was not possible to reach consensus on this issue and so the Secretariat was instructed to develop the remaining text of Annex II of MARPOL 73/78 for both a *3-Category* and a *5-Category System* for review by ESPH 8 and BLG 8 so that both texts could be finalized by the target completion date of 2003 and submitted to MEPC 49 for approval in the anticipation that a decision would be made regarding the choice of Pollution Categorization Systems.

2 Development of the revised text for Annex II of MARPOL 73/78

2.1 As instructed by MEPC 48, the Secretariat has prepared the revised text for Annex II of MARPOL 73/78 to accommodate both a *3-Category System* (as shown in appendix 1) and a *5-Category System* (as shown in appendix 2).

2.2 This work has been carried out with considerable assistance provided by Mrs M.C Tiemens-Idzinga (the Netherlands), Mr B. Okamura (Japan), Mr O. Nyquist (Norway) and Mr. A.A. Joose (the Netherlands) for which the Secretariat is most grateful.

For reasons of economy, this document is printed in a limited number. Delegates are kindly asked to bring their copies to meetings and not to request additional copies.

3 Action requested of the Sub-Committee

3.1 The Sub-Committee is invited to consider the text for both versions of Annex II of MARPOL 73/78 and make appropriate revisions, as deemed necessary, prior to submitting them to MEPC 49 for approval.

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APPENDIX 1

**REVISION OF ANNEX II
OF MARPOL 73/78
for a 3-Category system**

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ANNEX II OF MARPOL 73/78 (Revised)**Regulations for the control of pollution by Noxious Liquid Substances in bulk****CHAPTER 1 - GENERAL****Regulation 1 *Definitions***

For the purposes of this Annex:

1 *Anniversary date* means the day and the month of each year which will correspond to the date of expiry of the International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk.

2 *Associated piping* means the pipeline from the suction point in a cargo tank to the shore connection used for unloading the cargo and includes all ship's piping, pumps and filters which are in open connection with the cargo unloading line.

3 *Ballast water*

Clean ballast means ballast water carried in a tank which, since it was last used to carry a cargo containing a substance in Category X, Y or Z, has been thoroughly cleaned and the residues resulting there from have been discharged and the tank emptied in accordance with the appropriate requirements of this Annex.

Segregated ballast means ballast water introduced into a tank permanently allocated to the carriage of ballast or cargoes other than oil or Noxious Liquid Substances as variously defined in the Annexes of the present Convention, and which is completely separated from the cargo and oil fuel system.

4 *Chemical Codes*

Bulk Chemical Code means the Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC.20(22), as amended by the Organization, provided that such amendments are adopted and brought into force in accordance with the provisions of article 16 of the present Convention concerning amendment procedures applicable to an appendix to an Annex.

International Bulk Chemical Code means the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC.19(22), as amended by the Organization, provided that such amendments are adopted and brought into force in accordance with the provisions of article 16 of the present Convention concerning amendment procedures applicable to an appendix to an Annex.

- 5 *Chemical tanker* means a ship constructed or adapted primarily to carry a cargo of Noxious Liquid Substances in bulk and includes an "oil tanker" as defined in Annex I of the present Convention when certified to carry a cargo or part cargo of Noxious Liquid Substances in bulk.
- 6 *Depth of water* means the charted depth.
- 7 *En route* means that the ship is under way at sea on a course or courses, including deviation from the shortest direct route, which as far as practicable for navigational purposes, will cause any discharge to be spread over as great an area of the sea as is reasonable and practicable.
- 8 *Liquid substances* are those having a vapour pressure not exceeding 0.28 MPa absolute at a temperature of 37.8°C.
- 9 *Manual* means Procedures and Arrangements Manual in accordance with the model given in Appendix VI of this Annex.
- [10 *Miscible* means soluble or emulsifiable with water in all proportions at wash water temperatures.]^{*}
- 11 *Nearest land*. The term "from the nearest land" means from the baseline from which the territorial sea in question is established in accordance with international law, except that, for the purposes of the present Convention "from the nearest land off the north-eastern coast of Australia shall mean from the line drawn from a point on the coast of Australia in:

latitude 11°00' S, longitude 142°08' E
to a point in latitude 10°35' S, longitude 141°55' E,
thence to a point latitude 10°00' S, longitude 142°00' E,
thence to a point latitude 9°10' S, longitude 143°52' E,
thence to a point latitude 9°00' S, longitude 144°30' E,
thence to a point latitude 10°41' S, longitude 145°00' E,
thence to a point latitude 13°00' S, longitude 145°00' E,
thence to a point latitude 15°00' S, longitude 146°00' E,
thence to a point latitude 17°30' S, longitude 147°00' E,
thence to a point latitude 21°00' S, longitude 152°55' E,
thence to a point latitude 24°30' S, longitude 154°00' E,
thence to a point on the coast of Australia
in latitude 24°42' S, longitude 153°15' E.
- 12 *Noxious liquid substance* means any substance indicated in the Pollution Category column of chapter 17 or 18 of the International Bulk Chemical Code or provisionally assessed under the provisions of regulation 6.3 as falling into Category X, Y or Z.
- 13 *Residue* means any noxious liquid substance which remains for disposal.

* This definition may be deleted, because the use of word "miscible" is now outdated.

14 *Residue/water mixture* means residue to which water has been added for any purpose (e.g. tank cleaning, ballasting, bilge slops).

15 *Ship construction*

Ship constructed means a ship the keel of which is laid or which is at a similar stage of construction. A ship converted to a chemical tanker, irrespective of the date of construction, shall be treated as a chemical tanker constructed on the date on which such conversion commenced. This conversion provision shall not apply to the modification of a ship, which complies with all of the following conditions:

- .1 the ship is constructed before 1 July 1986; and
- .2 the ship is certified under the Bulk Chemical Code to carry only those products identified by the Code as substances with pollution hazards only.

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 tons or one per cent of the estimated mass of all structural material, whichever is less.

16 *Solidifying*

Solidifying substance means a noxious liquid substance which:

- .1 in the case of a substance with a melting point of less than 15°C which is at a temperature of less than 5°C above its melting point at the time of unloading; or
- .2 in the case of a substances with a melting point of equal to or greater than 15°C which is at a temperature of less than 10°C above its melting point at the time of unloading.

Non-solidifying substance means a noxious liquid substance, which is not a solidifying substance.

17 *Viscosity*

High-viscosity substance means a noxious liquid substance in Category X or Y with a viscosity equal to or greater than 50 mPa.s at the unloading temperature.

Low-viscosity substance means a noxious liquid substance, which is not a high viscosity substance.

Regulation 2 *Application*

- 1 Unless expressly provided otherwise the provisions of this Annex shall apply to all ships certified to carry Noxious Liquid Substances in bulk.
- 2 Where a cargo subject to the provisions of Annex I of the present Convention is certified to be carried in a cargo space of a chemical tanker, the appropriate requirements of Annex I of the present Convention shall also apply.
- [3 Regulation 11 of this Annex shall apply only to ships certified to carry substances, which are categorized for discharge control purposes in Category X or Y.]¹

Regulation 3 *Exceptions*

- 1 The discharge requirements of this Annex shall not apply to the discharge into the sea of Noxious Liquid Substances or mixtures containing such substances when such a discharge:
 - .1 is necessary for the purpose of securing the safety of a ship or saving life at sea; or
 - .2 results from damage to a ship or its equipment
 - .2.1 provided that all reasonable precautions have been taken after the occurrence of the damage or discovery of the discharge for the purpose of preventing or minimizing the discharge; and
 - .2.2 except if the owner or the master acted either with intent to cause damage, or recklessly and with knowledge that damage would probably result; or
 - .3 is approved by the Administration, when being used for the purpose of combating specific pollution incidents in order to minimize the damage from pollution. Any such discharge shall be subject to the approval of any Government in whose jurisdiction it is contemplated the discharge will occur.

Regulation 4 *Exemptions*

- 1 With respect to amendments to carriage requirements due to the upgrading of the categorization of a substance, the following shall apply:
 - .1 where an amendment to this Annex and the International Bulk Chemical Code and Bulk Chemical Code involves changes to the structure or equipment and fittings due to the upgrading of the requirements for the carriage of certain substances, the Administration may modify or delay for a specified period the application of such an amendment to ships constructed before the date of entry into force of that amendment, if the immediate application of such an amendment is considered unreasonable or impracticable. Such relaxation shall

¹ This paragraph could be deleted because the application of regulation 11 is clearly spelled out in that regulation.

be determined with respect to each substance, having regard to the guidelines developed by the Organization* ;

- .2 the Administration allowing a relaxation of the application of an amendment under this paragraph shall submit to the Organization a report giving details of the ship or ships concerned, the cargoes certified to carry, the trade in which each ship is engaged and the justification for the relaxation, for circulation to the Parties to the Convention for their information and appropriate action, if any and reflect the exemption on the Certificate as referred to in regulation 7 or 9 of this Annex.

2 Subject to the provisions of paragraph 3 of this regulation, the provisions of regulation 12.1 need not apply to a ship constructed before 1 July 1986 which is engaged in restricted voyages as determined by the Administration between:

- .1 ports or terminals within a State Party to the present Convention; or
- .2 ports or terminals of States Parties to the present Convention.

3 The provisions of paragraph 2 of this regulation shall only apply to a ship constructed before 1 July 1986 if:

- .1 each time a tank containing Category X, Y or Z substances or mixtures is to be washed or ballasted, the tank is washed in accordance with a prewash procedure approved by the Administration in compliance with Appendix VI of this Annex, and the tank washings are discharged to a reception facility;
- .2 subsequent washings or ballast water are discharged to a reception facility or at sea in accordance with other provisions of this Annex;
- .3 the adequacy of the reception facilities at the ports or terminals referred to above, for the purpose of this paragraph, is approved by the Governments of the States Parties to the present Convention within which such ports or terminals are situated;
- .4 in the case of ships engaged in voyages to ports or terminals under the jurisdiction of other States Parties to the present Convention, the Administration communicates to the Organization, for circulation to the Parties to the Convention, particulars of the exemption, for their information and appropriate action, if any; and
- .5 the certificate required under this Annex is endorsed to the effect that the ship is solely engaged in such restricted voyages.

* Reference is made to Guidelines for the application of amendments to the substances referred to in Chapters 17 and 18 of the International Bulk Chemical Code with respect to pollution hazards adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC.....(33).

4 For a ship whose constructional and operational features are such that ballasting of cargo tanks is not required and cargo tank washing is only required for repair or dry-docking, the Administration may allow exemption from the provisions of regulation 12, provided that all of the following conditions are complied with:

- .1 the design, construction and equipment of the ship are approved by the Administration, having regard to the service for which it is intended;
- .2 any effluent from tank washings which may be carried out before a repair or dry-docking is discharged to a reception facility, the adequacy of which is ascertained by the Administration;
- .3 the certificate required under this Annex indicates:
 - .3.1 that each cargo tank is certified for the carriage of a restricted number of substances which are comparable and can be carried alternately in the same tank without intermediate cleaning; and
 - .3.2 the particulars of the exemption;
- .4 the ship carries a Manual approved by the Administration; and
- .5 in the case of ships engaged in voyages to ports or terminals under the jurisdiction of other States Parties to the present Convention, the Administration communicates to the Organization, for circulation to the Parties to the Convention, particulars of the exemption, for their information and appropriate action, if any.

Regulation 5 *Equivalents*

1 The Administration may allow any fitting, material, appliance or apparatus to be fitted in a ship as an alternative to that required by this Annex if such fitting, material, appliance or apparatus is at least as effective as that required by this Annex. This authority of the Administration shall not extend to the substitution of operational methods to effect the control of discharge of Noxious Liquid Substances as equivalent to those design and construction features which are prescribed by regulations in this Annex.

2 The Administration, which allows a fitting, material, appliance or apparatus as alternative to that required by this Annex, under paragraph 1 of this regulation, shall communicate to the Organization for circulation to the Parties to the Convention, particulars thereof, for their information and appropriate action, if any.

3 Notwithstanding the provisions of paragraphs 1 and 2 of this regulation, the construction and equipment of liquefied gas carriers certified to carry Noxious Liquid Substances listed in the applicable Gas Carrier Code, shall be deemed to be equivalent to the construction and equipment requirements contained in regulations 11 and 12 of this Annex, provided that the gas carrier meets all following conditions:

- .1 hold a Certificate of Fitness in accordance with the appropriate Gas Carrier Code for ships certified to carry liquefied gases in bulk;

- .2 hold an International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk, in which it is certified that the gas carrier may carry only those Noxious Liquid Substances identified and listed in the appropriate Gas Carrier Code;
- .3 be provided with segregated ballast arrangements;
- .4 be provided with pumping and piping arrangements, which, to the satisfaction of the Administration, ensure that the quantity of cargo residue remaining in the tank and its associated piping after unloading does not exceed the applicable quantity of residue as required by regulation 12.1, 12.2 or 12.3.
- .5 be provided with a Manual, approved by the Administration, ensuring that no operational mixing of cargo residues and water will occur and that no cargo residues will remain in the tank after applying the ventilation procedures prescribed in the Manual.

CHAPTER 2 - CATEGORIZATION OF NOXIOUS LIQUID SUBSTANCES

Regulation 6 *Categorization and listing of Noxious Liquid Substances*

1 For the purpose of the regulations of this Annex, Noxious Liquid Substances shall be divided into three categories as follows:

- .1 Category X: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a major hazard to either marine resources or human health and, therefore, justify the prohibition of the discharge into the marine environment;
- .2 Category Y: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and therefore justify a limitation on the quality and quantity of the discharge into the marine environment;
- .3 Category Z: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a minor hazard to either marine resources or human health and therefore justify less stringent restrictions on the quality and quantity of the discharge into the marine environment;

2 Guidelines for use in the categorization of Noxious Liquid Substances are given in Appendix I to this Annex.

3 Where it is proposed to carry a liquid substance in bulk which has not been categorized under paragraph 1 of this regulation, the Governments of Parties to the Convention involved in the proposed operation shall establish and agree on a provisional assessment for the proposed operation on the basis of the guidelines referred to in paragraph 2 of this regulation. Until full agreement among the Governments involved has been reached, the substance shall not be carried. As soon as possible, but not later than 30 days after the agreement has been reached, the Government of the producing or shipping country, initiating the agreement concerned, shall notify the Organization and provide details of the substance and the provisional assessment for annual circulation to all Parties for their information. The Organization shall maintain a register of all such substances and their provisional assessment until such time as the substances are formally included in the IBC Code.

CHAPTER 3 - SURVEYS AND CERTIFICATION

Regulation 7 *Survey and certification of chemical tankers*

Notwithstanding the provisions of regulations 8, 9, and 10 of this Annex, chemical tankers which have been surveyed and certified by States Parties to the present Convention in accordance with the provisions of the International Bulk Chemical Code or the Bulk Chemical Code, as applicable, shall be deemed to have complied with the provisions of the said regulations, and the certificate issued under that Code shall have the same force and receive the same recognition as the certificate issued under regulation 9 of this Annex.

Regulation 8 *Surveys*

1 Ships carrying Noxious Liquid Substances in bulk shall be subject to the surveys specified below:

- .1 An initial survey before the ship is put in service or before the Certificate required under regulation 9 of this Annex is issued for the first time, and which shall include a complete survey of its structure, equipment, systems, fittings, arrangements and material in so far as the ship is covered by this Annex. This survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with the applicable requirements of this Annex.
- .2 A renewal survey at intervals specified by the Administration, but not exceeding 5 years, except where regulation 9.2, 9.5, 9.6 or 9.7 of this Annex is applicable. The renewal survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with applicable requirements of this Annex.
- .3 An intermediate survey within 3 months before or after the second anniversary date or within 3 months before or after the third anniversary date of the Certificate which shall take the place of one of the annual surveys specified in paragraph 1.4 of this regulation. The intermediate survey shall be such as to ensure that the equipment and associated pump and piping systems fully comply with the applicable requirements of this Annex and are in good working order. Such intermediate surveys shall be endorsed on the Certificate issued under regulation 9 of this Annex.
- .4 An annual survey within 3 months before or after each anniversary date of the Certificate including a general inspection of the structure, equipment, systems, fittings, arrangements and material referred to in paragraph 1.1 of this regulation to ensure that they have been maintained in accordance with paragraph 3 of this regulation and that they remain satisfactory for the service for which the ship is intended. Such annual surveys shall be endorsed on the Certificate issued under regulation 9 of this Annex.

- .5 An additional survey either general or partial, according to the circumstances, shall be made after a repair resulting from investigations prescribed in paragraph 3 of this regulation, or whenever any important repairs or renewals are made. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory and that the ship complies in all respects with the requirements of this Annex.

2.1 Surveys of ships, as regards the enforcement of the provisions of this Annex, shall be carried out by officers of the Administration. The Administration may, however, entrust the surveys either to surveyors nominated for the purpose or to organizations recognized by it.

2.2 The Organization, referred to in paragraph 2.1 of this paragraph shall comply with the Guidelines adopted by the Organization by resolution A.739(18), as may be amended by the Organization, and the specification adopted by the Organization by resolution A.789.(19), 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 16 of the present Convention concerning the amendment procedures applicable to this Annex.

2.3 An Administration nominating surveyors or recognizing organizations to conduct surveys as set forth in paragraph 2.1 of this regulation shall, as a minimum, empower any nominated surveyor or recognized organization to:

- .1 require repairs to a ship; and
- .2 carry out surveys if requested by the appropriate authorities of a port State.

2.3.1 The Administration shall notify the Organization of the specific responsibilities and conditions of the authority delegated to the nominated surveyors or recognized organizations, for circulation to Parties to the present Convention for the information of their officers.

2.4 When a nominated surveyor or recognized organization determines that the condition of the ship or its equipment does not correspond substantially with the particulars of the Certificate, or is such that the ship is not fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment, such surveyor or organization shall immediately ensure that corrective action is taken and shall in due course notify the Administration. If such corrective action is not taken the Certificate should be withdrawn and the Administration shall be notified immediately, and if the ship is in a port of another Party, the appropriate authorities of the port State shall also be notified immediately. When an officer of the Administration, a nominated surveyor or a recognized organization has notified the appropriate authorities of the port State, the Government of the port State concerned shall give such officer, surveyor or organization any necessary assistance to carry out their obligations under this regulation. When applicable, the Government of the port State concerned shall take such steps as will ensure that the ship shall not sail until it can proceed to sea or leave the port for the purpose of proceeding to the nearest appropriate repair yard available without presenting an unreasonable threat of harm to the marine environment.

2.5 In every case, the Administration concerned shall fully guarantee the completeness and efficiency of the survey and shall undertake to ensure the necessary arrangements to satisfy this obligation.

3.1 The condition of the ship and its equipment shall be maintained to conform with the provisions of the present Convention to ensure that the ship in all respects will remain fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment.

3.2 After any survey of the ship required under paragraph 1 of this regulation has been completed, no change shall be made in the structure, equipment, systems, fittings, arrangements or material covered by the survey, without the sanction of the Administration, except the direct replacement of such equipment and fittings.

3.3 Whenever an accident occurs to a ship or a defect is discovered which substantially affects the integrity of the ship or the efficiency or completeness of its equipment covered by this Annex, the master or owner of the ship shall report at the earliest opportunity to the Administration, the recognized organization or the nominated surveyor responsible for issuing the relevant Certificate, who shall cause investigations to be initiated to determine whether a survey as required by paragraph 1 of this regulation is necessary. If the ship is in a port of another Party, the master or owner shall also report immediately to the appropriate authorities of the port State and the nominated surveyor or recognized organization shall ascertain that such report has been made.”

Regulation 9 *Issue or endorsement of Certificate*

1 An International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk shall be issued, after an initial or renewal survey in accordance with the provisions of regulation 8 of this Annex, to any ship carrying Noxious Liquid Substances in bulk and which is engaged in voyages to ports or terminals under the jurisdiction of other Parties to the Convention.

2 Such Certificate shall be issued or endorsed either by the Administration or by any person or organization duly authorized by it. In every case, the Administration assumes full responsibility for the Certificate.

3.1 The Government of a Party to the Convention may, at the request of the Administration, cause a ship to be surveyed and, if satisfied that the provisions of this Annex are complied with, shall issue or authorize the issue of an International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk to the ship and, where appropriate, endorse or authorize the endorsement of that Certificate on the ship, in accordance with this Annex.

3.2 A copy of the Certificate and a copy of the survey report shall be transmitted as soon as possible to the requesting Administration.

3.3 A Certificate so issued shall contain a statement to the effect that it has been issued at the request of the Administration and it shall have the same force and receive the same recognition as the Certificate issued under paragraph 1 of this regulation.

3.4 No International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk shall be issued to a ship, which is entitled to fly the flag of a State which is not a party.

4 The International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk shall be drawn up in the form corresponding to the model given in Appendix V to this Annex and shall be at least in English, French or Spanish. Where entries in an official national language of the State whose flag the ship is entitled to fly are also used, this shall prevail in the case of a dispute or discrepancy.

Regulation 10 *Duration and validity of Certificate*

1 An International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk shall be issued for a period specified by the Administration which shall not exceed 5 years.

2.1 Notwithstanding the requirements of paragraph 1 of this regulation, when the renewal survey is completed within 3 months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of expiry of the existing Certificate.

2.2 When the renewal survey is completed after the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of expiry of the existing Certificate.

2.3 When the renewal survey is completed more than 3 months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of completion of the renewal survey.

3 If a Certificate is issued for a period of less than 5 years, the Administration may extend the validity of the Certificate beyond the expiry date to the maximum period specified in paragraph 1 of this regulation, provided that the surveys referred to in regulation 8.1.3 and 8.1.4 of this Annex applicable when a Certificate is issued for a period of 5 years are carried out as appropriate.

4 If a renewal survey has been completed and a new Certificate cannot be issued or placed on board the ship before the expiry date of the existing Certificate, the person or organization authorized by the Administration may endorse the existing Certificate and such a Certificate shall be accepted as valid for a further period which shall not exceed 5 months from the expiry date.

5 If a ship at the time when a Certificate expires is not in a port in which it is to be surveyed, the Administration may extend the period of validity of the Certificate but this extension shall be granted only for the purpose of allowing the ship to complete its voyage to the port in which it is to be surveyed, and then only in cases where it appears proper and reasonable to do so. No Certificates shall be extended for a period longer than 3 months, and a ship to which an extension is granted shall not, on its arrival in the port in which it is to be surveyed, be entitled by virtue of such extension to leave that port without having a new Certificate. When the renewal survey is completed, the new Certificate shall be valid to a date not exceeding 5 years from the date of expiry of the existing Certificate before the extension was granted.

6 A Certificate issued to a ship engaged on short voyages which has not been extended under the foregoing provisions of this regulation may be extended by the Administration for a period of grace of up to one month from the date of expiry stated on it. When the renewal survey is completed, the new Certificate shall be valid to a date not exceeding 5 years from the date of expiry of the existing Certificate before the extension was granted.

7 In special circumstances, as determined by the Administration, a new Certificate need not be dated from the date of expiry of the existing Certificate as required by paragraph 2.2, 5 or 6 of this regulation. In these special circumstances, the new Certificate shall be valid to a date not exceeding 5 years from the date of completion of the renewal survey.

8 If an annual or intermediate survey is completed before the period specified in regulation 8 of this Annex, then:

- .1 the anniversary date shown on the Certificate shall be amended by endorsement to a date which shall not be more than 3 months later than the date on which the survey was completed;
- .2 the subsequent annual or intermediate survey required by regulation 8 of this Annex shall be completed at the intervals prescribed by that regulation using the new anniversary date;
- .3 the expiry date may remain unchanged provided one or more annual or intermediate surveys, as appropriate, are carried out so that the maximum intervals between the surveys prescribed by regulation 8 of this Annex are not exceeded.

9 A Certificate issued under regulation 9 of this Annex shall cease to be valid in any of the following cases:

- .1 if the relevant surveys are not completed within the periods specified under regulation 8.1 of this Annex;
- .2 if the Certificate is not endorsed in accordance with regulation 8.1.3 or 8.1.4 of this Annex;
- .3 upon transfer of the ship to the flag of another State. A new Certificate shall only be issued when the Government issuing the new Certificate is fully satisfied that the ship is in compliance with the requirements of regulation 8.3.1 and 8.3.2 of this Annex. In the case of a transfer between Parties, if requested within 3 months after the transfer has taken place, the Government of the Party whose flag the ship was formerly entitled to fly shall, as soon as possible, transmit to the Administration copies of the Certificate carried by the ship before the transfer and, if available, copies of the relevant survey reports.

CHAPTER 4 DESIGN, CONSTRUCTION, ARRANGEMENT AND EQUIPMENT

Regulation 11 *Design, construction, equipment and operations*

1 The design, construction, equipment and operation of ships certified to carry Noxious Liquid Substances of Category X or Y in bulk, shall be in compliance with the following provisions to minimize the uncontrolled discharge into the sea of such substances:

- .1 the International Bulk Chemical Code when the chemical tanker is constructed on or after 1 July 1986; or
- .2 the Bulk Chemical Code as referred to in paragraph 1.7.2 of that Code for:
 - .2.1 ships for which the building contract is placed on or after 2 November 1973 but constructed before 1 July 1986, and which are engaged on voyages to ports or terminals under the jurisdiction of other States Parties to the Convention; and
 - .2.2 ships constructed on or after 1 July 1983 but before 1 July 1986, which are engaged solely on voyages between ports or terminals within the State the flag of which the ship is entitled to fly.
- .3 The Bulk Chemical Code as referred to in paragraph 1.7.3 of that Code for:
 - .3.1 ships for which the building contract is placed before 2 November 1973 and which are engaged on voyages to ports or terminals under the jurisdiction of other States Parties to the Convention; and
 - .3.2 ships constructed before 1 July 1983, which are solely engaged on, voyages between ports or terminals within the State the flag of which the ship is entitled to fly.

2 In respect of ships other than chemical tankers certified to carry Noxious Liquid Substances of Category X or Y in bulk, the Administration shall establish appropriate measures based on the Guidelines* developed by the Organization in order to ensure that the provisions shall be such as to minimize the uncontrolled discharge into the sea of such substances.

Regulation 12 *Pumping, piping, unloading arrangements and slop tanks.*

1 Every ship constructed before 1 July 1986 shall be provided with a pumping and piping arrangement to ensure that each tank certified for the carriage of substances in Category X or Y does not retain a quantity of residue in excess of 300 litres in the tank and its associated piping and that each tank certified for the carriage of substances in Category Z does not retain a quantity of residue in excess of 900 litres in the tank and its associated piping. A performance test shall be carried out in accordance with Appendix V of this Annex.

* Reference is made to Resolution A.673(16).

2 Every ship constructed on or after 1 July 1986 but before 1 January 2007 shall be provided with a pumping and piping arrangement to ensure that each tank certified for the carriage of substances in Category X or Y does not retain a quantity of residue in excess of 100 litres in the tank and its associated piping and that each tank certified for the carriage of substances in Category Z does not retain a quantity of residue in excess of 300 litres in the tank and its associated piping. A performance test shall be carried out in accordance with Appendix V of this Annex.

3 Every ship constructed on or after 1 January 2007 shall be provided with a pumping and piping arrangement to ensure that each tank certified for the carriage of substances in Category X, Y or Z does not retain a quantity of residue in excess of 75 litres in the tank and its associated piping. A performance test shall be carried out in accordance with Appendix V of this Annex.

4 For a ship other than a chemical tanker constructed before 1 January 2007 which cannot meet the requirements for the pumping and piping arrangements for substances in Category Z referred to in paragraphs 1 and 2 of this regulation no quantity requirement shall apply. Compliance is deemed to be reached if the tank is emptied to the most practicable extent.

5 Pumping performance tests and conditions referred to in paragraphs 1, 2 and 3 of this regulation shall be approved by the Administration.

6 Every ship certified to carry substances of Category X, Y or Z shall have an underwater discharge outlet (or outlets) located within the cargo area in the vicinity of the turn of the bilge, and so arranged as to avoid the re-intake of residue/water mixtures by the ship's seawater intakes.

7 For ships constructed before 1 January 2007 and certified to carry substances in Category Z an underwater discharge outlet as required under paragraph 6 of this regulation is not mandatory.

8 The underwater discharge outlet arrangement shall be such that the residue/water mixture discharged into the sea will not pass through the ship's boundary layer. To this end, when the discharge is made normal to the ship's shell plating, the minimum diameter of the discharge outlet is governed by the following equation:

$$d = \frac{Q_d}{5L_d}$$

where:

d = minimum diameter of the discharge outlet (m)

L_d = distance from the forward perpendicular to the discharge outlet (m)

Q_d = the maximum rate selected at which the ship may discharge a residue/water mixture through the outlet (m³/h).

9 When the discharge is directed at an angle to the ship's shell plating, the above relationship should be modified by substituting for Q_d the component of Q_d which is normal to the ship's shell plating.

10 *Slop tanks*

Although this Annex does not require the fitting of dedicated slop tanks, slop tanks may be needed for certain washing procedures. Cargo tanks may be used as slop tanks.

CHAPTER 5 - OPERATIONAL DISCHARGES OF RESIDUES OF NOXIOUS LIQUID SUBSTANCES

Regulation 13 *Control of discharges of residues of Noxious Liquid Substances*

Subject to the provisions of regulation 3 of this Annex the control of Noxious Liquid Substances or ballast water, tank washings or other mixtures containing such substances shall be in compliance with the following requirements.

GENERAL PROVISIONS IN ALL AREAS

1 *Discharge provisions*

1.1 The discharge into the sea of residues of substances assigned to Category X, Y or Z or of those provisionally assessed as such or ballast water, tank washings or other mixtures containing such substances shall be prohibited unless such discharges are made in full compliance with the applicable operational requirements contained in this Annex.

1.2 Before any prewash or discharge procedure is carried out in accordance with this regulation, all applicable tanks shall be unloaded in accordance with the procedures and arrangements prescribed in the Manual.

1.3 The carriage of substances which have not been categorized, provisionally assessed or evaluated as referred to in regulation 6 of this Annex or of ballast water, tank washings or other mixtures containing such residues shall be prohibited along with any consequential discharge of such substances into the sea.

2 *Discharge standards*

2.1 Where the provisions in this regulation allow the discharge into the sea of residues of substances in Category X, Y or Z or of those provisionally assessed as such or ballast water, tank washings or other mixtures containing such substances the following discharge standards shall apply:

- .1 the ship is proceeding en route at a speed of at least 7 knots in the case of self-propelled ships or at least 4 knots in the case of ships which are not self-propelled;
- .2 the discharge is made below the waterline through the underwater discharge outlet(s) not exceeding the maximum rate for which the underwater discharge outlet(s) is (are) designed; and
- .3 the discharge is made at a distance of not less than 12 nautical miles from the nearest land in a depth of water of not less than 25 metres.

2.2 For ships constructed before 1 January 2007 the discharge into the sea of residues of substances in Category Z or of those provisionally assessed as such or ballast water, tank washings or other mixtures containing such substances below the waterline is not mandatory.

2.3 The Administration may waive the requirements of paragraph 2.1.3 for substances in Category Z, regarding the distance of not less than 12 nautical miles from the nearest land for ships solely engaged in voyages within waters subject to the sovereignty or jurisdiction of the State the flag of which the ship is entitled to fly.

3 *Ventilation of cargo residues*

Ventilation procedures approved by the Administration may be used to remove cargo residues from a tank. Such procedures shall be in accordance with Appendix VII of this Annex. Any water subsequently introduced into the tank shall be regarded as clean and shall not be subject to the discharge requirements in this Annex.

4 *Exemption for a prewash*

On request of the ship's master an exemption for a prewash may be granted by the Government of the receiving Party, where it is satisfied that:

- .1 the unloaded tank is to be reloaded with the same substance or another substance compatible with the previous one and that the tank will not be washed or ballasted prior to loading; or
- .2 The unloaded tank is neither washed nor ballasted at sea and the prewash in accordance with the applicable paragraph of this regulation shall be carried out at another port provided that it has been confirmed in writing that a reception facility at that port is available and is adequate for such a purpose; or
- .3 the cargo residues will be removed by a ventilation procedure approved by the Administration in accordance with Appendix VII of this Annex.

5 *The use of cleaning agents or additives*

5.1 When a washing medium other than water, such as mineral oil or chlorinated solvent, is used instead of water to wash a tank, its discharge shall be governed by the provisions of either Annex I or Annex II, which would apply to the medium had it been carried as cargo. Tank washing procedures involving the use of such a medium shall be set out in the Manual and be approved by the Administration.

5.2 When small amounts of cleaning additives (detergent products) are added to water in order to facilitate tank washing, no additives containing Pollution Category X components shall be used except those components that are readily biodegradable and present in a total concentration of less than 10% of the cleaning additive. No restrictions additional to those applicable to the tank due to the previous cargo shall apply.

6 *Responsibilities of the master*

The master shall ensure that no discharges into the sea of cargo residues or residue/water mixtures containing substances in Category X, Y or Z take place, unless such discharges are made in full compliance with the operational procedures contained in the Manual.

DISCHARGE OF RESIDUES

Subject to the provisions of paragraph 1 the following provisions shall apply:

7 *Category X*

7.1 A tank, which has been unloaded, shall be prewashed before the ship leaves the port of unloading. The resulting residues shall be discharged to a reception facility until the concentration of the substance in the effluent to such facility, as indicated by analyses of samples of the effluent taken by the surveyor, is at or below 0.1% by weight. When the required concentration level has been achieved, remaining tank washings shall continue to be discharged to the reception facility until the tank is empty. Appropriate entries of these operations shall be made in the Cargo Record Book and endorsed by the surveyor referred to in regulation 16.1.

7.2 Any water subsequently introduced into the tank may be discharged into the sea in accordance with the discharge standards in paragraph 2 of this regulation.

7.3 Where the Government of the receiving party is satisfied that it is impracticable to measure the concentration of the substance in the effluent without causing undue delay to the ship, that Party may accept an alternative procedure as being equivalent to obtain the required concentration in paragraph 7.1 of this regulation provided that:

- .1 the tank is prewashed in accordance with a procedure approved by the Administration in compliance with Appendix VI of this Annex; and
- .2 appropriate entries shall be made in the Cargo Record Book and endorsed by the surveyor referred to in regulation 16.1.

8 *Category Y and Z*

8.1 With respect to the residue discharge procedures for substances in Category Y or Z the discharge standards in paragraph 2 of this regulation shall apply.

8.2 If the unloading of a substance of Category Y or Z is not carried out in accordance with the Manual, a prewash shall be carried out before the ship leaves the port of unloading, unless alternative measures are taken to the satisfaction of the surveyor referred to in regulation 16. 1 of this Annex to remove the cargo residues from the ship to quantities specified in this Annex. The resulting tank washings of the prewash shall be discharged to a reception facility at the port of unloading or another port with a suitable reception facility provided that it has been confirmed in writing that a reception facility at that port is available and is adequate for such a purpose.

8.3 With respect to the prewash and residue discharge procedures for high-viscosity or solidifying substances in Category Y the following shall apply:

- .1 a prewash procedure as specified in Appendix VI shall be applied;
- .2 the residue/water mixture generated during the prewash shall be discharged to a reception facility [until the tank is empty]; and
- .3 any water subsequently introduced into the tank may be discharged into the sea in accordance with the discharge standards in paragraph 2 of this regulation.

9 *Operational requirements for ballasting and deballasting*

9.1 After unloading, and, if required, after a prewash, a cargo tank may be ballasted. Procedures for the discharge of such ballast are set out in paragraph 2 of this regulation.

9.2 Ballast introduced into a cargo tank which has been washed to such an extent that the ballast contains less than 1 ppm of the substance previously carried, may be discharged into the sea without regard to the discharge rate, ship's speed and discharge outlet location, provided that the ship is not less than 12 miles from the nearest land and in water that is not less than 25 metres deep. The required degree of cleanliness has been achieved when a prewash as specified in Appendix VI has been carried out and the tank has been subsequently washed with a complete cycle of the cleaning machine.

9.3 The discharge into the sea of clean or segregated ballast shall not be subject to the requirements of this Annex.

DISCHARGE OF RESIDUES WITHIN SPECIAL AREAS

10 *Discharges in the Antarctic area*

10.1 *Antarctic Area* means the sea area south of latitude 60°S.

10.2 In the Antarctic area any discharge into the sea of Noxious Liquid Substances or mixtures containing such substances is prohibited.

Regulation 14 *Procedures and Arrangements Manual*

1 Every ship certified to carry substances of Category X, Y or Z shall have on board a Manual approved by the Administration. The Manual shall have a standard format in compliance with Appendix IV to this Annex. In the case of a ship engaged in international voyages and the language used is not English, French or Spanish, the text shall include a translation into one of these languages.

2 The main purpose of the Manual is to identify for the ship's officers the physical arrangements and all the operational procedures with respect to cargo handling, tank cleaning, slops handling and cargo tank ballasting and deballasting which must be followed in order to comply with the requirements of this Annex.

Regulation 15 *Cargo record book*

1 Every ship to which this Annex applies shall be provided with a Cargo Record Book, whether as part of the ship's official logbook or otherwise, in the form specified in Appendix II to this Annex.

2 After completion of any cargo discharge or ballasting operation, this procedure shall be recorded in the Cargo Record Book.

3 In the event of an accidental discharge of a noxious liquid substance or a mixture containing such a substance or a discharge under the provisions of regulation 3 of this Annex, an

entry shall be made in the Cargo Record Book stating the circumstances of, and the reason for, the discharge.

4 Each entry shall be signed by the officer or officers in charge of the operation concerned and each page shall be signed by the master of the ship. The entries in the Cargo Record Book, for ships holding an International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk or a certificate referred to in regulation 7 of this Annex shall be at least in English, French or Spanish. Where entries in an official national language of the State whose flag the ship is entitled to fly are also used, this shall prevail in case of a dispute or discrepancy.

5 The Cargo Record Book shall be kept in such a place as to be readily available for inspection and, except in the case of unmanned ships under tow, shall be kept on board the ship. It shall be retained for a period of three years after the last entry has been made.

6 The competent authority of the Government of a Party may inspect the Cargo Record Book on board any ship to which this Annex applies while the ship is in its port, and may make a copy of any entry in that book and may require the master of the ship to certify that the copy is a true copy of such entry. Any copy so made which has been certified by the master of the ship as a true copy of an entry in the ship's Cargo Record Book shall be made admissible in any judicial proceedings as evidence of the facts stated in the entry. The inspection of a Cargo Record Book and the taking of a certified copy by the competent authority under this paragraph shall be performed as expeditiously as possible without causing the ship to be unduly delayed.

CHAPTER 6 - MEASURES OF CONTROL BY PORT STATES

Regulation 16 *Measures of control*

1 The Government of each Party to the Convention shall appoint or authorize surveyors for the purpose of implementing this regulation. The surveyors shall execute control in accordance with control procedures developed by the Organization.

2 When a surveyor appointed or authorized by the Government of the Party to the Convention has verified that an operation has been carried out in accordance with the requirements of this Annex, or has granted an exemption for a prewash, then that surveyor shall make an appropriate entry in the Cargo Record Book.

3 The master of a ship certified to carry Noxious Liquid Substances in bulk shall ensure that the provisions of Regulation 13 and of this regulation have been complied with and that the Cargo Record Book is completed in accordance with Regulation 15 of this Annex whenever operations as referred to in that regulation take place.

4 A tank which has carried a Category X substance shall be prewashed in accordance with regulation 13.7. The appropriate entries of these operations shall be made in the Cargo Record Book and endorsed by the surveyor referred to under paragraph 1 of this regulation.

5 Where the Government of the receiving party is satisfied that it is impracticable to measure the concentration of the substance in the effluent without causing undue delay to the ship, that Party may accept the alternative procedure referred to in regulation 13.7.3 of this Annex provided that the surveyor referred to under paragraph 1 of this regulation certifies in the Cargo Record Book that:

- .1 the tank, its pump and piping systems have been emptied; and
- .2 the prewash has been carried out in accordance with the provisions of Appendix VI of this Annex; and
- .3 the tank washing resulting from such prewash have been discharged to a reception facility and the tank is empty.

6 At the request of the ship's master, the Government of the receiving Party may exempt the ship from the requirements for a prewash referred to in the applicable paragraphs of regulation 13 of this Annex, when one of the conditions of regulation 13.4 is met.

7 An exemption referred to in paragraph 6 of this regulation may only be granted by the Government of the receiving Party to a ship engaged in voyages to ports or terminals under the jurisdiction of other States Parties to the present Convention. When such an exemption has been granted, the appropriate entry made in the Cargo Record Book shall be endorsed by the surveyor referred to in paragraph 1 of this regulation.

8 If the unloading is not carried out in accordance with the pumping conditions for the tank approved by the Administrations and based on Appendix V of this Annex, alternative measures may be taken to the satisfaction of the surveyor referred to in paragraph 1 of this regulation to remove the cargo residues from the ship to quantities specified in regulation 12 of this Annex as applicable. The appropriate entries shall be made in the Cargo Record Book.

9 *Port State control on operational requirements**

9.1 A ship when in a port of another Party is subject to inspection by officers duly authorized by such Party concerning operational requirements under this Annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by Noxious Liquid Substances.

9.2 In the circumstances given in paragraph 9.1 of this regulation, the Party shall take such steps as will ensure that the ship shall not sail until the situation has been brought to order in accordance with the requirements of this Annex.

9.3 Procedures relating to the port State control prescribed in article 5 of the present Convention shall apply to this regulation.

9.4 Nothing in this regulation shall be construed to limit the rights and obligations of a Party carrying out control over operational requirements specifically provided for in the present Convention.

* Refer to the Procedures for port State control adopted by the Organization by resolution A.787(19); see IMO sales publication IMO-650E.

CHAPTER 7 - PREVENTION OF POLLUTION ARISING FROM AN INCIDENT INVOLVING NOXIOUS LIQUID SUBSTANCES

Regulation 17 *Shipboard marine pollution emergency plan for Noxious Liquid Substances.*

1 Every ship of 150 gross tonnage and above certified to carry Noxious Liquid Substances in bulk shall carry on board a shipboard marine pollution emergency plan for Noxious Liquid Substances approved by the Administration.

2 Such a plan shall be based on the Guidelines* developed by the Organization and written in a working language or languages understood by the master and officers. The plan shall consist at least of:

- .1 the procedure to be followed by the master or other persons having charge of the ship to report a Noxious Liquid Substances pollution incident, as required in article 8 and Protocol I of the present Convention, based on the Guidelines developed by the Organization**;
- .2 the list of authorities or persons to be contacted in the event of a Noxious Liquid Substances pollution incident;
- .3 a detailed description of the action to be taken immediately by persons on board to reduce or control the discharge of Noxious Liquid Substances following the incident; and
- .4 the procedures and point of contact on the ship for co-ordinating shipboard action with national and local authorities in combating the pollution.

3 In the case of ships to which regulation 35 of Annex I of the Convention also apply, such a plan may be combined with the shipboard oil pollution emergency plan required under regulation 35 of Annex I of the Convention. In this case, the title of such a plan shall be “Shipboard marine pollution emergency plan”.

* Refer to “Guidelines for the development of shipboard marine pollution emergency plans for oil and/or Noxious Liquid Substances” adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC.54(32), as amended by resolution MEPC.86 (44).

** Refer to General Principles for Ship Reporting Systems and Ship Reporting Requirements, including Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants adopted by the Organization by resolution A.851(20).

CHAPTER 8 - RECEPTION FACILITIES

Regulation 18 Reception facilities and cargo unloading terminal arrangements

1 The Government of each Party to the Convention undertakes to ensure the provision of reception facilities according to the needs of ships using its ports, terminals or repair ports as follows:

- .1 Ports and terminals involved in ships' cargo handling shall have adequate facilities for the reception of residues and mixtures containing such residues of Noxious Liquid Substances resulting from compliance with this Annex, without undue delay for the ships involved.
- .2 ship repair ports undertaking repairs to chemical tankers shall have facilities adequate for the reception of residues and mixtures containing Noxious Liquid Substances for ships calling at that port.

2 The Government of each Party shall determine the types of facilities provided for the purpose of paragraph 1 of this regulation at each cargo loading and unloading port, terminal and ship repair port in its territories and notify the Organization thereof.

3 The Governments of Parties to the Convention, the coastlines of which border on any given special area, shall collectively agree and establish a date by which time the requirement of paragraph 1 of this regulation will be fulfilled and from which the requirements of the applicable paragraphs of regulation 13 in respect of that area shall take effect and notify the Organization of the date so established at least six months in advance of that date. The Organization shall then promptly notify all Parties of that date.

4 The Government of each Party to the Convention shall undertake to ensure that cargo unloading terminals shall provide arrangements to facilitate stripping of cargo tanks of ships unloading Noxious Liquid Substances at these terminals. Cargo hoses and piping systems of the terminal, containing Noxious Liquid Substances received from ships unloading these substances at the terminal, shall not be drained back to the ship.

5 Each Party shall notify the Organization, for transmission to the Parties concerned, of any case where facilities required under paragraph 1 or arrangements required under paragraph 3 of this regulation are alleged to be inadequate.

Appendices to annex II

APPENDIX I

GUIDELINES FOR THE CATEGORIZATION OF NOXIOUS LIQUID SUBSTANCES

Products are assigned to Pollution Categories based on an evaluation of their properties as reflected in the resultant GESAMP Hazard Profile as shown in the table below:

Rule	A1 Bio- accumulation	A2 Bio- degradation	B1 Acute toxicity	B2 Chronic toxicity	D3 Long-term health effects	E2 Effects on marine wildlife and on benthic habitats	Cat
1			≥ 5				X
2	≥ 4		4				
3		NR	4				
4	≥ 4	NR			CMRTNI		
5			4				Y
6			3				
7			2				
8	≥ 4	NR		Not 0			
9				≥ 1			
10						F or S If not Inorganic	
11					CMRTNI		
12	All other products						Z

Abbreviated legend to the revised GESAMP Hazard Evaluation Procedure

Columns A and B - Aquatic Environment					
	A		B		
	Bioaccumulation and Biodegradation		Aquatic Toxicity		
Numerical Rating	A 1 Bioaccumulation		A 2 Biodegradation	B 1 Acute Toxicity	B 2 Chronic Toxicity
	log Pow	BCF		LC/EC/IC ₅₀ (mg/l)	NOEC (mg/l)
0	<1 or > ca. 7	not measurable	R: readily biodegradable NR: not readily biodegradable	>1000	>1
1	≥1 - <2	≥1 - <10		>100 - ≤1000	>0.1 - ≤1
2	≥2 - <3	≥10 - <100		>10 - ≤100	>0.01 - ≤0.1
3	≥3 - <4	≥100 - <500		>1 - ≤10	>0.001 - ≤0.01
4	≥4 - <5	≥500 - <4000		>0.1 - ≤1	≤0.001
5	≥5	≥4000		>0.01 - ≤0.1	
6				≤0.01	

Columns C and D - Human Health (Toxic effects to mammals)						
	C			D		
	Acute Mammalian Toxicity			Irritation, Corrosion & Long term health effects		
Numerical Ratings	C 1 Oral Toxicity LD ₅₀ (mg/kg)	C 2 Percutaneous Toxicity LD ₅₀ (mg/kg)	C 3 Inhalation Toxicity LC ₅₀ (mg/l)	D 1 Skin irritation & corrosion	D 2 Eye irritation & corrosion	D 3 Long term health effects
0	>2000	>2000	>20	not irritating	not irritating	C - Carcinogen M - Mutagenic R - Reprotoxic S - Sensitizing A -Aspiration haz. T - Target organ systemic toxicity L - Lung injury N - Neurotoxic I - Immunotoxic
1	>300 - ≤2000	>1000 - ≤2000	>10 - ≤20	mildly irritating	mildly irritating	
2	>50 - ≤300	>200 - ≤1000	>2 - ≤10	irritating	irritating	
3	>5 - ≤50	>50 - ≤200	>0.5 - ≤2	3 Severely irritating or corrosive 3A Corr. (≤4hr) 3B Corr. (≤1hr) 3C Corr. (≤3m)	severely irritating	
4	≤5	≤50	≤0.5			

Column E Interferences with other Uses of the Sea			
E 1 Tainting	E 2 Physical effects on Wildlife & benthic habitats	E 3 Interference with Coastal Amenities	
		Numerical Rating	Description & Action
NT: not tainting (tested) T: tainting test positive	Ep: Persistent Floater E: Floater S: Sinking Substances	0	no interference no warning
		1	slightly objectionable warning, no closure of amenity
		2	moderately objectionable possible closure of amenity
		3	highly objectionable closure of amenity

APPENDIX II

**FORM OF CARGO RECORD BOOK FOR SHIPS CARRYING
NOXIOUS LIQUID SUBSTANCES IN BULK**

**CARGO RECORD BOOK FOR SHIPS
CARRYING NOXIOUS LIQUID SUBSTANCES IN BULK**

Name of ship.....

Distinctive number or letters.....

IMO Number.....

Gross tonnage.....

Period from.....to.....

INTRODUCTION

The following pages show a comprehensive list of items of cargo and ballast operations which are, when appropriate, to be recorded in the Cargo Record Book on a tank to tank basis in accordance with regulation 15.2 of Annex II of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), as amended. The items have been grouped into operational sections, each of which is denoted by a letter.

When making entries in the Cargo Record Book, the date, operational code and item number shall be inserted in the appropriate columns and the required particulars shall be recorded chronologically in the blank spaces

Each completed operation shall be signed for and dated by the officer or officers in charge and, if applicable, by a surveyor authorized by the competent authority of the State in which the ship is unloading. Each completed page shall be countersigned by the master of the ship.

Entries in the Cargo Record Book are required for operations involving substances of all Pollution Categories.

For the Category of a substance, refer to table 1 of the ship's Procedures and Arrangements Manual.

List of items to be recorded

Entries are required for operations involving all Categories of substances.

(A) Loading of cargo

- 1 Place of loading.
- 2 Identify tank(s), name of substance(s) and Category(ies).

(B) Internal transfer of cargo

- 3 Name and Category of cargo(es) transferred.
- 4 Identity of tanks:
 - .1 from :
 - .2 to :
- 5 Was (were) tank(s) in 4.1 emptied?
- 6 If not, quantity remaining in tank(s).

(C) Unloading of cargo

- 7 Place of unloading.
- 8 Identity of tank(s) unloaded.
- 9 Was (were) tank(s) emptied?
 - .1 If yes, confirm that the procedure for emptying and stripping has been performed in accordance with the ship's Procedures and Arrangements Manual (i.e. list, trim, stripping temperature).
 - .2 If not, quantity remaining in tank(s).
10. Does the ship's Procedures and Arrangements Manual require a prewash with subsequent disposal to reception facilities?
- 10 Does the ship's Procedures and Arrangements Manual require a prewash with subsequent disposal to reception facilities
- 11 Failure of pumping and/or stripping system:
 - .1 time and nature of failure;
 - .2 reasons for failure;
 - .3 time when system has been made operational.

(D) Mandatory prewash in accordance with the ship's Procedures and Arrangements Manual

12 Identify tank(s), substance(s) and Category(ies).

13 Washing method:

.1 number of washing machines per tank;

.2 duration of wash/washing cycles;

.3 hot/cold wash.

14 Prewash slops transferred to:

.1 reception facility in unloading port (identify port)*;

.2 reception facility otherwise (identify port)*.

(E) Cleaning of cargo tanks except mandatory prewash (other prewash operations, final wash, ventilation etc.)

15 State time, identify tank(s), substance(s) and Category(ies) and state:

.1 washing procedure used;

.2 cleaning agent(s) (identify agent(s) and quantities);

.3 ventilation procedure used (state number of fans used, duration of ventilation).

16 Tank washings transferred:

.1 into the sea;

.2 to reception facility (identify port)*;

.3 to slops collecting tank (identify tank).

(F) Discharge into the sea of tank washings

17 Identify tank(s):

.1 Were tank washings discharged during cleaning of tank(s)? If so at what rate?

* Ship's masters should obtain from the operator of the reception facilities, which include barges and tank trucks, a receipt or certificate specifying the quantity of tank washings transferred, together with the time and date of the transfer. The receipt or certificate should be kept together with the cargo record book.

.2 Were tank washing(s) discharged from a slops collecting tank? If so, state quantity and rate of discharge.

18 Time pumping commenced and stopped.

19 Ship's speed during discharge.

(G) Ballasting of cargo tanks

20 Identity of tank(s) ballasted.

21 Time at start of ballasting.

(H) Discharge of ballast water from cargo tanks

22 Identity of tank(s).

23 Discharge of ballast:

.1 into the sea;

.2 to reception facilities (identify port) *.

24 Time ballast discharge commenced and stopped.

25 Ship's speed during discharge.

(I) Accidental or other exceptional discharge

26 Time of occurrence.

27 Approximate quantity, substance(s) and Category(ies).

28 Circumstances of discharge or escape and general remarks.

(J) Control by authorized surveyors

29 Identify port.

30 Identify tank(s), substance(s), Category(ies) discharged ashore.

31 Have tank(s), pump(s), and piping system(s) been emptied?

32 Has a prewash in accordance with the ship's Procedures and Arrangements Manual been carried out?

33 Have tank washings resulting from the prewash been discharged ashore and is the tank empty?

* Ship's masters should obtain from the operator of the reception facilities, which include barges and tank trucks, a receipt or certificate specifying the quantity of tank washings transferred, together with the time and date of the transfer. The receipt or certificate should be kept together with the cargo record book.

- 34 An exemption has been granted from mandatory prewash.
- 35 Reasons for exemption.
- 36 Name and signature of authorized surveyor.
- 37 Organization, company, government agency for which surveyor works.

(K) Additional operational procedures and remarks

APPENDIX III

FORM OF INTERNATIONAL POLLUTION PREVENTION CERTIFICATE FOR THE CARRIAGE OF NOXIOUS LIQUID SUBSTANCES IN BULK

INTERNATIONAL POLLUTION PREVENTION CERTIFICATE FOR THE CARRIAGE OF NOXIOUS LIQUID SUBSTANCES IN BULK

Issued under the provisions of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended (hereinafter referred to as "the Convention") under the authority of the Government of:

.....
(full designation of the country)

by.....
(full designation of the competent person or organization authorized under the provisions of the Convention)

Particulars of ship¹

Name of ship

Distinctive number or letters.....

IMO Number.....

Port of registry.....

Gross tonnage.....

¹ Alternatively, the particulars of the ship may be placed horizontally in boxes.

THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with regulation 8 of Annex II of the Convention.
- 2 That the survey showed that the structure, equipment, systems, fitting, arrangements and material of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the applicable requirements of Annex II of the Convention.
- 3 That the ship has been provided with a Procedures and Arrangements Manual required by regulation 14 of Annex II of the Convention, and that the arrangements and equipment of the ship prescribed in the Manual are in all respects satisfactory and comply with the applicable requirements of the said Standards.
- 4 That the ship is suitable for the carriage in bulk of the following Noxious Liquid Substances, provided that all relevant operational provisions of Annex II of the Convention are observed.

Noxious Liquid Substances	Conditions of carriage (tank numbers etc.)
Continued on additional signed and dated sheets	

This certificate is valid until subject to surveys in accordance with regulation 8 of Annex II of the Convention.

Completion date of the survey on which this certificate is based (dd/mm/yy):

Issued at.....
(Place of issue of certificate)

.....
(Date of issue)

.....
(Signature of authorized official issuing the certificate)

(Seal or stamp of the authority, as appropriate)

ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS

THIS IS TO CERTIFY that, at a survey required by regulation 8 of Annex II of the Convention, the ship was found to comply with the relevant provisions of the Convention:

Annual survey: Signed.....
(Signature of authorized official)
Place.....
Date.....

(Seal or stamp of the authority, as appropriate)

Annual/Intermediate survey: Signed.....
(Signature of authorized official)
Place.....
Date.....

(Seal or stamp of the authority, as appropriate)

Annual/Intermediate survey: Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

Annual survey: Signed.....
(Signature of authorized official)
Place.....
Date.....

(Seal or stamp of the authority, as appropriate)

ANNUAL/INTERMEDIATE SURVEY IN ACCORDANCE WITH REGULATION 10.8.3

THIS IS TO CERTIFY that, at an annual/intermediate survey in accordance with regulation 10.8.3 of Annex II of the Convention, the ship was found to comply with the relevant provisions of the Convention:

Signed.....
(Signature of authorized official)
Place.....
Date.....

(Seal or stamp of the authority, as appropriate)

**ENDORSEMENT TO EXTEND THE CERTIFICATE IF VALID
FOR LESS THAN 5 YEARS WHERE REGULATION 10.3 APPLIES**

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with regulation 10.3 of Annex II of the Convention, be accepted as valid until

Signed.....
(Signature of authorized official)
Place.....
Date.....

(Seal or stamp of the authority, as appropriate)

**ENDORSEMENT WHERE THE RENEWAL SURVEY HAS BEEN
COMPLETED AND REGULATION 10.4 APPLIES**

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with regulation 10.4 of Annex II of the Convention, be accepted as valid until

Signed.....
(Signature of authorized official)
Place.....
Date.....

(Seal or stamp of the authority, as appropriate)

ENDORSEMENT TO EXTEND THE VALIDITY OF THE CERTIFICATE UNTIL REACHING THE PORT OF SURVEY OR FOR A PERIOD OF GRACE WHERE REGULATION 10.5 OR 10.6 APPLIES

This Certificate shall, in accordance with regulation 10.5 or 10.6 of Annex II of the Convention, be accepted as valid until

Signed.....
(Signature of authorized official)
Place.....
Date.....

(Seal or stamp of the authority, as appropriate)

ENDORSEMENT FOR ADVANCEMENT OF ANNIVERSARY DATE WHERE REGULATION 10.8 APPLIES

In accordance with regulation 10.8 of Annex II of the Convention, the new anniversary date is

Signed.....
(Signature of authorized official)
Place.....
Date.....

(Seal or stamp of the authority, as appropriate)

In accordance with regulation 10.8 of Annex II of the Convention, the new anniversary date is

Signed.....
(Signature of authorized official)
Place.....
Date.....

(Seal or stamp of the authority, as appropriate)

APPENDIX IV**STANDARD FORMAT FOR THE PROCEDURES AND ARRANGEMENT MANUAL**

Note 1: The format consists of a standardized introduction and index of the leading paragraphs to each section. This standardized part should be reproduced in the Manual of each ship. It shall be followed by the contents of each section as prepared for the particular ship. When a section is not applicable, "NA" should be entered. The contents will vary from ship to ship because of design, trade and intended cargoes.

Note 2: If the Administration requires or accepts information and operational instructions in addition to those outlined in this Standard Format, they should be included in Appendix D of the Manual.

STANDARD FORMAT

MARPOL 73/78 ANNEX II PROCEDURES AND ARRANGEMENTS MANUAL

Name of ship:

Distinctive number or letters:

IMO Number.....

Port of registry:

Approval stamp of Administration:

INTRODUCTION

1 The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (hereinafter referred to as MARPOL 73/78) was established in order to prevent the pollution of the marine environment by discharges into the sea from ships of harmful substances or effluents containing such substances. In order to achieve its aim, MARPOL 73/78 contains six Annexes in which detailed regulations are given with respect to the handling on board ships and the discharge into the sea or release into the atmosphere of six main groups of harmful substances, i.e. Annex I (Mineral oils), Annex II (Noxious Liquid Substances carried in bulk), Annex III (Harmful substances carried in packaged forms), Annex IV (Sewage), Annex V (Garbage) and Annex VI (Air Pollution).

2 Regulation 13 of Annex II of MARPOL 73/78 (hereinafter referred to as Annex II) prohibits the discharge into the sea of Noxious Liquid Substances of Categories X, Y or Z or of ballast water, tank washings or other residues or mixtures containing such substances, except in compliance with specified conditions including procedures and arrangements based upon standards developed by the International Maritime Organization (IMO) to ensure that the criteria specified for each Category will be met.

3 Annex II requires that each ship which is certified for the carriage of Noxious Liquid Substances in bulk shall be provided with a Procedures and Arrangements Manual, hereinafter referred to as the Manual.

4 This Manual has been written in accordance with Appendix IV of Annex II and is concerned with the marine environmental aspects of the cleaning of cargo tanks and the discharge of residues and mixtures from these operations. The Manual is not a safety guide and reference should be made to other publications specifically to evaluate safety hazards.

5 The purpose of the Manual is to identify the arrangements and equipment required to enable compliance with Annex II and to identify for the ship's officers all operational procedures with respect to cargo handling, tank cleaning, slops handling, residue discharging, ballasting and deballasting, which must be followed in order to comply with the requirements of Annex II.

6 In addition, this Manual, together with the ship's Cargo Record Book and [International Certificate for the Carriage of Noxious Liquid Substances in Bulk/Certificate of Fitness issued under the International Bulk Chemical Code/Certificate of Fitness issued under the Bulk Chemical Code]*, will be used by Administrations for control purposes in order to ensure full compliance with the requirements of Annex II by this ship.

7 The master shall ensure that no discharges into the sea of cargo residues or residue/water mixtures containing Category X, Y or Z substances shall take place, unless such discharges are made in full compliance with the operational procedures contained in this Manual.

8 This Manual has been approved by the Administration and no alteration or revision shall be made to any part of it without the prior approval of the Administration.

* Include only the Certificates issued to the particular ship.
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INDEX OF SECTIONS

- 1 Main features of MARPOL 73/78, Annex II
 - 2 Description of the ship's equipment and arrangements
 - 3 Cargo unloading procedures and tank stripping
 - 4 Procedures relating to the cleaning of cargo tanks, the discharge of residues, ballasting and deballasting
-
- | | | |
|------------|---|--|
| Table 1 | : | List of Noxious Liquid Substances allowed to be carried |
| Table 2 | : | Cargo tank information |
| Addendum A | : | Flow diagrams |
| Addendum B | : | Prewash procedures |
| Addendum C | : | Ventilation procedures |
| Addendum D | : | Additional information and operational instructions when required or accepted by the Administration. |

SECTION 1 Main features of MARPOL 73/78, Annex II

1.1 The requirements of Annex II apply to all ships carrying Noxious Liquid Substances in bulk. Substances posing a threat of harm to the marine environment are divided into three categories, X, Y and Z. Category X substances are those posing the greatest threat to the marine environment, whilst Category Z substances are those posing the smallest threat.

1.2 Annex II prohibits the discharge into the sea of any effluent containing substances falling under these categories, except when the discharge is made under conditions which are specified in detail for each Category. These conditions include, where applicable, such parameters as:

- .1 the maximum quantity of substances per tank which may be discharged into the sea;
- .2 the speed of the ship during the discharge;
- .3 the minimum distance from the nearest land during discharge;
- .4 the minimum depth of water at sea during discharge; and
- .5 the need to effect the discharge below the waterline.

1.3 For certain sea areas identified as “special area” more stringent discharge criteria apply. Under Annex II the special area is the Antarctic area.

1.4 Annex II requires that every ship is provided with pumping and piping arrangements to ensure that each tank designated for the carriage of Category X, Y and Z substances does not retain after unloading a quantity of residue in excess of the quantity given in the Annex. For each tank intended for the carriage of such substances an assessment of the residue quantity has to be made. Only when the residue quantity as assessed is less than the quantity prescribed by the Annex a tank may be approved for the carriage of a Category X, Y or Z substances.

1.5 In addition to the conditions referred to above, an important requirement contained in Annex II is that the discharge operations of certain cargo residues and certain tank cleaning and ventilation operations may only be carried out in accordance with approved procedures and arrangements.

1.6 To enable this requirement to be complied with, this Manual contains in section 2 all particulars of the ship's equipment and arrangements, in section 3 operational procedures for cargo unloading and tank stripping and in section 4 procedures for discharge of cargo residues, tank washing, slops collection, ballasting and deballasting as may be applicable to the substances the ship is certified to carry.

1.7 By following the procedures as set out in this Manual, it will be ensured that the ship complies with all relevant requirements of Annex II to MARPOL 73/78.

SECTION 2 Description of the ship's equipment and arrangements

2.1 This section contains all particulars of the ship's equipment and arrangements necessary to enable the crew to follow the operational procedures set out in sections 3 and 4.

2.2 *General arrangement of ship and description of cargo tanks*

This section should contain a brief description of the cargo area of the ship with the main features of the cargo tanks and their positions.

Line or schematic drawings showing the general arrangement of the ship and indicating the position and numbering of the cargo tanks and heating arrangements should be included. Identification of the cargo tanks certified fit to carry Noxious Liquid Substances should be made in conjunction with table 1 of this Manual.

2.3 *Description of cargo pumping and piping arrangements and stripping system*

This section should contain a description of the cargo pumping and piping arrangements and of the stripping system. Line or schematic drawings should be provided showing the following and be supported by textual explanation where necessary:

- .1 cargo piping arrangements with diameters;
- .2 cargo pumping arrangements with pump capacities;
- .3 piping arrangements of stripping system with diameters;
- .4 pumping arrangements of stripping system with pump capacities;
- .5 location of suction points of cargo lines and stripping lines inside every cargo tank;
- .6 if a suction well is fitted, the location and cubic capacity thereof;
- .7 line draining and stripping or blowing arrangements; and
- .8 quantity and pressure of nitrogen or air required for line blowing if applicable.

2.4 *Description of ballast tanks and ballast pumping and piping arrangements*

This section should contain a description of the ballast tanks and ballast pumping and piping arrangements.

Line or schematic drawings and tables should be provided showing the following:

- .1 a general arrangement showing the segregated ballast tanks and cargo tanks to be used as ballast tanks together with their capacities (cubic metres);
- .2 ballast piping arrangement;

- .3 pumping capacity for those cargo tanks which may also be used as ballast tanks; and
- .4 any interconnection between the ballast piping arrangements and the underwater outlet system.

2.5 ***Description of dedicated slop tanks with associated pumping and piping arrangements***

This section should contain a description of the dedicated slop tank(s), if any, with the associated pumping and piping arrangements. Line or schematic drawings should be provided showing the following:

- .1 which dedicated slop tanks are provided together with the capacities of such tanks;
- .2 pumping and piping arrangements of dedicated slop tanks with piping diameters and their connection with the underwater discharge outlet.

2.6 ***Description of underwater discharge outlet for effluents containing Noxious Liquid Substances***

This section should contain information on position and maximum flow capacity of the underwater discharge outlet (or outlets) and the connections to this outlet from the cargo tanks and slop tanks. Line or schematic drawings should be provided showing the following:

- .1 location and number of underwater discharge outlets;
- .2 connections to underwater discharge outlet;
- .3 location of all seawater intakes in relation to underwater discharge outlets.

2.7 ***Description of flow rate indicating and recording devices***

Deleted

2.8 ***Description of cargo tank ventilation system***

This section should contain a description of the cargo tank ventilation system.

Line or schematic drawings and tables should be provided showing the following and supported by textual explanation if necessary:

- .1 the Noxious Liquid Substances the ship is certified fit to carry having a vapour pressure over 5 kPa at 20°C suitable for cleaning by ventilation to be listed in table 1;
- .2 ventilation piping and fans;
- .3 position of the ventilation openings;

- .4 the minimum flow rate of the ventilation system to adequately ventilate the bottom and all parts of the cargo tank;
- .5 the location of structures inside the tank affecting ventilation;
- .6 the method of ventilating the cargo pipeline system, pumps, filters, etc; and
- .7 means for ensuring that the tank is dry.

2.9 ***Description of tank washing arrangements and wash water heating system***

This section should contain a description of the cargo tank washing arrangements, wash water heating system and all necessary tank washing equipment.

Line or schematic drawings and tables or charts showing the following:

- .1 arrangements of piping dedicated for tank washing with pipeline diameters;
- .2 type of tank washing machines with capacities and pressure rating;
- .3 maximum number of tank washing machines which can operate simultaneously;
- .4 position of deck openings for cargo tank washing;
- .5 the number of washing machines and their location required for ensuring complete coverage of the cargo tank walls;
- .6 maximum capacity of wash water which can be heated to 60°C by the installed heating equipment; and
- .7 maximum number of tank washing machines which can be operated simultaneously at 60°C.

SECTION 3 Cargo unloading procedures and tank stripping

3.1 This section contains operational procedures in respect of cargo unloading and tank stripping which must be followed in order to ensure compliance with the requirements of Annex II.

3.2 *Cargo unloading*

This section should contain procedures to be followed including the pump and cargo unloading and suction line to be used for each tank. Alternative methods may be given.

The method of operation of the pump or pumps and the sequence of operation of all valves should be given.

The basic requirement is to unload the cargo to the maximum practicable extent.

3.3 *Cargo tank stripping*

This section should contain procedures to be followed during the stripping of each cargo tank.

The procedures should include the following:

- .1 operation of stripping system;
- .2 list and trim requirements;
- .3 line draining and stripping or blowing arrangements if applicable.

3.4 *Cargo temperature*

This section should contain information on the heating requirements of cargoes which have been identified as being required to be at a certain minimum temperature during unloading.

Information should be given on control of the heating system and the method of temperature measurement.

3.5 *Procedures to be followed when a cargo tank cannot be unloaded in accordance with the required procedures*

This section should contain information on the procedures to be followed in the event that the requirements contained in sections 3.3 and/or 3.4 cannot be met due to circumstances such as the following:

- .1 failure of cargo tank stripping system; and
- .2 failure of cargo tank heating system.

3.6 *Cargo Record Book*

The Cargo Record Book should be completed in the appropriate places on completion of cargo unloading.

SECTION 4 *Procedures relating to the cleaning of cargo tanks, the discharge of residues, ballasting and deballasting*

4.1 This section contains operational procedures in respect of tank cleaning, ballast and slops handling which must be followed in order to ensure compliance with the requirements of Annex II.

4.2 The following paragraphs outline the sequence of actions to be taken and contain the information essential to ensure that Noxious Liquid Substances are discharged without posing a threat of harm to the marine environment.

4.3 *Deleted*

4.4 The information necessary to establish the procedures for discharging the residue of the cargo, cleaning, ballasting and deballasting the tank, should take into account the following:

.1 Category of substance

Obtain the Category of the substance from table 1.

.2 Stripping efficiency of tank pumping system

The contents of this section will depend on the design of the ship and whether it is a new ship or existing ship (See flow diagrams and pumping/stripping requirements).

.3 Vessel within or outside special area

This section should contain instructions on whether the tank washings can be discharged into the sea within a special area (as defined in section 1.3) or outside a special area. The different requirements should be made clear and will depend on the design and trade of the ship.

.4 Solidifying or high-viscosity substance

The properties of the substance should be obtained from the shipping document.

.5 Miscibility with water Deleted

.6 Compatibility with slops containing other substances

This section should contain instructions on the permissible and non-permissible mixing of cargo slops. Reference should be made to compatibility guides.

.7 Discharge to reception facility

This section should identify those substances the residues of which are required to be prewashed and discharged to a reception facility.

.8 Discharging into the sea

This section should contain information on the factors to be considered in order to identify whether the residue/water mixtures are permitted to be discharged into the sea.

.9 Use of cleaning agents or additives*

This section should contain information on the use and disposal of cleaning agents (e.g. solvents used for tank cleaning) and additives to tank washing water (e.g. detergents)

.10 Use of ventilation procedures for tank cleaning

This section should make reference to table 1 to ascertain the suitability of the use of ventilation procedures.

* See the latest edition of MEPC.2/Circular, Annex 12 (issued annually in December)
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4.5 Having assessed the above information, the correct operational procedures to be followed should be identified using the instructions and flow diagrams in this section. Appropriate entries should be made in the Cargo Record Book indicating the procedure adopted.

INFORMATION AND PROCEDURES

This section should contain procedures, which will depend on the age of the ship and pumping efficiency. Examples of flow diagrams referred to in this section are given at addendum A and incorporate comprehensive requirements applicable to both new and existing ships. The Manual for a particular ship should only contain those requirements specifically applicable to that ship. The Manual should contain the following information and procedures:

- Table 1 : List of Noxious Liquid Substances allowed to be carried.
- Table 2 : Cargo tank information.
- Addendum A : Flow diagrams.
- Addendum B : Prewash procedures.
- Addendum C : Ventilation procedures.
- Addendum D : Additional information and operational instructions when required or accepted by the Administration.

Outlines of the above tables and addenda follow.

Table 1 - List of Noxious Liquid Substances allowed to be carried

Substance	Category	Tanks (tank groups)* fit for carriage	Melting point °C	Viscosity at 20°C mPa.s		Suitable for ventilation Yes/No
				<50	≥50	

Note: Information need only be inserted in the fourth and fifth columns, relating to melting point and viscosity, for those substances which have a melting point greater than 0C or a viscosity greater than 50 mPa.s at 20°C. When more than one commercial grade is shipped and the viscosities or the melting points of those commercial grades differ, enter and note that other commercial grades may have lower viscosities or melting points or give the values for each commercial grade which will be shipped.

* Tank numbers (tank groups) should be identical to those in the ship's Certificate of Fitness.

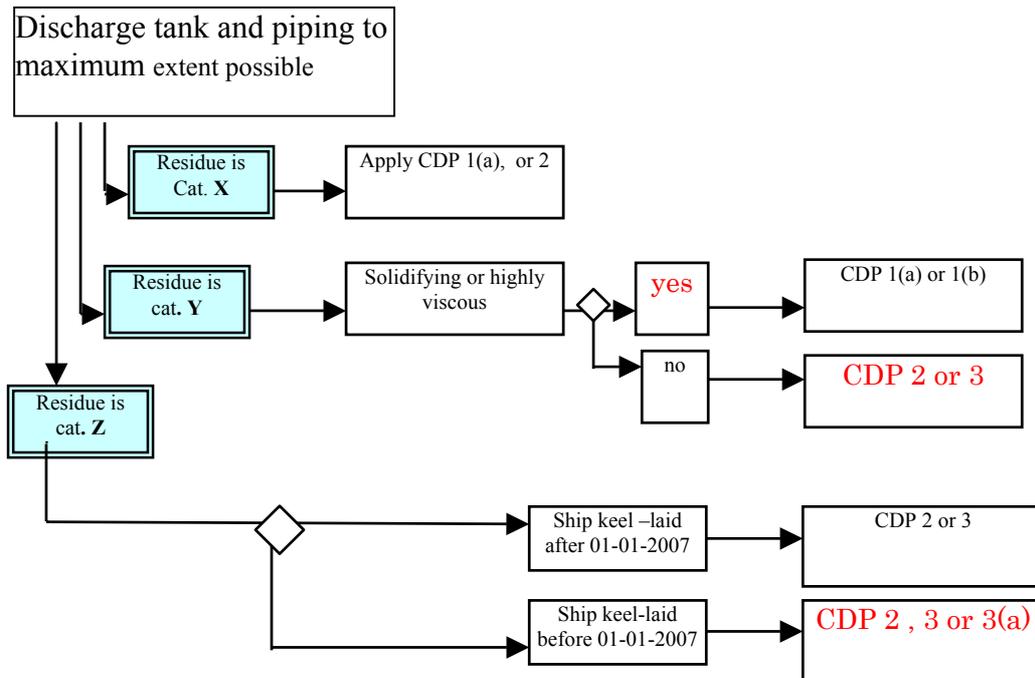
Table 2 - Cargo tank information

Tank no.	Capacity (m ³)	Stripping quantity litres	Approved stripping level under reg. 12

ADDENDUM A Flow diagrams -- Cleaning of cargo tanks and disposal of tank washings/ballast containing residues of Category X,Y, and D substances

Note 1 : This flow diagram gives comprehensive requirements applicable to all age groups of ships

Note 2 : Discharge into the sea is always regulated by Annex II



Note 1: Within the Antarctic area any discharge into the sea of noxious liquid substances or mixtures containing such substances is prohibited.

Note 2: This is a flow diagram giving comprehensive requirements applicable to new and existing ships. The flow diagram for a specific ship should only include parts applicable to that ship.

Stripping requirements (in litres)	Category X	Category Y	Category Z
Ship keel-laid after 01-01-2007	75	75	75
Ship keel-laid before 01-01-2007	100 + 50 tolerance	100 + 50 tolerance	300 + 50 tolerance
<i>BCH ships</i>	300 + 50 tolerance	300 + 50 tolerance	900 + 50 tolerance
<i>Non-chemical tankers, keel-laid before 01-01-2007</i>	N/a	N/a	No quantity requirement

Cleaning and disposal procedures (CDP)		Sequence Number				
		1(a)	1(b)	2	3	3(a)
1	Strip tank and piping to maximum extent, at least in compliance with the procedures in section 3 of this Manual	X	X	X	X	X
2	Apply prewash in accordance with Addendum B and discharge residue to reception facility	X	X			
3	Apply subsequent wash, additional to the prewash, with: a complete cycle of the washing machine(s) <i>for ships built before 1 July 1994</i> a water quantity not less than calculated with "k"=[1.0] <i>for ships built on or after 1 July 1994</i>		X			
4	Apply ventilation procedure in accordance with Addendum C			X		
5	Ballast tanks or wash tank to commercial standards	X		X	X	X
6	Ballast added to tank		X			
7	Conditions for discharge of ballast/residue/water mixtures other than prewash :					
	.1 <i>distance from land > 12 nautical miles</i>	X			X	X
	.2 <i>ship's speed > 7 knots</i>	X			X	X
	.3 <i>water depth > 25 metres</i>	X			X	X
	.4 <i>Using underwater discharge (not exceeding permissible discharge rate)</i>	X			X	
8	Conditions for discharge of ballast:					
	.1 <i>distance from land > 12 nautical miles</i>		X			
	.2 <i>water depth > 25 metres</i>		X			
9	Any water subsequently introduced into a tank may be discharged into the sea without restrictions	X	X	X	X	X

Note 1: Start at the top of the column under the CDP number specified and complete each item procedure in the sequence where marked by "X"

Note 2: Residue water mixtures may be discharged ashore optionally, which is not a MARPOL requirement

ADDENDUM B Prewash procedures

This addendum to the Manual should contain prewash procedures based on appendix VI of Annex II. These procedures should contain specific requirements for the use of the tank washing arrangements and equipment provided on the particular ship and include the following:

- .1 washing machine positions to be used;
- .2 slops pumping out procedure;
- .3 requirements for hot washing;
- .4 number of cycles of washing machine (or time); and
- .5 minimum operating pressures.

ADDENDUM C Ventilation procedures

This addendum to the Manual should contain ventilation procedures based on appendix VII of Annex II. The procedures should contain specific requirements for the use of the cargo tank ventilation system, or equipment, fitted on the particular ship and should include the following:

- .1 ventilation positions to be used;
- .2 minimum flow or speed of fans;
- .3 procedures for ventilating cargo pipeline, pumps, filters, etc.;
- .4 procedures for ensuring that tanks are dry on completion.

ADDENDUM D Additional information and operation instructions required or accepted by the Administration

APPEXDIX V

ASSESSMENT OF RESIDUE QUANTITIES IN CARGO TANKS, PUMPS AND ASSOCIATED PIPING

1 Introduction

1.1 Purpose

1.1.1 The purpose of this appendix is to provide the procedure for testing the efficiency of cargo pumping systems.

1.2 Background

1.2.1 The ability of the pumping system of a tank to comply with regulation 12.1, 12.2 or 12.3 is determined by performing a test in accordance with the procedure set out in section 3 of this appendix. The quantity measured is termed the "stripping quantity". The stripping quantity of each tank shall be recorded in the ship's Manual.

1.2.2 After having determined the stripping quantity of one tank, the Administration may use the determined quantities for a similar tank, provided the Administration is satisfied that the pumping system in that tank is similar and operating properly.

2 Design criteria and performance test

2.1 The cargo pumping systems should be designed to meet the required maximum amount of residue per tank and associated piping as specified in regulation 12 of Annex II to the satisfaction of the Administration.

2.2 In accordance with regulation 12.5 the cargo pumping systems should be tested with water to prove their performance. Such water tests should, by measurement, show that the system meets the requirements of regulation 12. In respect of regulations 12.1 and 12.2 a tolerance of 50 litres per tank is acceptable.

3 Water test procedure

3.1 Test condition

3.1.1 The ship's trim and list should be such as to provide favourable drainage to the suction point. During the water test the ship's trim should not exceed 3° by the stern, and the ship's list should not exceed 1°.

3.1.2 The trim and list chosen for the water test should be the minimum favourable trim and list as given in the ship's Manual for the stripping of the cargo tanks.

3.1.3 During the water test means should be provided to maintain a back-pressure of not less than 100kPa at the cargo tank's unloading manifold (see figures A-1 and A-2).

3.2 Test procedure

3.2.1 Ensure that the cargo tank to be tested and its associated piping have been cleaned and that the cargo tank is safe for entry.

3.2.2 Fill the cargo tank with water to a depth necessary to carry out normal end of unloading procedures.

3.2.3 Pump and strip the cargo tank and its associated piping in accordance with the ship's approved Manual.

3.2.4 Collect all water remaining in the cargo tank and its associated piping into a calibrated container for measurement. Water residues should be collected, *inter alia*, from the following points:

- .1 the cargo tank suction and its vicinity;
- .2 any entrapped areas on the cargo tank bottom;
- .3 the low point drain of the cargo pump; and
- .4 all low point drains of piping associated with the cargo tank up to the manifold valve.

3.2.5 The total water volumes collected above determine the stripping quantity for the cargo tank.

3.2.6 Where a group of tanks is served by a common pump or piping, the water test residues associated with the common system(s) may be apportioned equally among the tanks provided that the following operational restriction is included in the ship's approved Manual: "For sequential unloading of tanks in this group, the pump or piping is not to be washed until all tanks in the group have been unloaded."

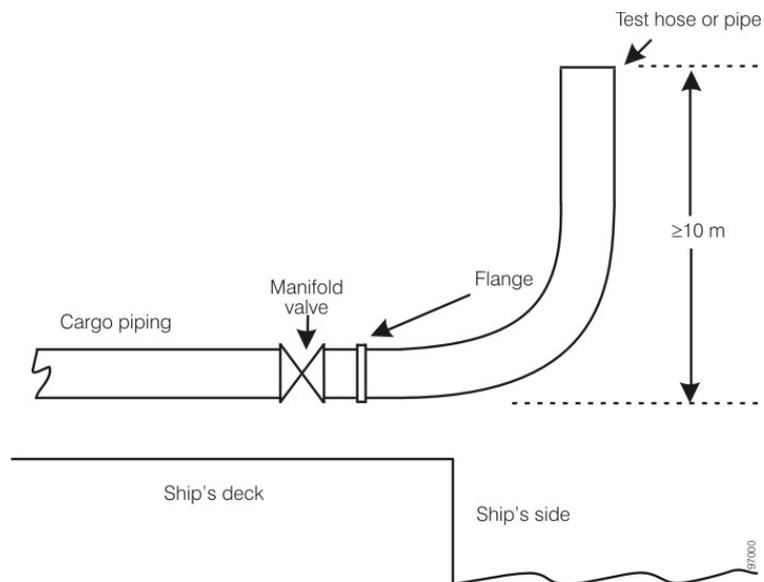


Figure A-1

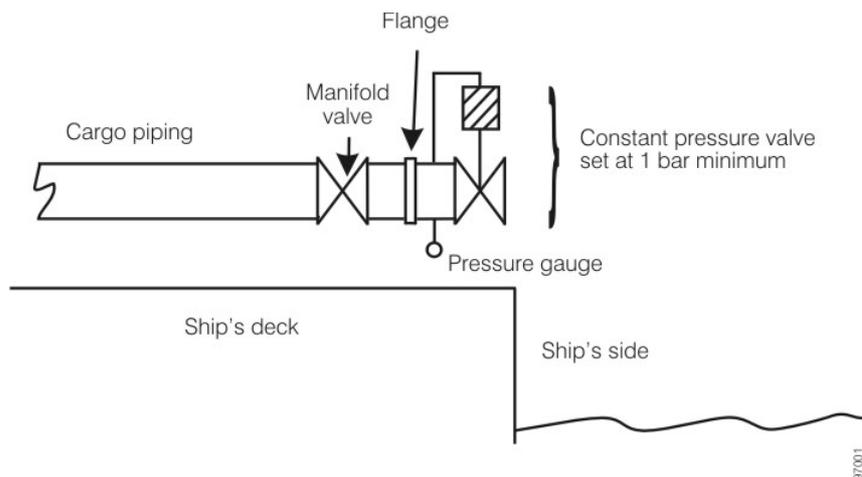


Figure A-2

The above figures illustrate test arrangements that would provide a backpressure of not less than 100 kPa at the cargo tank's unloading manifold.

The above figures illustrate test arrangements that would provide a backpressure of not less than 100 kPa at the cargo tank's unloading manifold.

4 Calculation of clingage residues

4.1 Calculate the clingage residues using the following formula:

$$Q_{\text{RES}}^{(\text{surf})} = 1.1 \times 10^{-4} A_d + 1.5 \times 10^{-5} A_w + 4.5 \times 10^{-4} L^{1/2} A_b$$

4.2 Symbols and units used in the residue equation:

A_b = Area of tank bottom and horizontal components of tank structural members facing upwards (m^2)

A_d = Area underdecks and horizontal components of tank structural members facing downwards (m^2)

A_w = Surface area of tank walls and vertical components of tank structural members (m^2)

L = Length of tank (m)

$Q_{\text{RES}}^{(\text{surf})}$ = Amount of clingage residue on tank surfaces (m^3)

Note 1: For purposes of calculating A_b , A_d and A_w , inclined (greater than 30° from the horizontal) and curved surfaces should be treated as vertical.

Note 2: Methods of approximating A_b , A_d and A_w are permissible. A method presented in BCH 15/INF.5 by Japan is an example.

APPENDIX VI

PREWASH PROCEDURES

A For ships built before 1 July 1994

A prewash procedure is required in order to meet certain Annex II requirements. This appendix explains how these prewash procedures should be performed.

Prewash procedures for non-solidifying substances

1 Tanks should be washed by means of a rotary water jet, operated at sufficiently high water pressure. In the case of Category X substances washing machines should be operated in such locations that all tank surfaces are washed. In the case of Category Y and Z substances only one location need be used.

2 During washing the amount of water in the tank should be minimized by continuously pumping out slops and promoting flow to the suction point (positive list and trim). If this condition cannot be met the washing procedure should be repeated three times, with thorough stripping of the tank between washings.

3 Those substances which have a viscosity equal to or greater than 50 mPa.s at 20°C should be washed with hot water (temperature at least 60°C), unless the properties of such substances make the washing less effective.

4 The number of cycles of the washing machine used should not be less than that specified in table B-1. A washing machine cycle is defined as the period between two consecutive identical orientations of the washing machine (rotation through 360°).

5 After washing, the washing machine(s) should be kept operating long enough to flush the pipeline, pump and filter, unless the properties of such substances make the washing less effective.

Prewash procedures for solidifying substances

1 Tanks should be washed as soon as possible after unloading. If possible tanks should be heated prior to washing.

2 Residues in hatches and manholes should preferably be removed prior to the prewash.

3 Tanks should be washed by means of a rotary water jet operated at sufficiently high water pressure and in locations to ensure that all tank surfaces are washed.

4 During washing the amount of water in the tank should be minimized by pumping out slops continuously and promoting flow to the suction point (positive list and trim). If this condition cannot be met, the washing procedure should be repeated three times with thorough stripping of the tank between washings.

5 Tanks should be washed with hot water (temperature at least 60°C) unless the properties of such substances make the washing less effective.

6 The number of cycles of the washing machine used should not be less than that specified in table B-1. A washing machine cycle is defined as the period between two consecutive identical orientations of the machine (rotation through 360°).

7 After washing, the washing machine(s) should be kept operating long enough to flush the pipeline, pump and filter.

Table B-1 -- Number of washing machine cycles to be used in each location

Category of substance	Number of washing machine cycles	
	Non-solidifying substances	Solidifying substances
Category X (residual concentration 0.1%)	1	2
Category Y	1/2	1

Note: For an explanation of “residual concentration” see regulation 13.7.1 of Annex II.

B For ships built on or after 1 July 1994 and recommendatory for ships built before 1 July 1994

A prewash procedure is required in order to meet certain Annex II requirements. This appendix explains how these prewash procedures should be performed and how the minimum volumes of washing media to be used should be determined. Smaller volumes of washing media may be used based on actual verification testing to the satisfaction of the Administration. Where reduced volumes are approved an entry to that effect must be recorded in the Manual.

If a medium other than water is used for the prewash, the provisions regulation 13.5.1 apply.

Prewash procedures for non-solidifying substances without recycling

1 Tanks should be washed by means of a rotary jet(s), operated at sufficiently high water pressure. In the case of Category X substances washing machines should be operated in such locations that all tank surfaces are washed. In the case of Category Y substances only one location need be used.

2 During washing the amount of liquid in the tank should be minimized by continuously pumping out slops and promoting flow to the suction point. If this condition cannot be met, the washing procedure should be repeated three times, with thorough stripping of the tank between washings.

3 Those substances which have a viscosity equal to or greater than 50 mPa.s at 20°C should be washed with hot water (temperature at least 60°C), unless the properties of such substances make the washing less effective.

4 The quantities of wash water used should not be less than those specified in paragraph 20 or determined according to paragraph 21.

5 After prewashing the tanks and lines should be thoroughly stripped.

Prewash procedures for solidifying substances without recycling.

6 Tanks should be washed as soon as possible after unloading. If possible, tanks should be heated prior to washing.

7 Residues in hatches and manholes should preferably be removed prior to the prewash.

8 Tanks should be washed by means of a rotary jet(s) operated at sufficiently high water pressure and in locations to ensure that all tank surfaces are washed.

9 During washing the amount of liquid in the tank should be minimized by pumping out slops continuously and promoting flow to the suction point. If this condition cannot be met, the washing procedure should be repeated three times with thorough stripping of the tank between washings.

10 Tanks should be washed with hot water (temperature at least 60°C), unless the properties of such substances make the washing less effective.

11 The quantities of wash water used should not be less than those specified in paragraph 20 or determined according to paragraph 21.

12 After prewashing the tanks and lines should be thoroughly stripped.

Prewash procedures with recycling of washing medium

13 Washing with a recycled washing medium may be adopted for the purpose of washing more than one cargo tank. In determining the quantity, due regard must be given to the expected amount of residues in the tanks and the properties of the washing medium and whether any initial rinse or flushing is employed. Unless sufficient data are provided, the calculated end concentration of cargo residues in the washing medium should not exceed 5% based on nominal stripping quantities.

14 The recycled washing medium should only be used for washing tanks having contained the same or similar substance.

15 A quantity of washing medium sufficient to allow continuous washing should be added to the tank or tanks to be washed.

16 All tank surfaces should be washed by means of a rotary jet(s) operated at sufficiently high pressure. The recycling of the washing medium may either be within the tank to be washed or via another tank, e.g. a slop tank.

17 The washing should be continued until the accumulated throughput is not less than that corresponding to the relevant quantities given in paragraph 20 or determined according to paragraph 21.

18 Solidifying substances and substances with viscosity equal to or greater than 50 mPa.s at 20°C should be washed with hot water (temperature at least 60°C) when water is used as the washing medium, unless the properties of such substances make the washing less effective.

19 After completing the tank washing with recycling to the extent specified in paragraph 17, the washing medium should be discharged and the tank thoroughly stripped. Thereafter, the tank should be subjected to a rinse, using clean washing medium, with continuous drainage and discharge. The rinse should as a minimum cover the tank bottom and be sufficient to flush the pipelines, pump and filter.

Minimum quantity of water to be used in a prewash

20 The minimum quantity of water to be used in a prewash is determined by the residual quantity of noxious liquid substance in the tank, the tank size, the cargo properties, the permitted concentration in any subsequent wash water effluent, and the area of operation. The minimum quantity is given by the following formula:

$$Q=k(15r^{0.8} + 5r^{0.7} \times V/1000)$$

where

Q = the required minimum quantity in m³

r = the residual quantity per tank in m³. The value of r shall be the value demonstrated in the actual stripping efficiency test, but should not be taken lower than 0.100 m³ for a tank volume of 500 m³ and above and 0.040 m³ for a tank volume of 100 m³ and below. For tank sizes between 100 m³ and 500 m³ the minimum value of r allowed to be used in the calculations is obtained by linear interpolation.

For Category X substances the value of r should either be determined based on stripping tests according to the Manual, observing the lower limits as given above, or be taken to be 0.9 m³.

V = tank volume in m³

k = a factor having values as follows:

Category X, non-solidifying, low-viscosity substance, k = 1.2

Category X, solidifying or high-viscosity substance, k = 2.4

Category Y, non-solidifying, low-viscosity substance k = 0.5

Category Y, solidifying or high-viscosity substance k = 1.0

The table below is calculated using the formula with a k factor of 1 and may be used as an easy reference.

Stripping quantity (m ³)	Tank volume (m ³)		
	100	500	3000
≤0.04	1.2	2.9	5.4
.10	2.5	2.9	5.4
.30	5.9	6.8	12.2
.90	14.3	16.1	27.7

21 Verification testing for approval of prewash volumes lower than those given in paragraph 20 may be carried out to the satisfaction of the Administration to prove that the requirements of regulation 13 are met, taking into account the substances the ship is certified to carry. The prewash volume so verified should be adjusted for other prewash conditions by application of the factor k as defined in paragraph 20.

APPENDIX VII

VENTILATION PROCEDURES

- 1 Cargo residues of substances with a vapour pressure greater than 5 KPa at 20°C may be removed from a cargo tank by ventilation.
- 2 Before residues of Noxious Liquid Substances are ventilated from a tank the safety hazards relating to cargo flammability and toxicity should be considered. With regard to safety aspects, the operational requirements for openings in cargo tanks in [SOLAS 74,] the International Bulk Chemical Code, the Bulk Chemical Code, and the ventilation procedures in the International Chamber of Shipping (ICS) Tanker Safety Guide (Chemicals) should be consulted.
- 3 Port authorities may also have regulations on cargo tank ventilation.
- 4 The procedures for ventilation of cargo residues from a tank are as follows:
 - .1 the pipelines should be drained and further cleared of liquid by means of ventilation equipment;
 - .2 the list and trim should be adjusted to the minimum levels possible so that evaporation of residues in the tank is enhanced;
 - .3 ventilation equipment producing an airjet which can reach the tank bottom shall be used. Figure C-1 could be used to evaluate the adequacy of ventilation equipment used for ventilating a tank of a given depth;
 - .4 ventilation equipment should be placed in the tank opening closest to the tank sump or suction point;
 - .5 ventilation equipment should, when practicable, be positioned so that the airjet is directed at the tank sump or suction point and impingement of the airjet on tank structural members is to be avoided as much as possible; and
 - .6 ventilation shall continue until no visible remains of liquid can be observed in the tank. This shall be verified by a visual examination or an equivalent method.

[Insert figure C-1 from page 343]

Figure C-1. Minimum flow rate as a function of jet penetration depth. Jet penetration depth should be compared against tank height.

APPENDIX 2

REVISION OF ANNEX II

OF MARPOL 73/78

for a 5-Category system

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Appendix IV	Standard format for the Procedures and Arrangements Manual
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ANNEX II OF MARPOL 73/78 (Revised)

Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk

CHAPTER 1 - GENERAL

Regulation 1 *Definitions*

For the purposes of this Annex:

- 1 *Anniversary date* means the day and the month of each year which will correspond to the date of expiry of the International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk.
- 2 *Associated piping* means the pipeline from the suction point in a cargo tank to the shore connection used for unloading the cargo and includes all ship's piping, pumps and filters which are in open connection with the cargo unloading line.
- 3 *Ballast water*
Clean ballast means ballast water carried in a tank which, since it was last used to carry a cargo containing a substance in Category A, B, C or D, has been thoroughly cleaned and the residues resulting there from have been discharged and the tank emptied in accordance with the appropriate requirements of this Annex.
Segregated ballast means ballast water introduced into a tank permanently allocated to the carriage of ballast or cargoes other than oil or noxious liquid substances as variously defined in the Annexes of the present Convention, and which is completely separated from the cargo and oil fuel system.
- 4 *Chemical Codes*
Bulk Chemical Code means the Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC.20(22), as amended by the Organization, provided that such amendments are adopted and brought into force in accordance with the provisions of article 16 of the present Convention concerning amendment procedures applicable to an appendix to an Annex.
International Bulk Chemical Code means the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC.19(22), as amended by the Organization, provided that such amendments are adopted and brought into force in accordance with the provisions of article 16 of the present Convention concerning amendment procedures applicable to an appendix to an Annex.
- 5 *Chemical tanker* means a ship constructed or adapted primarily to carry a cargo of noxious liquid substances in bulk and includes an "oil tanker" as defined in Annex I of the present Convention when certified to carry a cargo or part cargo of noxious liquid substances in bulk.

- 6 *Depth of water* means the charted depth.
- 7 *En route* means that the ship is under way at sea on a course or courses, including deviation from the shortest direct route, which as far as practicable for navigational purposes, will cause any discharge to be spread over as great an area of the sea as is reasonable and practicable.
- 8 *Liquid substances* are those having a vapour pressure not exceeding 0.28 MPa absolute at a temperature of 37.8°C.
- 9 *Manual* means Procedures and Arrangements Manual in accordance with the model given in Appendix VI of this Annex.
- [10 *Miscible* means soluble or emulsible with water in all proportions at washwater temperatures.]*
- 11 *Nearest land*. The term “from the nearest land” means from the baseline from which the territorial sea in question is established in accordance with international law, except that, for the purposes of the present Convention “from the nearest land off the north-eastern coast of Australia shall mean from the line drawn from a point on the coast of Australia in

latitude 11°00' S, longitude 142°08' E
to a point in latitude 10°35' S, longitude 141°55' E,
thence to a point latitude 10°00' S, longitude 142°00' E,
thence to a point latitude 9°10' S, longitude 143°52' E,
thence to a point latitude 9°00' S, longitude 144°30' E,
thence to a point latitude 10°41' S, longitude 145°00' E,
thence to a point latitude 13°00' S, longitude 145°00' E,
thence to a point latitude 15°00' S, longitude 146°00' E,
thence to a point latitude 17°30' S, longitude 147°00' E,
thence to a point latitude 21°00' S, longitude 152°55' E,
thence to a point latitude 24°30' S, longitude 154°00' E,
thence to a point on the coast of Australia
- 12 Noxious liquid substance means any substance indicated in the pollution category column of chapter 17 or 18 of the International Bulk Chemical Code or provisionally assessed under the provisions of regulation 6.3 as falling into Category A, B, C or D.
- 13 *Residue* means any noxious liquid substance, which remains for disposal.
- 14 Residue/water mixture means residue to which water has been added for any purpose (e.g. tank cleaning, ballasting, bilge slops).

* This paragraph could be deleted because the word “miscible” is not used in the text.

15 *Ship construction*

Ship constructed means a ship the keel of which is laid or which is at a similar stage of construction. A ship converted to a chemical tanker, irrespective of the date of construction, shall be treated as a chemical tanker constructed on the date on which such conversion commenced. This conversion provision shall not apply to the modification of a ship, which complies with all of the following conditions:

- .1 the ship is constructed before 1 July 1986; and
- .2 the ship is certified under the Bulk Chemical Code to carry only those products identified by the Code as substances with pollution hazards only.

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 tons or one per cent of the estimated mass of all structural material, whichever is less.

16 *Solidifying*

Solidifying substance means a noxious liquid substance which:

- .1 in the case of a substance with a melting point of less than 15°C which is at a temperature of less than 5°C above its melting point at the time of unloading; or
- .2 in the case of a substances with a melting point of equal to or greater than 15°C which is at a temperature of less than 10°C above its melting point at the time of unloading.

Non-solidifying substance means a noxious liquid substance, which is not a solidifying substance.

17 *Special area* means a sea area where for recognized technical reasons in relation to its oceanographic and ecological condition and to the particular character of its traffic the adoption of special mandatory methods for the prevention of sea pollution by noxious liquid substances is required.

For the purpose of this Annex, the special areas are The Baltic Sea Area, The Black Sea Area and The Antarctic Area which are defined as follows:

- .1 "Baltic Sea Area" means the Baltic Sea proper with the Gulf of Bothnia, the Gulf of Finland and gthe entrance to the Baltic Sea bounded by the parallel of the Skaw in the Skagerrak at 57°44.8'N.;
- .2 "Black Sea Area" means the Black Sea proper wiwth the boundary between the Mediterranean and the Black Sea constituted by the parallel 41°N;
- .3 "Antarctic Area" Means the sea area south of latitude 60°S.

18 *Viscosity*

High-viscosity substance means in the case of Category A and B substances and in the case of Category C substances within special areas, a substance with a viscosity equal to or greater than 25 mPa.s at the unloading temperature; and

in the case of Category C substances outside special areas, a substance with a viscosity equal to or greater than 60 mPa.s at the unloading temperature; and

Low-viscosity substance means a noxious liquid substance, which is not a high-viscosity substance.

Regulation 2 Application

1 Unless expressly provided otherwise the provisions of this Annex shall apply to all ships certified to carry noxious liquid substances in bulk.

2 Where a cargo subject to the provisions of Annex I of the present Convention is certified to be carried in a cargo space of a chemical tanker, the appropriate requirements of Annex I of the present Convention shall also apply.

[3 Regulation 12 of this Annex shall apply only to ships certified to carry substances which are categorized for discharge control purposes in Category A, B or C.]¹

Regulation 3 Exceptions

1 The discharge requirements of this Annex shall not apply to the discharge into the sea of noxious liquid substances or mixtures containing such substances when such a discharge:

- .1 is necessary for the purpose of securing the safety of a ship or saving life at sea; or
- .2 results from damage to a ship or its equipment:
 - .2.1 provided that all reasonable precautions have been taken after the occurrence of the damage or discovery of the discharge for the purpose of preventing or minimizing the discharge; and
 - .2.2 except if the owner or the master acted either with intent to cause damage, or recklessly and with knowledge that damage would probably result; or
- .3 is approved by the Administration, when being used for the purpose of combating specific pollution incidents in order to minimize the damage from pollution. Any such discharge shall be subject to the approval of any Government in whose jurisdiction it is contemplated the discharge will occur.

¹ This paragraph could be deleted because the application of regulation 12 is clearly spelled out in that regulation.

Regulation 4 Exemptions

1 With respect to amendments to carriage requirements due to the upgrading of the categorization of a substance, the following shall apply:

- .1 where an amendment to this Annex and the International Bulk Chemical Code and Bulk Chemical Code involves changes to the structure or equipment and fittings due to the upgrading of the requirements for the carriage of certain substances, the Administration may modify or delay for a specified period the application of such an amendment to ships constructed before the date of entry into force of that amendment, if the immediate application of such an amendment is considered unreasonable or impracticable. Such relaxation shall be determined with respect to each substance, having regard to the guidelines developed by the Organization^{*};
- .2 the Administration allowing a relaxation of the application of an amendment under this paragraph shall submit to the Organization a report giving details of the ship or ships concerned, the cargoes certified to carry, the trade in which each ship is engaged and the justification for the relaxation, for circulation to the Parties to the Convention for their information and appropriate action, if any and reflect the exemption on the Certificate as referred to in regulation 8 or 10 of this Annex.

2 Subject to the provisions of paragraph 3 of this paragraph, the provisions of regulation 13.1 need not apply to a ship constructed before 1 July 1986, which is engaged in restricted voyages as determined by the Administration between:

- .1 ports or terminals within a State Party to the present Convention; or
- .2 ports or terminals of States Parties to the present Convention.

3 The provisions of paragraph 2 of this regulation shall only apply to a ship constructed before 1 July 1986, if:

- .1 each time a tank containing Category B or C substances or mixtures is to be washed or ballasted, the tank is washed in accordance with a prewash procedure approved by the Administration in compliance with Appendix VI of this Annex, and the tank washings are discharged to a reception facility;
- .2 subsequent washings or ballast water are discharged to a reception facility or at sea in accordance with other provisions of this Annex;
- .3 the adequacy of the reception facilities at the ports or terminals referred to above, for the purpose of this paragraph, is approved by the Governments of the States Parties to the present Convention within which such ports or terminals are situated;

* Reference is made to Guidelines for the application of amendments to the substances referred to in Chapters 17 and 18 of the International Bulk Chemical Code with respect to pollution hazards adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC(33).

- .4 in the case of ships engaged in voyages to ports or terminals under the jurisdiction of other States Parties to the present Convention, the Administration communicates to the Organization, for circulation to the Parties to the Convention, particulars of the exemption, for their information and appropriate action, if any; and
- .5 the certificate required under this Annex is endorsed to the effect that the ship is solely engaged in such restricted voyages.

4 For a ship whose constructional and operational features are such that ballasting of cargo tanks is not required and cargo tank washing is only required for repair or dry-docking, the Administration may allow exemption from the provisions of regulation 13, provided that all of the following conditions are complied with:

- .1 the design, construction and equipment of the ship are approved by the Administration, having regard to the service for which it is intended;
- .2 any effluent from tank washings which may be carried out before a repair or dry-docking is discharged to a reception facility, the adequacy of which is ascertained by the Administration;
- .3 the certificate required under this Annex indicates:
 - .3.1 that each cargo tank is certified for the carriage of a restricted number of substances which are comparable and can be carried alternately in the same tank without intermediate cleaning; and
 - .3.2 the particulars of the exemption;
- .4 the ship carries a Manual approved by the Administration; and
- .5 in the case of ships engaged in voyages to ports or terminals under the jurisdiction of other States Parties to the present Convention, the Administration communicates to the Organization, for circulation to the Parties to the Convention, particulars of the exemption, for their information and appropriate action, if any.

Regulation 5 *Equivalents*

1 The Administration may allow any fitting, material, appliance or apparatus to be fitted in a ship as an alternative to that required by this Annex if such fitting, material, appliance or apparatus is at least as effective as that required by this Annex. This authority of the Administration shall not extend to the substitution of operational methods to effect the control of discharge of noxious liquid substances as equivalent to those design and construction features which are prescribed by regulations in this Annex.

2 The Administration which allows a fitting, material, appliance or apparatus as alternative to that required by this Annex, under paragraph 1 of this regulation, shall communicate to the Organization for circulation to the Parties to the Convention, particulars thereof, for their information and appropriate action, if any.

3 Notwithstanding the provisions of paragraphs 1 and 2 of this regulation, the construction and equipment of liquefied gas carriers certified to carry noxious liquid substances listed in the applicable Gas Carrier Code, shall be deemed to be equivalent to the construction and equipment requirements contained in regulations 12 and 13 of this Annex, provided that the gas carrier meets all following conditions:

- .1 hold a Certificate of Fitness in accordance with the appropriate Gas Carrier Code for ships certified to carry liquefied gases in bulk;
- .2 hold an International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk, in which it is certified that the gas carrier may carry only those noxious liquid substances identified and listed in the appropriate Gas Carrier Code;
- .3 be provided with segregated ballast arrangements;
- .4 be provided with pumping and piping arrangements which, to the satisfaction of the Administration, ensure that the quantity of cargo residue remaining in the tank and its associated piping after unloading, does not exceed the applicable quantity of residue as required by regulation 13.1 13.2 or 13.3.
- .5 be provided with a Manual, approved by the Administration, ensuring that no operational mixing of cargo residues and water will occur and that no cargo residues will remain in the tank after applying the ventilation procedures prescribed in the Manual.

CHAPTER 2 - CATEGORIZATION OF NOXIOUS LIQUID SUBSTANCES

Regulation 6 *Categorization and listing of noxious liquid substances*

1 For the purpose of the regulations of this Annex, noxious liquid substances shall be divided into four categories as follows:

- .1 Category A: Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a major hazard to either marine resources or human health or cause serious harm to amenities or other legitimate uses of the sea and therefore justify the application of stringent anti-pollution measures;
- .2 Category B: Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and therefore justify the application of special anti-pollution measures;
- .3 Category C: Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a minor hazard to either marine resources or human health or cause minor harm to amenities or other legitimate uses of the sea and therefore require special operational conditions;
- .4 Category D: Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a recognizable hazard to either marine resources or human health or cause minimal harm to amenities or other legitimate uses of the sea and therefore require some attention in operational conditions.

2 Guidelines for use in the categorization of noxious liquid substances are given in Appendix I to this Annex.

3 Where it is proposed to carry a liquid substance in bulk which has not been categorized under paragraph 1 of this regulation or evaluated as referred to in regulation 7.1 of this Annex, the Governments of Parties to the Convention involved in the proposed operation shall establish and agree on a provisional assessment for the proposed operation on the basis of the guidelines referred to in paragraph 2 of this regulation. Until full agreement among the Governments involved has been reached, the substance shall not be carried. As soon as possible, but not later than 30 days after the agreement has been reached, the Government of producing or shipping country initiating the agreement concerned shall notify the Organization and provide details of the substance and the provisional assessment for annual circulation to all Parties for their information. The Organization shall maintain a register of all such substances and their provisional assessment until such time as the substances are formally included in the IBC Code.

Regulation 7 *Other liquid substances*

1 The substances indicated as III in the pollution category column of chapters 17 or 18 of the International Bulk Chemical Code have been evaluated and found to fall outside Category A, B, C and D of this Annex because they are presently considered to present no harm to human

health, marine resources, amenities or other legitimate uses of the sea, when discharged into the sea from tank cleaning or deballasting operation.

2 The discharge of bilge or ballast water or other residues or residue/water mixtures containing only substances indicated as III in the pollution category column of chapters 17 or 18 of the International Bulk Chemical Code shall not be subject to any requirement of this Annex.

CHAPTER 3 - SURVEYS AND CERTIFICATION

Regulation 8 *Survey and certification of chemical tankers*

Notwithstanding the provisions of regulations 9, 10 and 11 of this Annex, chemical tankers which have been surveyed and certified by States Parties to the present Convention in accordance with the provisions of the International Bulk Chemical Code or the Bulk Chemical Code, as applicable, shall be deemed to have complied with the provisions of the said regulations, and the certificate issued under that Code shall have the same force and receive the same recognition as the certificate issued under regulation 10 of this Annex.

Regulation 9 *Surveys*

1 Ships carrying noxious liquid substances in bulk shall be subject to the surveys specified below:

- .1 An initial survey before the ship is put in service or before the Certificate required under regulation 10 of this Annex is issued for the first time, and which shall include a complete survey of its structure, equipment, systems, fittings, arrangements and material in so far as the ship is covered by this Annex. This survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with the applicable requirements of this Annex.
- .2 A renewal survey at intervals specified by the Administration, but not exceeding 5 years, except where regulation 11.2, 11.5, 11.6 or 11.7 of this Annex is applicable. The renewal survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with applicable requirements of this Annex.
- .3 An intermediate survey within 3 months before or after the second anniversary date or within 3 months before or after the third anniversary date of the Certificate which shall take the place of one of the annual surveys specified in paragraph 1.4 of this regulation. The intermediate survey shall be such as to ensure that the equipment and associated pump and piping systems fully comply with the applicable requirements of this Annex and are in good working order. Such intermediate surveys shall be endorsed on the Certificate issued under regulation 11 of this Annex.
- .4 An annual survey within 3 months before or after each anniversary date of the Certificate including a general inspection of the structure, equipment, systems, fittings, arrangements and material referred to in paragraph 1.1 of this regulation to ensure that they have been maintained in accordance with paragraph 3 of this regulation and that they remain satisfactory for the service for which the ship is intended. Such annual surveys shall be endorsed on the Certificate issued under regulation 10 of this Annex.

- .5 An additional survey either general or partial, according to the circumstances, shall be made after a repair resulting from investigations prescribed in paragraph 3 of this regulation, or whenever any important repairs or renewals are made. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory and that the ship complies in all respects with the requirements of this Annex.

2.1 Surveys of ships as regards the enforcement of the provisions of this Annex shall be carried out by officers of the Administration. The Administration may, however, entrust the surveys either to surveyors nominated for the purpose or to organizations recognized by it.

2.2 The Organization, referred to in sub-paragraph 1 of this paragraph shall comply with the Guidelines adopted by the Organization by resolution A.739(18), as may be amended by the Organization, and the specification adopted by the Organization by resolution A.789(19), 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 16 of the present Convention concerning the amendment procedures applicable to this Annex.

2.3 An Administration nominating surveyors or recognizing organizations to conduct surveys as set forth in sub-paragraph 1 of this paragraph shall, as a minimum, empower any nominated surveyor or recognized organization to:

- .1 require repairs to a ship; and
- .2 carry out surveys if requested by the appropriate authorities of a port State.

2.3.1 The Administration shall notify the Organization of the specific responsibilities and conditions of the authority delegated to the nominated surveyors or recognized organizations, for circulation to Parties to the present Convention for the information of their officers.

2.4 When a nominated surveyor or recognized organization determines that the condition of the ship or its equipment does not correspond substantially with the particulars of the Certificate, or is such that the ship is not fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment, such surveyor or organization shall immediately ensure that corrective action is taken and shall in due course notify the Administration. If such corrective action is not taken the Certificate should be withdrawn and the Administration shall be notified immediately, and if the ship is in a port of another Party, the appropriate authorities of the port State shall also be notified immediately. When an officer of the Administration, a nominated surveyor or a recognized organization has notified the appropriate authorities of the port State, the Government of the port State concerned shall give such officer, surveyor or organization any necessary assistance to carry out their obligations under this regulation. When applicable, the Government of the port State concerned shall take such steps as will ensure that the ship shall not sail until it can proceed to sea or leave the port for the purpose of proceeding to the nearest appropriate repair yard available without presenting an unreasonable threat of harm to the marine environment.

2.5 In every case, the Administration concerned shall fully guarantee the completeness and efficiency of the survey and shall undertake to ensure the necessary arrangements to satisfy this obligation.

3.1 The condition of the ship and its equipment shall be maintained to conform with the provisions of the present Convention to ensure that the ship in all respects will remain fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment.

3.2 After any survey of the ship required under paragraph 1 of this regulation has been completed, no change shall be made in the structure, equipment, systems, fittings, arrangements or material covered by the survey, without the sanction of the Administration, except the direct replacement of such equipment and fittings.

3.3 Whenever an accident occurs to a ship or a defect is discovered which substantially affects the integrity of the ship or the efficiency or completeness of its equipment covered by this Annex, the master or owner of the ship shall report at the earliest opportunity to the Administration, the recognized organization or the nominated surveyor responsible for issuing the relevant Certificate, who shall cause investigations to be initiated to determine whether a survey as required by paragraph 1 of this regulation is necessary. If the ship is in a port of another Party, the master or owner shall also report immediately to the appropriate authorities of the port State and the nominated surveyor or recognized organization shall ascertain that such report has been made.”

Regulation 10 *Issue or Endorsement of Certificate*

1 An International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk shall be issued, after an initial or renewal survey in accordance with the provisions of regulation 9 of this Annex, to any ship carrying noxious liquid substances in bulk and which is engaged in voyages to ports or terminals under the jurisdiction of other Parties to the Convention.

2 Such Certificate shall be issued or endorsed either by the Administration or by any person or organization duly authorized by it. In every case, the Administration assumes full responsibility for the Certificate.

3.1 The Government of a Party to the Convention may, at the request of the Administration, cause a ship to be surveyed and, if satisfied that the provisions of this Annex are complied with, shall issue or authorize the issue of an International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk to the ship and, where appropriate, endorse or authorize the endorsement of that Certificate on the ship, in accordance with this Annex.

.2 A copy of the Certificate and a copy of the survey report shall be transmitted as soon as possible to the requesting Administration.

.3 A Certificate so issued shall contain a statement to the effect that it has been issued at the request of the Administration and it shall have the same force and receive the same recognition as the Certificate issued under paragraph 1 of this regulation.

.4 No International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk shall be issued to a ship which is entitled to fly the flag of a State which is not a party.

4 The International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk shall be drawn up in the form corresponding to the model given in Appendix V to this Annex. If the language used is not English, French or Spanish, the text shall include a translation into one of these languages.

Regulation 11 *Duration and Validity of Certificate*

1 An International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk shall be issued for a period specified by the Administration which shall not exceed 5 years.

2.1 Notwithstanding the requirements of paragraph 1 of this regulation, when the renewal survey is completed within 3 months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of expiry of the existing Certificate.

.2 When the renewal survey is completed after the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of expiry of the existing Certificate.

.3 When the renewal survey is completed more than 3 months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of completion of the renewal survey.

3 If a Certificate is issued for a period of less than 5 years, the Administration may extend the validity of the Certificate beyond the expiry date to the maximum period specified in paragraph 1 of this regulation, provided that the surveys referred to in regulation 9.1.3 and 9.1.4 of this Annex applicable, when a Certificate is issued for a period of 5 years, are carried out as appropriate.

4 If a renewal survey has been completed and a new Certificate cannot be issued or placed on board the ship before the expiry date of the existing Certificate, the person or organization authorized by the Administration may endorse the existing Certificate and such a Certificate shall be accepted as valid for a further period which shall not exceed 5 months from the expiry date.

5 If a ship at the time when a Certificate expires is not in a port in which it is to be surveyed, the Administration may extend the period of validity of the Certificate but this extension shall be granted only for the purpose of allowing the ship to complete its voyage to the port in which it is to be surveyed, and then only in cases where it appears proper and reasonable to do so. No Certificates shall be extended for a period longer than 3 months, and a ship to which an extension is granted shall not, on its arrival in the port in which it is to be surveyed, be entitled by virtue of such extension to leave that port without having a new Certificate. When the renewal survey is completed, the new Certificate shall be valid to a date not exceeding 5 years from the date of expiry of the existing Certificate before the extension was granted.

6 A Certificate issued to a ship engaged on short voyages which has not been extended under the foregoing provisions of this regulation may be extended by the Administration for a period of grace of up to one month from the date of expiry stated on it. When the renewal survey is completed, the new Certificate shall be valid to a date not exceeding 5 years from the date of expiry of the existing Certificate before the extension was granted.

7 In special circumstances, as determined by the Administration, a new Certificate need not be dated from the date of expiry of the existing Certificate as required by paragraph 2.2, 5 or 6 of this regulation. In these special circumstances, the new Certificate shall be valid to a date not exceeding 5 years from the date of completion of the renewal survey.

8 If an annual or intermediate survey is completed before the period specified in regulation 9 of this Annex, then:

- .1 The anniversary date shown on the Certificate shall be amended by endorsement to a date which shall not be more than 3 months later than the date on which the survey was completed;
- .2 The subsequent annual or intermediate survey required by regulation 9 of this Annex shall be completed at the intervals prescribed by that regulation using the new anniversary date;
- .3 The expiry date may remain unchanged provided one or more annual or intermediate surveys, as appropriate, are carried out so that the maximum intervals between the surveys prescribed by regulation 9 of this Annex are not exceeded.

9 A Certificate issued under regulation 10 of this Annex shall cease to be valid in any of the following cases:

- .1 If the relevant surveys are not completed within the periods specified under regulation 9.1 of this Annex:
- .2 If the Certificate is not endorsed in accordance with regulation 9.1.3 or 9.1.4 of this Annex;
- .3 Upon transfer of the ship to the flag of another State. A new Certificate shall only be issued when the Government issuing the new Certificate is fully satisfied that the ship is in compliance with the requirements of regulation 9.3.1 and 9.3.2 of this Annex. In the case of a transfer between Parties, if requested within 3 months after the transfer has taken place, the Government of the Party whose flag the ship was formerly entitled to fly shall, as soon as possible, transmit to the Administration copies of the Certificate carried by the ship before the transfer and, if available, copies of the relevant survey reports.

CHAPTER 4 - DESIGN, CONSTRUCTION, ARRANGEMENT AND EQUIPMENT

Regulation 12 *Design, construction, equipment and operations*

1 The design, construction, equipment and operation of ships certified to carry noxious liquid substances of Category A, B or C in bulk, shall be in compliance with the following provisions to minimize the uncontrolled discharge into the sea of such substances:

- .1 the International Bulk Chemical Code when the chemical tanker is constructed on or after 1 July 1986; or
- .2 the Bulk Chemical Code as referred to in paragraph 1.7.2 of that Code for:
 - .2.1 ships for which the building contract is placed on or after 2 November 1973 but constructed before 1 July 1986, and which are engaged on voyages to ports or terminals under the jurisdiction of other States Parties to the Convention; and
 - .2.2 ships constructed on or after 1 July 1983 but before 1 July 1986, which are engaged solely on voyages between ports or terminals within the State the flag of which the ship is entitled to fly.
- .3 The Bulk Chemical Code as referred to in paragraph 1.7.3 of that Code for:
 - .3.1 ships for which the building contract is placed before 2 November 1973 and which are engaged on voyages to ports or terminals under the jurisdiction of other States Parties to the Convention; and
 - .3.2 ships constructed before 1 July 1983, which are solely engaged on, voyages between ports or terminals within the State the flag of which the ship is entitled to fly.

2 In respect of ships other than chemical tankers certified to carry noxious liquid substances of Category A, B or C in bulk, the Administration shall establish appropriate measures based on the Guidelines* developed by the Organization in order to ensure that the provisions shall be such as to minimize the uncontrolled discharge into the sea of such substances.

Regulation 13 *Pumping, piping and unloading arrangements and slop tanks.*

1 Every ship constructed before 1 July 1986 shall be provided with a pumping and piping arrangement to ensure that each tank certified for the carriage of substances in Category B does not retain a quantity of residue in excess of 300 litres in the tank and its associated piping and that each tank certified for the carriage of substances in Category C does not retain a quantity of residue in excess of 900 litres in the tank and its associated piping. A performance test shall be carried out in accordance with Appendix V of this Annex.

* Reference is made to resolution A.673(16).

2 Every ship constructed on or after 1 July 1986 but before 1 January 2007 shall be provided with a pumping and piping arrangement to ensure that each tank certified for the carriage of substances in Category B does not retain a quantity of residue in excess of 100 litres in the tank and its associated piping and that each tank certified for the carriage of substances in Category C does not retain a quantity of residue in excess of 300 litres in the tank and its associated piping. A performance test shall be carried out in accordance with Appendix V of this Annex.

3 Every ship constructed on or after 1 January 2007 shall be provided with a pumping and piping arrangement to ensure that each tank certified for the carriage of substances in Category A, B, C, D or intended for the carriage of substances identified as III does not retain a quantity of residue in excess of 75 litres in the tank and its associated piping. A performance test shall be carried out in accordance with Appendix V of this Annex.

4 Pumping performance tests and conditions referred to in paragraphs 1, 2 and 3 of this regulation shall be approved by the Administration.

5 Every ship certified to carry substances of Category A, B or C shall have an underwater discharge outlet (or outlets) located within the cargo area in the vicinity of the turn of the bilge, and so arranged as to avoid the re-intake of residue/water mixtures by the ship's seawater intakes.

6 The underwater discharge outlet arrangement shall be such that the residue/water mixture discharged into the sea will not pass through the ship's boundary layer. To this end, when the discharge is made normal to the ship's shell plating, the minimum diameter of the discharge outlet is governed by the following equation:

$$d = \frac{Q_d}{5L_d}$$

where

d = minimum diameter of the discharge outlet (m)

L_d = distance from the forward perpendicular to the discharge outlet (m)

Q_d = the maximum rate selected at which the ship may discharge a residue/water mixture through the outlet (m³/h).

7 When the discharge is directed at an angle to the ship's shell plating, the above relationship should be modified by substituting for Q_d the component of Q_d which is normal to the ship's shell plating.

8 *Slop tanks*

Although this Annex does not require the fitting of dedicated slop tanks, slop tanks may be needed for certain washing procedures. Cargo tanks may be used as slop tanks.

CHAPTER 5 - OPERATIONAL DISCHARGES OF RESIDUES OF NOXIOUS LIQUID SUBSTANCES

Regulation 14 *Control of discharges of residues of noxious liquid substances*

Subject to the provisions of regulation 3 of this Annex the control of noxious liquid substances or ballast water, tank washings or other mixtures containing such substances shall be in compliance with the following requirements.

GENERAL PROVISIONS IN ALL AREAS

1 *Discharge provisions*

- .1 The discharge into the sea of residues of substances in Category A, B, C or D, or of those provisionally assessed as such or ballast water, tank washings or other mixtures containing such substances shall be prohibited unless such discharges are made in full compliance with the applicable operational requirements contained in this Annex.
- .2 Before any prewash or discharge procedure is carried out in accordance with this regulation, the applicable tank shall be unloaded in accordance with the procedures and arrangements prescribed in the Manual.
- .3 The carriage of substances which have not been categorized, provisionally assessed or evaluated as referred to in regulations 6 or 7 of this Annex or of ballast water, tank washings or other mixtures containing such residues shall be prohibited along with any consequential discharge of such substances into the sea.

2 *Discharge standards*

Where the provisions in this regulation allow the discharge into the sea of substances in category A, B or C or of those provisionally assessed as such or ballast water, tank washings or other mixtures containing such substances the following discharge standards shall apply:

- .1 the ship is proceeding en route at a speed of at least 7 knots in the case of self-propelled ships or at least 4 knots in the case of ships which are not self-propelled;
- .2 the discharge is made below the waterline through the underwater discharge outlet(s) not exceeding the maximum rate for which the underwater discharge outlet(s) is (are) designed; and
- .3 the discharge is made at a distance of not less than 12 nautical miles from the nearest land in a depth of water of not less than 25 metres.

3 *Ventilation of cargo residues*

Ventilation procedures approved by the Administration may be used to remove cargo residues from a tank. Such procedures shall be in accordance with Appendix VII of this Annex. Any

water subsequently introduced into the tank shall be regarded as clean and shall not be subject to the discharge requirements in this Annex.

4 *Exemption for a prewash*

On request of the ship's master an exemption for a prewash may be granted by the Government of the receiving Party, where it is satisfied that:

- .1 the unloaded tank is to be reloaded with the same substance or another substance compatible with the previous one and that the tank will not be washed or ballasted prior to loading; or
- .2 The unloaded tank is neither washed nor ballasted at sea and the prewash in accordance with the applicable paragraph of this regulation shall be carried out at another port provided that it has been confirmed in writing that a reception facility at that port is available and is adequate for such a purpose; or
- .3 the cargo residues will be removed by a ventilation procedure approved by the Administration in accordance with Appendix VII of this Annex.

5 *The use of cleaning agents or additives*

5.1 When a washing medium other than water, such as, mineral oil or chlorinated solvent, is used instead of water to wash a tank, its discharge shall be governed by the provisions of either Annex I or Annex II, which would apply to the medium had it been carried as cargo. Tank washing procedures involving the use of such a medium shall be set out in the Manual and be approved by the Administration.

5.2 When small amounts of cleaning additives (detergent products) are added to water in order to facilitate tank washing, no additives containing pollution Category A components shall be used except those components that are readily biodegradable and present in a total concentration of less than 10% of the cleaning additive. No restrictions additional to those applicable to the tank due to the previous cargo shall apply.

6 *Responsibilities of the master*

The master shall ensure that no discharges into the sea of cargo residues or residue/water mixtures containing substances in Category A, B, C or D will take place, unless such discharges are made in full compliance with the operational procedures contained in the Manual.

DISCHARGE OF RESIDUES OF NOXIOUS LIQUID SUBSTANCES OUTSIDE SPECIAL AREAS

Subject to the provisions of paragraph 1 the following provisions shall apply for:

7 *Category A*

7.1 A tank, which has been unloaded, shall be prewashed before the ship leaves the port of unloading. The resulting residues shall be discharged to a reception facility until the concentration of the substance in the effluent to such facility, as indicated by analyses of samples of the effluent taken by the surveyor, is at or below 0.1% by weight. When the required concentration level has been achieved, remaining tank washings shall continue to be discharged

to the reception facility until the tank is empty. Appropriate entries of these operations shall be made in the Cargo Record Book and endorsed by the surveyor referred to in regulation 17.

7.2 Any water subsequently introduced into the tank may be discharged into the sea in accordance with the discharge standards in paragraph 2 of this regulation.

7.3 Where the Government of the receiving party is satisfied that it is impracticable to measure the concentration of the substance in the effluent without causing undue delay to the ship, that Party may accept an alternative procedure as being equivalent to obtain the required concentration in paragraph 7.1 of this regulation provided that:

- .1 the tank is prewashed in accordance with a procedure approved by the Administration and in compliance with Appendix VI of this Annex; and
- .2 appropriate entries shall be made in the Cargo Record Book and endorsed by the surveyor referred to in regulation 17.1.

8 *Category B and C*

8.1 With respect to the residue discharge procedures for substances in Category B or C the discharge standards in paragraph 2 of this regulation shall apply.

8.2 If the unloading of a substance in Category B or C is not carried out in accordance with the Manual, a prewash shall be carried out before the ship leaves the port of unloading, unless alternative measures are taken to the satisfaction of the surveyor referred to in regulation 17.1 of this Annex to remove the cargo residues from the ship to quantities specified in this Annex. The resulting tank washings of the prewash shall be discharged to a reception facility at the port of unloading or another port with a suitable reception facility provided that it has been confirmed in writing that a reception facility at that port is available and is adequate for such a purpose.

8.3 With respect to the prewash and residue discharge procedures for high-viscosity or solidifying substances in Category B or Category C the following shall apply:

- .1 a prewash procedure as specified in Appendix VI shall be applied;
- .2 the residue/water mixture generated during the prewash shall be discharged to a reception facility until the tank is empty; and
- .3 any water subsequently introduced into the tank may be discharged into the sea in accordance with the discharge standards in paragraph 2 of this regulation.

9 *Category D*

9.1 With respect to the residue discharge procedures for substances in Category D, the following shall apply:

- .1 the ship is proceeding en route at a speed at least 7 knots in the case of self-propelled ships or at least 4 knots in the case of ships which are not self-propelled;
- .2 such mixtures are of a concentration not greater than one part of the substance in ten parts of water; and

- .3 the discharge is made at a distance of not less than 12 nautical miles from the nearest land.

[9.2 If the unloading of a substance in Category D is not carried out in accordance with the Manual, a prewash shall be carried out before the ship leaves the port of unloading, unless alternative measures are taken to the satisfaction of the surveyor referred to in regulation 17.1 of this Annex to remove the cargo residues from the ship to quantities specified in this Annex. The resulting tank washings of the prewash shall be discharged to a reception facility at the port of unloading or another port with a suitable reception facility provided that it has been confirmed in writing that a reception facility at that port is available and is adequate for such a purpose.]¹

10 Operational requirements for ballasting and deballasting

10.1 After unloading, and, if required, after a prewash, a cargo tank may be ballasted. Procedures for the discharge of such ballast are set out in paragraph 2 of this regulation.

10.2 Ballast introduced into a cargo tank which has been washed to such an extent that the ballast contains less than 1 ppm of the substance previously carried, may be discharged into the sea without regard to the discharge rate, ship's speed and discharge outlet location, provided that the ship is not less than 12 miles from the nearest land and in water that is not less than 25 metres deep. The required degree of cleanliness has been achieved when a prewash as specified in Appendix VI has been carried out and the tank has been subsequently washed with water quantity not less than that calculated with $k = 1.0$.

10.3 Discharge into the sea of clean ballast or segregated ballast shall not be subject to the requirement of this Annex.

DISCHARGE OF RESIDUES OF NOXIOUS LIQUID SUBSTANCES WITHIN SPECIAL AREAS

Subject to the provisions of paragraph 1 and paragraph 15 of this regulation the following provisions shall apply for:

11 *Category A*

11.1 A tank, which has been unloaded, shall be prewashed before the ship leaves the port of unloading. The resulting residues shall be discharged to a reception facility until the concentration of the substance in the effluent to such facility, as indicated by analyses of samples of the effluent taken by the surveyor, is at or below 0.05% by weight. When the required concentration level has been achieved, remaining tank washings shall continue to be discharged to the reception facility until the tank is empty. Appropriate entries of these operations shall be made in the Cargo Record Book and endorsed by the surveyor referred to in regulation 17.

11.2 Any water subsequently introduced into the tank may be discharged into the sea in accordance with the discharge standards in paragraph 2 of this regulation.

11.3 Where the Government of the receiving Party is satisfied that it is impracticable to measure the concentration of the substance in the effluent without causing undue delay to the ship, that Party may accept an alternative procedure as being equivalent to obtain the required concentration in paragraph 11.1 of this regulation provided that:

¹ This is a substantial change which require further consideration
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- .1 the tank is prewashed in accordance with a procedure approved by the Administration and in accordance with Appendix VI of this Annex; and
- .2 appropriate entries shall be made in the Cargo Record Book and endorsed by the surveyor referred to in regulation 17. 1.

12 *Category B*

12.1 With respect to the prewash and residue discharge procedures for substances in Category B the following shall apply:

- .1 a prewash procedure as specified in Appendix VI of this Annex shall be applied;
- .2 the residue/water mixture generated during the prewash shall be discharged to a reception facility until the tank is empty; and
- .3 any water subsequently introduced into the tank may be discharged into the sea in accordance with the discharge standards in paragraph 2 of this regulation.

13 *Category C*

13.1 With respect to the residue discharge procedures of low-viscosity and non-solidifying substances in Category C the discharge standards in paragraph 2 of this regulation shall apply.

13.2 If the unloading of a low-viscosity and non-solidifying substance of Category C is not carried out in accordance with the Manual, a prewash shall be carried out before the ship leaves the port of unloading, unless alternative measures are taken to the satisfaction of the surveyor referred to in regulation 17.1 of this Annex to remove the cargo residues from the ship to quantities specified in this Annex. The resulting tank washings of the prewash shall be discharged to a reception facility at the port of unloading or another port with a suitable reception facility, provided that it has been confirmed in writing that a reception facility at that port is available and is adequate for such a purpose.

13.3 With respect to the prewash and residue discharge procedures for high-viscosity or solidifying substances in Category C the following shall apply:

- .1 a prewash procedure as specified in Appendix VI shall be applied;
- .2 the residue/water mixture generated during the prewash shall be discharged to a reception facility; and
- .3 any water subsequently introduced into the cargo tank may be discharged into the sea in accordance with the discharge standards in paragraph 2 of this regulation.

14 Nothing in this regulation shall prohibit a ship from retaining on board the residues or residue/water mixtures containing only low viscosity, non-solidifying substances from a Category B or C cargo and discharging such residues into the sea outside a special area in accordance with paragraph 2 of this regulation.

15 *Discharges in the Antarctic area*

15.1 In respect of the Antarctic area any discharge into the sea of noxious liquid substances or mixtures containing such substances shall be prohibited.

Regulation 15 *Procedures and Arrangements Manual*

1 Every ship certified to carry substances of Category A, B, C or D shall have on board a Manual approved by the Administration. The Manual shall have a standard format in compliance with Appendix IV to this Annex. In the case of a ship engaged in international voyages and the language used is not English, French or Spanish, the text shall include a translation into one of these languages.

2 The main purpose of the Manual is to identify for the ship's officers the physical arrangements and all the operational procedures with respect to cargo handling, tank cleaning, slops handling and cargo tank ballasting and deballasting which must be followed in order to comply with the requirements of this Annex.

Regulation 16 *Cargo Record Book*

1 Every ship to which this Annex applies shall be provided with a Cargo Record Book, whether as part of the ship's official log-book or otherwise, in the form specified in Appendix II to this Annex.

2 After completion, all cargo and ballasting operations shall be recorded for each tank in the Cargo Record Book

3 In the event of an accidental discharge or a discharge under regulation 3 of this Annex of a noxious liquid substance or mixture containing such a substance, an entry shall be made in the Cargo Record Book stating the circumstances of, and the reason for, the discharge.

4 Each entry shall be signed by the officer or officers in charge of the operation concerned and each page shall be signed by the master of the ship. The entries in the Cargo Record Book, for ships holding an International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk or a certificate referred to in regulation 8 of this Annex shall be at least in English, French or Spanish. Where entries in an official national language of the State whose flag the ship is entitled to fly are also used, this shall prevail in case of a dispute or discrepancy.

5 The Cargo Record Book shall be kept in such a place as to be readily available for inspection and, except in the case of unmanned ships under tow, shall be kept on board the ship. It shall be retained for a period of three years after the last entry has been made.

6 The competent authority of the Government of a Party may inspect the Cargo Record Book on board any ship to which this Annex applies while the ship is in its port, and may make a copy of any entry in that book and may require the master of the ship to certify that the copy is a true copy of such entry. Any copy so made which has been certified by the master of the ship as a true copy of an entry in the ship's Cargo Record Book shall be made admissible in any judicial proceedings as evidence of the facts stated in the entry. The inspection of a Cargo Record Book and the taking of a certified copy by the competent authority under this paragraph shall be performed as expeditiously as possible without causing the ship to be unduly delayed.

CHAPTER 6 - MEASURES OF CONTROL BY PORT STATES

Regulation 17 *Measures of control*

1 The Government of each Party to the Convention shall appoint or authorize surveyors for the purpose of implementing this regulation. The surveyors shall execute control in accordance with control procedures developed by the Organization.

2 When a surveyor appointed or authorized by the Government of the Party to the Convention has verified that an operation has been carried out in accordance with the requirements of this Annex, or has granted an exemption for a prewash, then that surveyor shall make an appropriate entry in the Cargo Record Book.

3 The master of a ship certified to carry noxious liquid substances in bulk shall ensure that the provisions of regulation 14 of this Annex have been complied with and that the Cargo Record Book is completed in accordance with regulation 16 of this Annex whenever operations as referred to in that regulation take place.

4 A tank which has carried a Category A substance shall be prewashed in accordance with regulation 14.7 or 14.11. The appropriate entries of these operations shall be made in the Cargo Record Book and endorsed by the surveyor referred to under paragraph 1 of this regulation.

5 Where the Government of the receiving party is satisfied that it is impracticable to measure the concentration of the substance in the effluent without causing undue delay to the ship, that Party may accept the alternative procedure referred to in regulations 14.7.3 and 14.11.3 of this Annex, provided that the surveyor referred to under paragraph 1 of this regulation certifies in the Cargo Record Book that:

- .1 the tank, its pump and piping systems have been emptied; and
- .2 the prewash has been carried out in accordance with the provisions of Appendix VI of this Annex; and
- .3 the tank washing resulting from such prewash have been discharged to a reception facility and the tank is empty.

6 At the request of the ship's master, the Government of the receiving Party may exempt the ship from the requirements for a prewash referred to in the applicable paragraphs of regulation 14 of this Annex, when one of the conditions of regulation 14.4 is met.

7 An exemption referred to in paragraph 6 of this regulation may only be granted by the Government of the receiving Party to a ship engaged in voyages to ports or terminals under the jurisdiction of other States Parties to the present Convention. When such an exemption has been granted, the appropriate entry made in the Cargo Record Book shall be endorsed by the surveyor referred to in paragraph 1 of this regulation.

8 If the unloading is not carried out in accordance with the pumping conditions for the tank approved by the Administrations and based on Appendix V of this Annex, alternative measures may be taken to the satisfaction of the surveyor referred to in paragraph 1 of this regulation to

remove the cargo residues from the ship to quantities specified in regulation 13 of this Annex as applicable. The appropriate entries shall be made in the Cargo Record Book.

9 *Port State control on operational requirements**

9.1 A ship when in a port of another Party is subject to inspection by officers duly authorized by such Party concerning operational requirements under this Annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by noxious liquid substances.

9.2 In the circumstances given in paragraph 9.1 of this regulation, the Party shall take such steps as will ensure that the ship shall not sail until the situation has been brought to order in accordance with the requirements of this Annex.

9.3 Procedures relating to the port State control prescribed in article 5 of the present Convention shall apply to this regulation.

9.4 Nothing in this regulation shall be construed to limit the rights and obligations of a Party carrying out control over operational requirements specifically provided for in the present Convention.

* Refer to the Procedures for port State control adopted by the Organization by resolution A.787(19); see IMO sales publication IMO-650E.

CHAPTER 7 - PREVENTION OF POLLUTION ARISING FROM AN INCIDENT INVOLVING NOXIOUS LIQUID SUBSTANCES

Regulation 18 *Shipboard marine pollution emergency plan for noxious liquid substances.*

1 Every ship of 150 gross tonnage and above certified to carry noxious liquid substances in bulk shall carry on board a shipboard marine pollution emergency plan for noxious liquid substances approved by the Administration.

2 Such a plan shall be based on the Guidelines* developed by the Organization and written in a working language or languages understood by the master and officers. The plan shall consist at least of:

- .1 the procedure to be followed by the master or other persons having charge of the ship to report a noxious liquid substances pollution incident, as required in article 8 and Protocol I of the present Convention, based on the Guidelines developed by the Organization**;
- .2 the list of authorities or persons to be contacted in the event of a noxious liquid substances pollution incident;
- .3 a detailed description of the action to be taken immediately by persons on board to reduce or control the discharge of noxious liquid substances following the incident; and
- .4 the procedures and point of contact on the ship for co-ordinating shipboard action with national and local authorities in combating the pollution.

3 In the case of ships to which regulation 35 of Annex I of the Convention also apply, such a plan may be combined with the shipboard oil pollution emergency plan required under regulation 35 of Annex I of the Convention. In this case, the title of such a plan shall be “Shipboard marine pollution emergency plan”.

* Refer to “Guidelines for the development of shipboard marine pollution emergency plans for oil and/or noxious liquid substances” adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC.54(32), as amended by resolution MEPC 86(44).

** Refer to General Principles for Ship Reporting Systems and Ship Reporting Requirements, including Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants adopted by the Organization by resolution A.851(20).

CHAPTER 8 - RECEPTION FACILITIES

Regulation 19 *Reception facilities and cargo unloading terminal arrangements*

1 The Government of each Party to the Convention undertakes to ensure the provision of reception facilities according to the needs of ships using its ports, terminals or repair ports as follows:

- .1 Ports and terminals involved in ship's cargo handling shall have adequate facilities for reception of residues and mixtures containing such residues of noxious liquid substances resulting from the application of this Annex, without undue delay for the ships involved.
- .2 ship repair ports undertaking repairs to chemical tankers shall have facilities adequate for the reception of residues and mixtures containing noxious liquid substances for ships calling at that port.

2 The Government of each Party shall determine the types of facilities provided for the purpose of paragraph 1 of this regulation at each cargo loading and unloading port, terminal and ship repair port in its territories and notify the Organization thereof.

3 The Governments of Parties to the Convention, the coastlines of which border on any given special area, shall collectively agree and establish a date by which time the requirement of paragraph 1 of this regulation will be fulfilled and from which the requirements of the applicable paragraphs of regulation 14 in respect of that area shall take effect and notify the Organization of the date so established at least six months in advance of that date. The Organization shall then promptly notify all Parties of that date.

4 The Government of each Party to the Convention shall undertake to ensure that cargo unloading terminals shall provide arrangements to facilitate stripping of cargo tanks of ships unloading noxious liquid substances at these terminals. Cargo hoses and piping systems of the terminal, containing noxious liquid substances received from ships unloading these substances at the terminal, shall not be drained back to the ship.

5 Each Party shall notify the Organization, for transmission to the Parties concerned, of any case where facilities required under paragraph 1 or arrangements required under paragraph 3 of this regulation are alleged to be inadequate.

Appendices to Annex II

Appendix I

Guidelines for the categorization of noxious liquid substances.

Products are assigned to Pollution Categories based on an evaluation of their properties as reflected in the resultant GESAMP Hazard Profile as shown in the table below:

Rule	A1 Bioaccumulation	A2 Biodegradation	B1 Acute toxicity to marine organisms	B2 Chronic toxicity to marine organisms	D3 Remarks	E2 Effects on marine wildlife and on benthic habitats	Pollution Category
1			≥ 5				A
2	≥ 4		4				
3		NR	4				
4	≥ 4	NR			CMRTNI		
5			4				B
6			3				
7			2				C
8	≥ 4	NR		Not 0			D
9				≥ 1			
10						F or S If not inorganic	
11					CMRTNI		
12			1				OS¹
13	All other products						

¹ Other substances, regulation 7 refers.
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Abbreviated legend to the revised GESAMP Hazard Evaluation Procedure

Columns A and B - Aquatic Environment					
A			B		
Bioaccumulation and Biodegradation			Aquatic Toxicity		
Numerical Rating	A 1 Bioaccumulation		A 2 Biodegradation	B 1 Acute Toxicity	B 2 Chronic Toxicity
	log Pow	BCF		LC/EC/IC ₅₀ (mg/l)	NOEC (mg/l)
0	<1 or > ca. 7	not measurable		>1000	>1
1	≥1 - <2	≥1 - <10	R: readily biodegradable	>100 - ≤1000	>0.1 - ≤1
2	≥2 - <3	≥10 - <100		>10 - ≤100	>0.01 - ≤0.1
3	≥3 - <4	≥100 - <500	NR: not readily biodegradable	>1 - ≤10	>0.001 - ≤0.01
4	≥4 - <5	≥500 - <4000		>0.1 - ≤1	≤0.001
5	≥5	≥4000		>0.01 - ≤0.1	
6				≤0.01	

Columns C and D - Human Health (Toxic effects to mammals)						
C			D			
Acute Mammalian Toxicity			Irritation, Corrosion & Long term health effects			
Numerical Ratings	C 1 Oral Toxicity LD ₅₀ (mg/kg)	C 2 Percutaneous Toxicity LD ₅₀ (mg/kg)	C 3 Inhalation Toxicity LC ₅₀ (mg/l)	D 1 Skin irritation & corrosion	D 2 Eye irritation & corrosion	D 3 Long term health effects
0	>2000	>2000	>20	not irritating	not irritating	C - Carcinogen M - Mutagenic R - Reprotoxic S - Sensitizing A -Aspiration haz. T - Target organ systemic toxicity L - Lung injury N - Neurotoxic I - Immunotoxic
1	>300 - ≤2000	>1000 - ≤2000	>10 - ≤20	mildly irritating	mildly irritating	
2	>50 - ≤300	>200 - ≤1000	>2 - ≤10	irritating	irritating	
3	>5 - ≤50	>50 - ≤200	>0.5 - ≤2	3 Severely irritating or corrosive 3A Corr. (≤4hr) 3B Corr. (≤1hr) 3C Corr. (≤3m)	severely irritating	
4	≤5	≤50	≤0.5			

Column E Interferences with other Uses of the Sea			
E 1 Tainting	E 2 Physical effects on Wildlife & benthic habitats	E 3 Interference with Coastal Amenities	
		Numerical Rating	Description & Action
NT: not tainting (tested) T: tainting test positive	Ep: Persistent Floater E: Floater S: Sinking Substances	0	no interference no warning
		1	slightly objectionable warning, no closure of amenity
		2	moderately objectionable possible closure of amenity
		3	highly objectionable closure of amenity

APPENDIX II

Form of Cargo Record Book for Ships Carrying Noxious Liquid Substances in Bulk

**CARGO RECORD BOOK FOR SHIPS
CARRYING NOXIOUS LIQUID SUBSTANCES IN BULK**

Name of ship.....

Distinctive number or letters.....

IMO Number.....

Gross tonnage.....

Period from.....to.....

INTRODUCTION

The following pages show a comprehensive list of items of cargo and ballast operations which are, when appropriate, to be recorded in the Cargo Record Book on a tank-to-tank basis as required by regulation 16.2 of Annex II of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), as amended. The items have been grouped into operational sections, each of which is denoted by a letter.

When making entries in the Cargo Record Book, the date, operational code and item number shall be inserted in the appropriate columns and the required particulars shall be recorded chronologically in the blank spaces

Each completed operation shall be signed for and dated by the officer or officers in charge and, if applicable, by a surveyor authorized by the competent authority of the State in which the ship is unloading. Each completed page shall be countersigned by the master of the ship.

Entries in the Cargo Record Book are required for operations involving substances of all Pollution Categories.

For the category of a substance, refer to table 1 of the ship's Procedures and Arrangements Manual.

List of items to be recorded

Entries are required for operations involving all Categories of substances.

(A) Loading of cargo

1. Place of loading.
2. Identify tank(s), name of substance(s) and category(ies).

(B) Internal transfer of cargo

3. Name and category of cargo(es) transferred.
4. Identity of tanks:
 - .1 from:
 - .2 to:
5. Was (were) tank(s) in 4.1 emptied?
6. If not, quantity remaining in tank(s).

(C) Unloading of cargo

7. Place of unloading.
8. Identity of tank(s) unloaded.
9. Was (were) tank(s) emptied?
 - .1 If yes, confirm that the procedure for emptying and stripping has been performed in accordance with the ship's Procedures and Arrangements Manual (i.e. list, trim, stripping temperature).
 - .2 If not, quantity remaining in tank(s).
10. Does the ship's Procedures and Arrangements Manual require a prewash with subsequent disposal to reception facilities?
11. Failure of pumping and/or stripping system:
 - .1 time and nature of failure;
 - .2 reasons for failure;
 - .3 time when system has been made operational.

(D) Mandatory prewash in accordance with the ship's Procedures and Arrangements Manual

12. Identify tank(s), substance(s) and category(ies).

13. Washing method:

.1 number of washing machines per tank;

.2 duration of wash/washing cycles;

.3 hot/cold wash.

14. Prewash slops transferred to:

.1 reception facility in unloading port (identify port)*;

.2 reception facility otherwise (identify port)*.

(E) Cleaning of cargo tanks except mandatory prewash (other prewash operations, final wash, ventilation etc.)

15. State time, identify tank(s), substance(s) and category(ies) and state:

.1 washing procedure used;

.2 cleaning agent(s) (identify agent(s) and quantities);

.3 ventilation procedure used (state number of fans used, duration of ventilation).

16. Tank washings transferred:

.1 into the sea;

.2 to reception facility (identify port)*;

.3 to slops collecting tank (identify tank).

(F) Discharge into the sea of tank washings

17. Identify tank(s):

.1 Were tank washings discharged during cleaning of tank(s)? If so at what rate?

.2 Were tank washing(s) discharged from a slops collecting tank? If so, state quantity and rate of discharge.

* Ship's masters should obtain from the operator of the reception facilities, which include barges and tank trucks, a receipt or certificate specifying the quantity of tank washings transferred, together with the time and date of the transfer. The receipt or certificate should be kept together with the cargo record book.

18. Time pumping commenced and stopped.

19. Ship's speed during discharge.

(G) Ballasting of cargo tanks

20. Identity of tank(s) ballasted.

21. Time at start of ballasting.

(H) Discharge of ballast water from cargo tanks

22. Identity of tank(s).

23. Discharge of ballast:

.1 into the sea;

.2 to reception facilities (identify port) *.

24. Time ballast discharge commenced and stopped.

25. Ship's speed during discharge.

(I) Accidental or other exceptional discharge

26. Time of occurrence.

27. Approximate quantity, substance(s) and category(ies).

28. Circumstances of discharge or escape and general remarks.

(J) Control by authorized surveyors

29. Identify port.

30. Identify tank(s), substance(s), category(ies) discharged ashore.

31. Have tank(s), pump(s), and piping system(s) been emptied?

32. Has a prewash in accordance with the ship's Procedures and Arrangements Manual been carried out?

33. Have tank washings resulting from the prewash been discharged ashore and is the tank empty?

34. An exemption has been granted from mandatory prewash.

* Ship's masters should obtain from the operator of the reception facilities, which include barges and tank trucks, a receipt or certificate specifying the quantity of tank washings transferred, together with the time and date of the transfer. The receipt or certificate should be kept together with the cargo record book.

35. Reasons for exemption.
36. Name and signature of authorized surveyor.
37. Organization, company, government agency for which surveyor works.

(K) Additional operational procedures and remarks

APPENDIX III

Form of International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk

INTERNATIONAL POLLUTION PREVENTION CERTIFICATE FOR THE CARRIAGE OF NOXIOUS LIQUID SUBSTANCES IN BULK

Issued under the provisions of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended (hereinafter referred to as "the Convention") under the authority of the Government of:

.....
(full designation of the country)

by.....
(full designation of the competent person or organization authorized under the provisions of the Convention)

Particulars of ship²

Name of ship

Distinctive number or letters.....

Port of registry.....

Gross tonnage.....

IMO Number.....

² Alternatively, the particulars of the ship may be placed horizontally in boxes.
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THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with regulation 9 of Annex II of the Convention.
- 2 That the survey showed that the structure, equipment, systems, fitting, arrangements and material of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the applicable requirements of Annex II of the Convention.
- 3 That the ship has been provided with a Procedures and Arrangements Manual as required by regulation 15 of Annex II of the Convention, and that the arrangements and equipment of the ship prescribed in the Manual are in all respects satisfactory.
- 4 That the ship is suitable for the carriage in bulk of the following noxious liquid substances, provided that all relevant operational provisions of Annex II of the Convention are observed.

Noxious liquid substances	Conditions of carriage (tank numbers etc.)
Continued on additional signed and dated sheets	

This certificate is valid until...subject to surveys in accordance with regulation 9 of Annex II of the Convention.

Completion date of the survey on which this certificate is based: dd/mm/yy

Issued

at.....

(Place of issue of certificate)

.....
(Date of issue)

.....
(Signature of authorized official issuing the certificate)

(Seal or stamp of the authority, as appropriate)

ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS

THIS IS TO CERTIFY that, at a survey required by regulation 9 of Annex II of the Convention, the ship was found to comply with the relevant provisions of the Convention:

Annual survey: Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

Annual/Intermediate survey* : Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

Annual/Intermediate survey* : Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

Annual survey: Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

* delete as appropriate

**ANNUAL/INTERMEDIATE SURVEY IN ACCORDANCE
WITH REGULATION 11.8.3**

THIS IS TO CERTIFY that, at an annual/intermediate survey in accordance with regulation 11.8.3 of Annex II of the Convention, the ship was found to comply with the relevant provisions of the Convention:

Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

**ENDORSEMENT TO EXTEND THE CERTIFICATE IF VALID
FOR LESS THAN 5 YEARS WHERE REGULATION 11.3 APPLIES**

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with regulation 11.3 of Annex II of the Convention, be accepted as valid until

Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

**ENDORSEMENT WHERE THE RENEWAL SURVEY HAS BEEN
COMPLETED AND REGULATION 11.4 APPLIES**

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with regulation 11.4 of Annex II of the Convention, be accepted as valid until

Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

ENDORSEMENT TO EXTEND THE VALIDITY OF THE CERTIFICATE UNTIL REACHING THE PORT OF SURVEY OR FOR A PERIOD OF GRACE WHERE REGULATION 11.5 OR 11.6 APPLIES

This Certificate shall, in accordance with regulation 11.5 or 11.6 of Annex II of the Convention, be accepted as valid until

Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

ENDORSEMENT FOR ADVANCEMENT OF ANNIVERSARY DATE WHERE REGULATION 11.8 APPLIES

In accordance with regulation 11.8 of Annex II of the Convention, the new anniversary date is

Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

In accordance with regulation 11.8 of Annex II of the Convention, the new anniversary date is

Signed.....
(Signature of authorized official)

Place.....

Date.....

(Seal or stamp of the authority, as appropriate)

APPENDIX IV

Standard Format of the Procedures and Arrangements Manual

Note 1: The standard format consists of a standardized text of an introduction, of an index and of the leading paragraphs to each section. This standardized text should be reproduced in the Manual provided for each ship followed by the information necessary to complete each section as applicable to the particular ship. The necessary information is indicated within with left-hand marking. When a section is not applicable, ``NA" should be entered. It is recognized that the content of the Manual will vary depending on the design of the ship, the trade and the types of cargoes intended to be carried.

Note 2: If the Administration requires or accepts information and operational instructions in addition to those outlined in this Standard Format, they should be included in Addendum D of the Manual

STANDARD FORMAT

MARPOL 73/78 ANNEX II PROCEDURES AND ARRANGEMENTS MANUAL

Name of ship:

Distinctive number or letters:

IMO Number.....

Port of registry:

Approval stamp of Administration:

INTRODUCTION

1 The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (hereinafter referred to as MARPOL 73/78) was established in order to prevent the pollution of the marine environment by discharges into the sea from ships of harmful substances or effluents containing such substances. In order to achieve its aim, MARPOL 73/78 contains six annexes in which detailed regulations are given with respect to the handling on board ships and the discharge into the sea or release into the atmosphere of six main groups of harmful substances, i.e. Annex I (mineral oils), Annex II (noxious liquid substances carried in bulk), Annex III (harmful substances carried in packaged forms), Annex IV (sewage) Annex V (garbage) and Annex VI (Air Pollution).

2 Regulation 14 of Annex II of MARPOL 73/78 (hereinafter referred to as Annex II) prohibits the discharge into the sea of noxious liquid substances of Categories A, B, C and D or of ballast water, tank washings or other residues or mixtures containing such substances, except in compliance with specified conditions including procedures and arrangements based upon standards developed by the International Maritime Organization (IMO) to ensure that the criteria specified for each Category will be met.

3 Annex II requires that each ship which is certified for the carriage of noxious liquid substances in bulk shall be provided with a Procedures and Arrangements Manual, hereinafter referred to as the Manual.

4 This Manual has been written in accordance with Appendix IV of Annex II and is concerned with the marine environmental aspects of the cleaning of cargo tanks and the discharge of residues and mixtures from these operations. The Manual is not a safety guide and reference should be made to other publications specifically to evaluate safety hazards.

5 The purpose of the Manual is to identify the arrangements and equipment required to enable compliance with Annex II and to identify for the ship's officers all operational procedures with respect to cargo handling, tank cleaning, slops handling, residue discharging, ballasting and deballasting, which must be followed in order to comply with the requirements of Annex II.

6 In addition, this Manual, together with the ship's Cargo Record Book and [International Certificate for the Carriage of Noxious Liquid Substances in Bulk/Certificate of Fitness issued under the International Bulk Chemical Code/Certificate of Fitness issued under the Bulk Chemical Code]*, will be used by Administrations for control purposes in order to ensure full compliance with the requirements of Annex II by this ship.

7 The master shall ensure that no discharges into the sea of cargo residues or residue/water mixtures containing Category A, B, C or D substances shall take place, unless such discharges are made in full compliance with the operational procedures contained in this Manual.

8 This Manual has been approved by the Administration and no alteration or revision shall be made to any part of it without the prior approval of the Administration.

* Delete as appropriate.
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INDEX OF SECTIONS

- 1 Main features of MARPOL 73/78, Annex II
 - 2 Description of the ship's equipment and arrangements
 - 3 Cargo unloading procedures and tank stripping
 - 4 Procedures relating to the cleaning of cargo tanks, the discharge of residues, ballasting and deballasting
- Table 1 : List of noxious liquid substances allowed to be carried
- Table 2 : Cargo tank information
- Addendum A : Flow diagrams
- Addendum B : Prewash procedures
- Addendum C : Ventilation procedures
- Addendum D : Additional information and operational instructions when required or accepted by the Administration.

SECTION 1 -- Main features of MARPOL 73/78, Annex II

1.1 The requirements of Annex II apply to all ships carrying noxious liquid substances in bulk. Substances posing a threat of harm to the marine environment are divided into four categories, A, B, C and D, and listed as such in appendix II to Annex II. Category A substances are those posing the greatest threat to the marine environment, whilst Category D substances are those posing the smallest threat.

1.2 Annex II prohibits the discharge into the sea of any effluent containing substances falling under these categories, except when the discharge is made under conditions which are specified in detail for each category. These conditions include, where applicable, such parameters as:

- .1 the maximum quantity of substances per tank which may be discharged into the sea;
- .2 the speed of the ship during the discharge;
- .3 the minimum distance from the nearest land during discharge;
- .4 the minimum depth of water at sea during discharge; and
- .5 the need to effect the discharge below the waterline.

1.3 For certain sea areas identified as “special areas” more stringent discharge criteria apply. Under Annex II the special areas are the Baltic Sea area, the Black Sea area, and the Antarctic area.

1.4 Annex II requires that every ship is provided with pumping and piping arrangements to ensure that each tank designated for the carriage of Category B and C substances does not retain after unloading a quantity of residue in excess of the quantity given in the Annex. For each tank intended for the carriage of such substances an assessment of the residue quantity has to be made. Only when the residue quantity as assessed is less than the quantity prescribed by the Annex a tank may be approved for the carriage of a Category B or a Category C substance.

1.5 In addition to the conditions referred to above, an important requirement contained in Annex II is that the discharge operations of certain cargo residues and certain tank cleaning and ventilation operations may only be carried out in accordance with approved procedures and arrangements.

1.6 To enable this requirement to be complied with, this Manual contains in section 2 all particulars of the ship's equipment and arrangements, in section 3 operational procedures for cargo unloading and tank stripping and in section 4 procedures for discharge of cargo residues, tank washing, slops collection, ballasting and deballasting as may be applicable to the substances the ship is certified to carry.

1.7 By following the procedures as set out in this Manual, it will be ensured that the ship complies with all relevant requirements of Annex II to MARPOL 73/78.

SECTION 2 - Description of the ship's equipment and arrangements

2.1 This section contains all particulars of the ship's equipment and arrangements necessary to enable the crew to follow the operational procedures set out in sections 3 and 4.

2.2 *General arrangement of ship and description of cargo tanks*

This section should contain a brief description of the cargo area of the ship with the main features of the cargo tanks and their positions.

Line or schematic drawings showing the general arrangement of the ship and indicating the position and numbering of the cargo tanks and heating arrangements should be included. Identification of the cargo tanks certified fit to carry noxious liquid substances should be made in conjunction with table 1 of this Manual.

2.3 *Description of cargo pumping and piping arrangements and stripping system*

This section should contain a description of the cargo pumping and piping arrangements and of the stripping system. Line or schematic drawings should be provided showing the following and be supported by textual explanation where necessary:

- .1 cargo piping arrangements with diameters;
- .2 cargo pumping arrangements with pump capacities;
- .3 piping arrangements of stripping system with diameters;
- .4 pumping arrangements of stripping system with pump capacities;
- .5 location of suction points of cargo lines and stripping lines inside every cargo tank;
- .6 if a suction well is fitted, the location and cubic capacity thereof;
- .7 line draining and stripping or blowing arrangements; and
- .8 quantity and pressure of nitrogen or air required for line blowing if applicable.

2.4 *Description of ballast tanks and ballast pumping and piping arrangements*

This section should contain a description of the ballast tanks and ballast pumping and piping arrangements.

Line or schematic drawings and tables should be provided showing the following:

- .1 a general arrangement showing the segregated ballast tanks and cargo tanks to be used as ballast tanks together with their capacities (cubic metres);
- .2 ballast piping arrangement;

- .3 pumping capacity for those cargo tanks which may also be used as ballast tanks; and
- .4 any interconnection between the ballast piping arrangements and the underwater outlet system.

2.5 *Description of dedicated slop tanks with associated pumping and piping arrangements*

This section should contain a description of the dedicated slop tank(s), if any, with the associated pumping and piping arrangements. Line or schematic drawings should be provided showing the following:

- .1 which dedicated slop tanks are provided together with the capacities of such tanks;
- .2 pumping and piping arrangements of dedicated slop tanks with piping diameters and their connection with the underwater discharge outlet.

2.6 *Description of underwater discharge outlet for effluents containing noxious liquid substances*

This section should contain information on position and maximum flow capacity of the underwater discharge outlet (or outlets) and the connections to this outlet from the cargo tanks and slop tanks. Line or schematic drawings should be provided showing the following:

- .1 location and number of underwater discharge outlets;
- .2 connections to underwater discharge outlet;
- .3 location of all seawater intakes in relation to underwater discharge outlets.

2.7 *Description of flow rate indicating and recording devices*

Deleted

2.8 *Description of cargo tank ventilation system*

Deleted. This section should contain a description of the cargo tank ventilation system.

Line or schematic drawings and tables should be provided showing the following and supported by textual explanation if necessary:

- .1 the noxious liquid substances the ship is certified fit to carry having a vapour pressure over 5 kPa at 20°C suitable for cleaning by ventilation to be listed in table 1;
- .2 ventilation piping and fans;
- .3 position of the ventilation openings;
- .4 the minimum flow rate of the ventilation system to adequately ventilate the bottom and all parts of the cargo tank;

- .5 the location of structures inside the tank affecting ventilation;
- .6 the method of ventilating the cargo pipeline system, pumps, filters, etc; and
- .7 means for ensuring that the tank is dry.

2.9 *Description of tank washing arrangements and washwater heating system*

This section should contain a description of the cargo tank washing arrangements, washwater heating system and all necessary tank washing equipment.

Line or schematic drawings and tables or charts showing the following:

- .1 arrangements of piping dedicated for tank washing with pipeline diameters;
- .2 type of tank washing machines with capacities and pressure rating;
- .3 maximum number of tank washing machines which can operate simultaneously;
- .4 position of deck openings for cargo tank washing;
- .5 the number of washing machines and their location required for ensuring complete coverage of the cargo tank walls;
- .6 maximum capacity of wash water which can be heated to 60°C by the installed heating equipment; and
- .7 maximum number of tank washing machines which can be operated simultaneously at 60°C.

SECTION 3 - Cargo unloading procedures and tank stripping

3.1 This section contains operational procedures in respect of cargo unloading and tank stripping which must be followed in order to ensure compliance with the requirements of Annex II.

3.2 *Cargo unloading*

This section should contain procedures to be followed including the pump and cargo unloading and suction line to be used for each tank. Alternative methods may be given.

The method of operation of the pump or pumps and the sequence of operation of all valves should be given.

The basic requirement is to unload the cargo to the maximum practicable extent.

3.3 *Cargo tank stripping*

This section should contain procedures to be followed during the stripping of each cargo tank.

The procedures should include the following:

- .1 operation of stripping system;
- .2 list and trim requirements;
- .3 line draining and stripping or blowing arrangements if applicable.

3.4 *Cargo temperature*

This section should contain information on the heating requirements of cargoes which have been identified as being required to be at a certain minimum temperature during unloading.

Information should be given on control of the heating system and the method of temperature measurement.

3.5 *Procedures to be followed when a cargo tank cannot be unloaded in accordance with the required procedures*

This section should contain information on the procedures to be followed in the event that the requirements contained in sections 3.3 and/or 3.4 cannot be met due to circumstances such as the following:

- .1 failure of cargo tank stripping system; and
- .2 failure of cargo tank heating system.

3.6 *Cargo Record Book*

The Cargo Record Book should be completed in the appropriate places on completion of cargo unloading.

SECTION 4 *Procedures relating to the cleaning of cargo tanks, the discharge of residues, ballasting and deballasting*

4.1 This section contains operational procedures in respect of tank cleaning, ballast and slops handling which must be followed in order to ensure compliance with the requirements of Annex II.

4.2 The following paragraphs outline the sequence of actions to be taken and contain the information essential to ensure that noxious liquid substances are discharged without posing a threat of harm to the marine environment.

4.3 Establish if the last cargo in the tank is included in the ship's approved list of noxious liquid substances (see table 1). If not included, no special tank cleaning, residue discharge, ballasting and deballasting procedures apply under the provisions of Annex II.

4.4 If the last cargo in the tank is included in the above-mentioned list, the information necessary to establish the procedures for discharging the residue of that cargo, cleaning, ballasting and deballasting the tank, should take into account the following:

.1 *Category of substance*

Obtain the category of the substance from table 1.

.2 *Stripping efficiency of tank pumping system*

The contents of this section will depend on the design of the ship and whether it is a new ship or existing ship. (See flow diagrams pumping/ stripping requirements.)

.3 *Vessel within or outside special area*

This section should contain instructions on whether the tank washings can be discharged into the sea within a special area (as defined in section 1.3) or outside a special area. The different requirements should be made clear and will depend on the design and trade of the ship.

.4 *Solidifying or high-viscosity substance*

The properties of the substance should be obtained from the shipping document.

.5 *Miscibility with water* Deleted

.6 *Compatibility with slops containing other substances*

This section should contain instructions on the permissible and non-permissible mixing of cargo slops. Reference should be made to compatibility guides.

.7 *Discharge to reception facility*

This section should identify those substances the residues of which are required to be prewashed and discharged to a reception facility.

.8 *Discharging into the sea*

This section should contain information on the factors to be considered in order to identify whether the residue/water mixtures are permitted to be discharged into the sea.

.9 *Use of cleaning agents or additives* *

This section should contain information on the use and disposal of cleaning agents (e.g. solvents used for tank cleaning) and additives to tank washing water (e.g. detergents).

.10 *Use of ventilation procedures for tank cleaning*

This section should make reference to table 1 to ascertain the suitability of the use of ventilation procedures.

* See the latest edition of MEPC.2/Circular, Annex 12 (issued annually in December)
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4.5 Having assessed the above information, the correct operational procedures to be followed should be identified using the instructions and flow diagrams in this section. Appropriate entries should be made in the Cargo Record Book indicating the procedure adopted.

This section should contain procedures, which will depend on the age of the ship and pumping efficiency. Examples of flow diagrams referred to in this section are given at addendum A and incorporate comprehensive requirements applicable to both new and existing ships. The Manual for a particular ship should only contain those requirements specifically applicable to that ship. The Manual should contain the following information and procedures:

- Table 1 : List of noxious liquid substances allowed to be carried.
- Table 2 : Cargo tank information.
- Addendum A : Flow diagrams.
- Addendum B : Prewash procedures.
- Addendum C : Ventilation procedures.
- [Addendum D: Additional information and operational instruction when required or accepted by the Administration.]

Outlines of the above tables and addenda follow.

Table 1 - List of noxious liquid substances allowed to be carried

Substance	Category	Tanks (tank groups)* fit for carriage	Melting point °C	Viscosity at 20°C mPa.s			Suitable for ventilation Yes/No
				<25	25-60	>60	

Note: Information need only be inserted in the fourth and fifth columns, relating to melting point and viscosity, for those substances which have a melting point greater than 0C or a viscosity greater than 25 mPa.s at 20°C. When more than one commercial grade is shipped and the viscosities or the melting points of those commercial grades differ, enter and note that other commercial grades may have lower viscosities or melting points or give the values for each commercial grade which will be shipped.

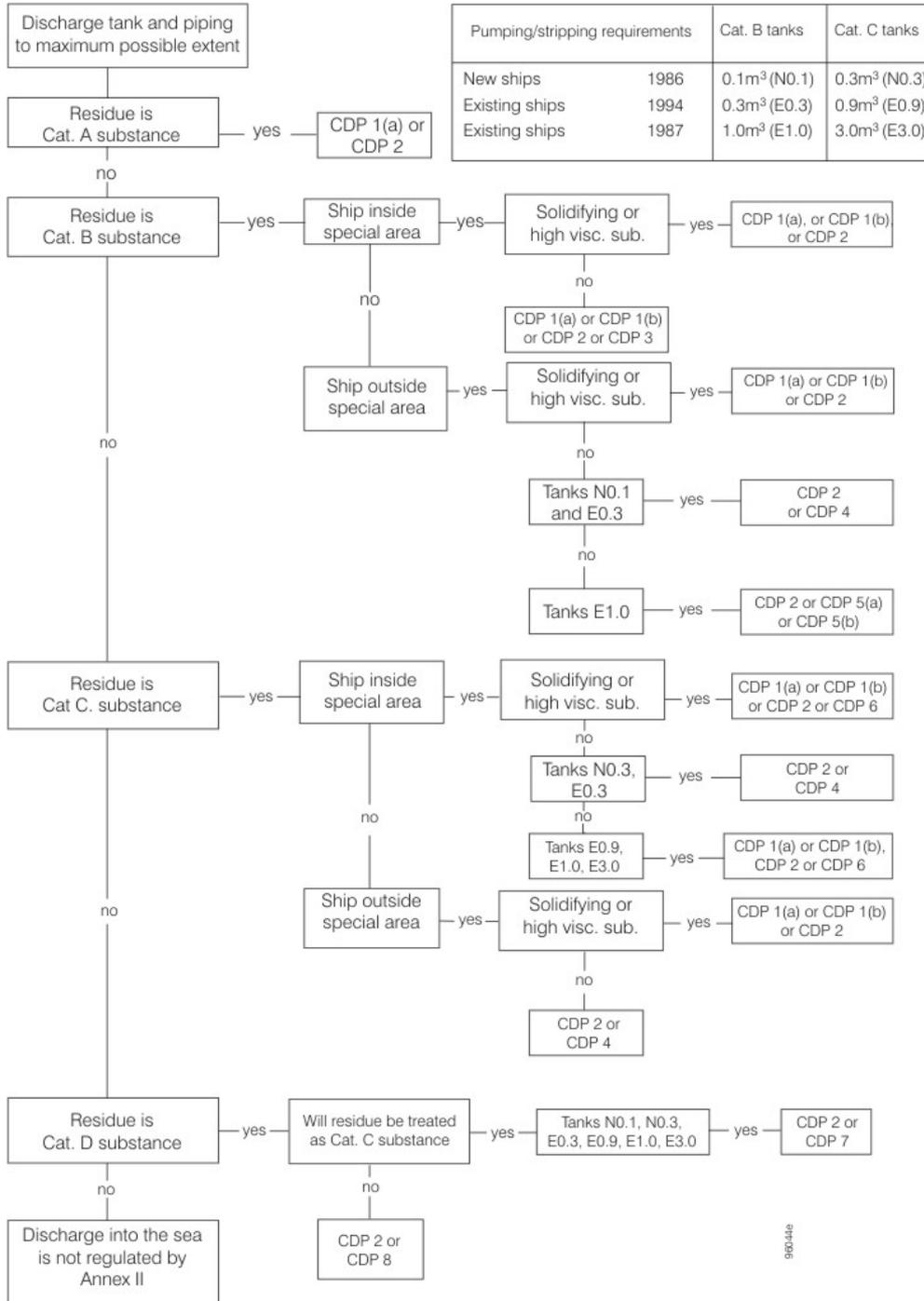
* Tank numbers (tank groups) should be identical to those in the ship's Certificate of Fitness.

Table 2 - Cargo tank information

Tank no.	Capacity (m ³)	Stripping quantity (litres)	Approved stripping level under reg. 13

ADDENDUM A

Flow diagrams -- Cleaning of cargo tanks and disposal of tank washings/ballast containing residues of Category A, B, C and D substances

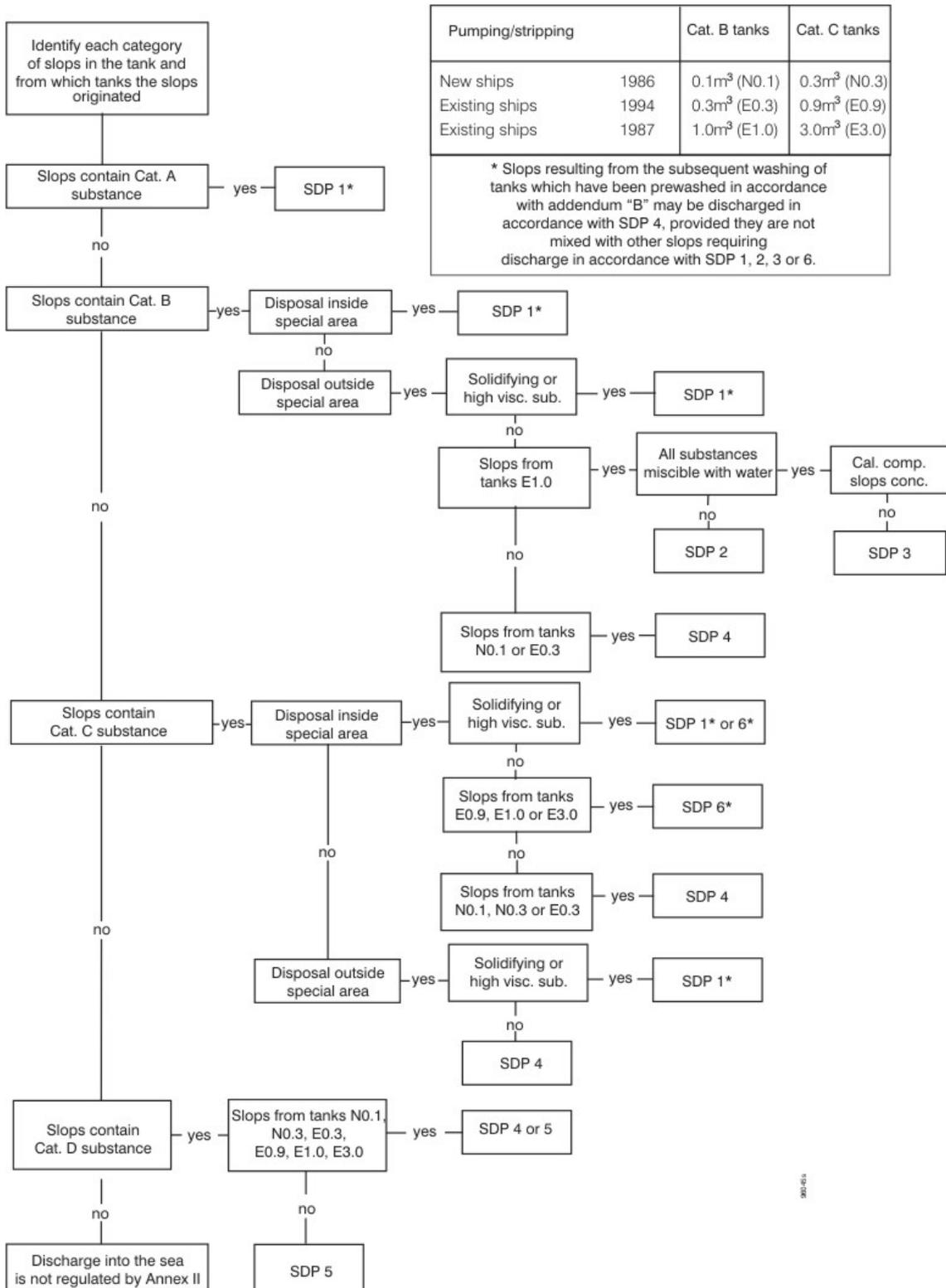


Note: This is a flow diagram giving comprehensive requirements applicable to new and existing ships. The flow diagram for a specific ship should only include parts applicable to that ship.

Cleaning and disposal procedures (CDP)	Sequence of procedures									
	1(a)	1(b)	2	3	4	5(a)	5(b)	6	7	8
Apply prewash in accordance with appendix B and discharge residue to reception facility	X	X								
Apply prewash in accordance with appendix B and transfer residues to slop tank for discharge to sea in accordance with chapter 10, section 10.5 or 10.6						X	X			
Apply subsequent wash of minimum one cycle		X					X			
Apply ventilation procedures in accordance with appendix C			X							
Residue may be retained on board and discharged outside special area				X						
Residues of substances with viscosities <60 mPa.s at the unloading temperature may be retained on board and discharged outside special area. Alternatively, tanks may be prewashed and slops discharged ashore								X		
Dilute residue in cargo tanks with water to obtain residue concentrations in mixture of 10% or less										X
Ballast tank or wash tank to commercial requirements	X			X	X	X		X	X	
Conditions for discharge of ballast/residue/water mixtures other than prewash:										
>12 miles from land	X	X		X	X	X	X	X	X	X
>7 knots ship's speed	X	X		X	X	X	X	X	X	X
>25 metres water depth	X	X		X	X	X	X	X		
Using underwater discharge	X	X		X	X	X	X	X	X	
Ballast added to tank		X					X			
Conditions for discharge of ballasts:										
>12 miles from land		X					X			
>25 metres water depth		X					X			
Alternatively, residue/water mixtures may be discharged ashore (N.B. optional not a MARPOL requirement)	X	X		X	X	X	X	X	X	X
Any water subsequently introduced into the tank may be discharged into the sea without restrictions	X	X	X	X	X	X	X	X	X	X

Note: Start at the top of the column under the CDP number specified and complete each procedure in sequence where marked x.

Disposal of prewash or tank washings containing Category A, B, C or D substances from dedicated slop tanks or cargo tanks containing tank washings or slops



Pumping/stripping		Cat. B tanks	Cat. C tanks
New ships	1986	0.1m ³ (N0.1)	0.3m ³ (N0.3)
Existing ships	1994	0.3m ³ (E0.3)	0.9m ³ (E0.9)
Existing ships	1987	1.0m ³ (E1.0)	3.0m ³ (E3.0)

* Slops resulting from the subsequent washing of tanks which have been prewashed in accordance with addendum "B" may be discharged in accordance with SDP 4, provided they are not mixed with other slops requiring discharge in accordance with SDP 1, 2, 3 or 6.

Note: This is a flow diagram giving comprehensive requirements applicable to new and existing ships. The flow diagram for a specific ship should only include parts applicable to that ship.

Slops disposal procedures (SDP)	Sequence of procedures					
	1	2	3	4	5	6
Slops must be discharged ashore	X					
Establish discharge rate of miscible residue/water mixture in accordance with addendum D		X				
Divide obtained discharge rate of pure product by composite slops concentration			X			
The figure obtained shows the rate at which discharge is permitted		X	X			
Residues of substances with viscosities <50 mPa.s at the unloading temperature may be retained on board and discharged outside special area. Alternatively, tanks may be prewashed and slops discharged ashore.						X
Dilute slops with water to obtain a solution of 10% or less. No restrictions on discharge rate.					X	
Discharge rate is maximum permitted by underwater discharge outlet				X		X
Additional discharge conditions: ship's speed at least 7 knots outside 12 miles from nearest land depth of water at least 25 metres using underwater discharge		X	X	X	X	X
		X	X	X	X	X
		X	X	X	X	X
		X	X	X	X	X

Note: Start at the top of the column under the SDP number specified and complete each procedure in sequence where marked x.

ADDENDUM B - Prewash procedures

This addendum to the Manual should contain prewash procedures based on appendix VI of Annex II. These procedures should contain specific requirements for the use of the tank washing arrangements and equipment provided on the particular ship and include the following:

- .1 washing machine positions to be used;
- .2 slops pumping out procedure;
- .3 requirements for hot washing;
- .4 number of cycles of washing machine (or time);
- .5 minimum operating pressures.

ADDENDUM C -- Ventilation procedures

This addendum to the Manual should contain ventilation procedures based on appendix VII of Annex II. The procedures should contain specific requirements for the use of the cargo tank ventilation system, or equipment, fitted on the particular ship and should include the following:

- .1 ventilation positions to be used;
- .2 minimum flow or speed of fans;
- .3 procedures for ventilating cargo pipeline, pumps, filters, etc.;
- .4 procedures for ensuring that tanks are dry on completion.

Appendix V

Assessment of Residue Quantities in Cargo tanks, Pumps and associated Piping

1 Introduction

1.1 Purpose

1.1.1 The purpose of this appendix is to provide the procedure for testing the efficiency of cargo pumping systems.

1.2 Background

1.2.1 The ability of the pumping system of a tank to comply with regulation 13.1, 13.2 or 13.3 is determined by performing a test in accordance with the procedure set out in section 3 of this appendix. The quantity measured is termed the "stripping quantity". The stripping quantity of each tank shall be recorded in the ship's Manual.

1.2.2 After having determined the stripping quantity of one tank, the Administration may use the determined quantities for a similar tank, provided the Administration is satisfied that the pumping system in that tank is similar and operating properly.

2 Design criteria and performance test

2.1 The cargo pumping systems should be designed to meet the required maximum amount of residue per tank of for Category B or C substances as specified in regulation 13 to the satisfaction of the Administration.

2.2 In accordance with regulation 13.4, the cargo pumping systems should be tested with water to prove their performance. Such water tests should, by measurement, show that the system meets the requirements of regulation 13. In respect of regulations 13.1 and 13.2 a tolerance of 50 l per tank is acceptable.

3 Water test procedure

3.1 Test condition

3.1.1 The ship's trim and list should be such as to provide favourable drainage to the suction point. During the water test the ship's trim should not exceed 3° by the stern, and the ship's list should not exceed 1°.

3.1.2 The trim and list chosen for the water test should be the minimum favourable trim and list as given in the ship's Manual for the stripping of the cargo tanks.

3.1.3 During the water test means should be provided to maintain a back-pressure of not less than 100 KPa at the cargo tank's unloading manifold (see figures A-1 and A-2).

3.2 Test procedure

3.2.1 Ensure that the cargo tank to be tested and its associated piping have been cleaned and that the cargo tank is safe for entry.

3.2.2 Fill the cargo tank with water to a depth necessary to carry out normal end of unloading procedures.

3.2.3 Pump and strip the cargo tank and its associated piping in accordance with the ship's approved Manual.

3.2.4 Collect all water remaining in the cargo tank and its associated piping into a calibrated container for measurement. Water residues should be collected, inter alia, from the following points:

- .1 the cargo tank suction and its vicinity;
- .2 any entrapped areas on the cargo tank bottom;
- .3 the low point drain of the cargo pump; and
- .4 all low point drains of piping associated with the cargo tank up to the manifold valve.

3.2.5 The total water volumes collected above determine the stripping quantity for the cargo tank.

3.2.6 Where a group of tanks is served by a common pump or piping, the water test residues associated with the common system(s) may be apportioned equally among the tanks provided that the following operational restriction is included in the ship's approved Manual: "For sequential unloading of tanks in this group, the pump or piping is not to be washed until all tanks in the group have been unloaded."

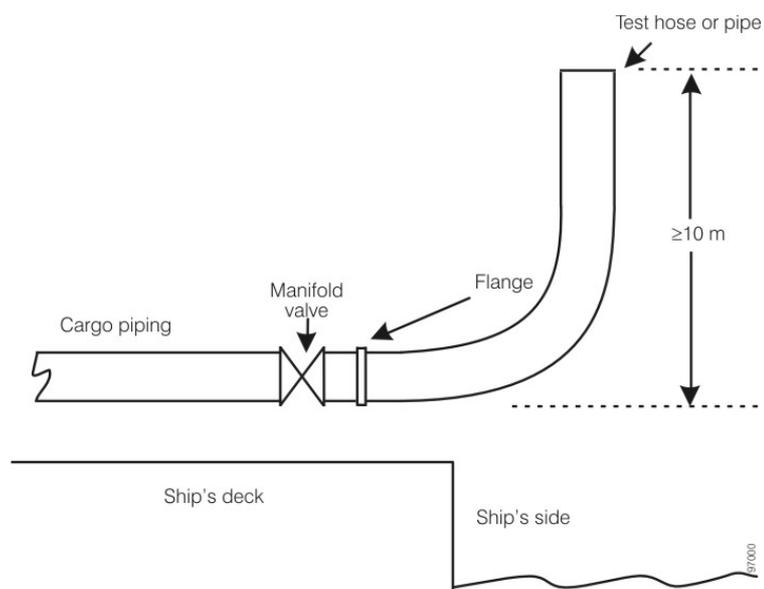


Figure A-1

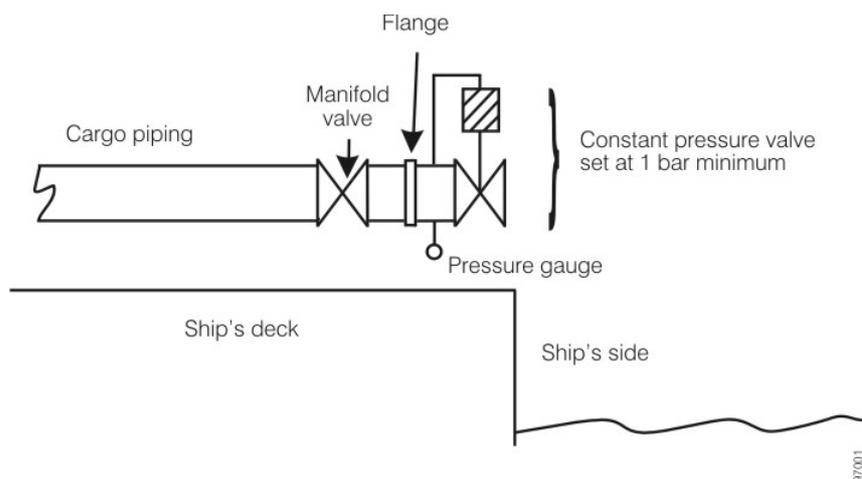


Figure A-2

The above figures illustrate test arrangements that would provide a backpressure of not less than 100 kPa at the cargo tank's unloading manifold.

4 Calculation of clingage residues

4.1 Calculate the clingage residues using the following formula:

$$Q_{\text{RES}}^{(\text{surf})} = 1.1 \times 10^{-4} A_d + 1.5 \times 10^{-5} A_w + 4.5 \times 10^{-4} L^{1/2} A_b$$

4.2 Symbols and units used in the residue equation:

A_b = Area of tank bottom and horizontal components of tank structural members facing upwards (m^2)

A_d = Area underdecks and horizontal components of tank structural members facing downwards (m^2)

A_w = Surface area of tank walls and vertical components of tank structural members (m^2)

L = Length of tank (m)

$Q_{\text{RES}}^{(\text{surf})}$ = Amount of clingage residue on tank surfaces (m^3)

Note 1: For purposes of calculating A_b , A_d and A_w , inclined (greater than 30° from the horizontal) and curved surfaces should be treated as vertical.

Note 2: Methods of approximating A_b , A_d and A_w are permissible. A method presented in BCH 15/INF.5 by Japan is an example.

APPENDIX VI

Prewash Procedures

A For ships built before 1 July 1994

A prewash procedure is required in order to meet certain Annex II requirements. This appendix explains how these prewash procedures should be performed.

Prewash procedures for non-solidifying substances

1 Tanks should be washed by means of a rotary water jet, operated at sufficiently high water pressure. In the case of Category A substances washing machines should be operated in such locations that all tank surfaces are washed. In the case of Category B and C substances only one location need be used.

2 During washing the amount of water in the tank should be minimized by continuously pumping out slops and promoting flow to the suction point (positive list and trim). If this condition cannot be met the washing procedure should be repeated three times, with thorough stripping of the tank between washings.

3 Those substances which have a viscosity equal to or greater than 50 mPa.s at 20°C should be washed with hot water (temperature at least 60°C), unless the properties of such substances make the washing less effective.

4 The number of cycles of the washing machine used should not be less than that specified in table B-1. A washing machine cycle is defined as the period between two consecutive identical orientations of the washing machine (rotation through 360°).

5 After washing, the washing machine(s) should be kept operating long enough to flush the pipeline, pump and filter.

Prewash procedures for solidifying substances

1 Tanks should be washed as soon as possible after unloading. If possible tanks should be heated prior to washing.

2 Residues in hatches and manholes should preferably be removed prior to the prewash.

3 Tanks should be washed by means of a rotary water jet operated at sufficiently high water pressure and in locations to ensure that all tank surfaces are washed.

4 During washing the amount of water in the tank should be minimized by pumping out slops continuously and promoting flow to the suction point (positive list and trim). If this condition cannot be met, the washing procedure should be repeated three times with thorough stripping of the tank between washings.

5 Tanks should be washed with hot water (temperature at least 60°C), unless the properties of the substance makes the washing less effective.

6 The number of cycles of the washing machine used should not be less than that specified in table B-1. A washing machine cycle is defined as the period between two consecutive identical orientations of the machine (rotation through 360°).

7 After washing, the washing machine(s) should be kept operating long enough to flush the pipeline, pump and filter.

Table B-1 -- Number of washing machine cycles to be used in each location

Category of substance	Number of washing machine cycles	
	Non-solidifying substances	Solidifying substances
Category A (residual concentration 0.1% or 0.05%)	1	2
Category B	1/2	1
Category C	1/2	1

Note: For an explanation of “residual concentration” see regulation 14.7.1 and 14.11.1 of Annex II.

B For ships built on or after 1 July 1994 and recommendatory for ships built before 1 July 1994

A prewash procedure is required in order to meet certain Annex II requirements. This appendix explains how these prewash procedures should be performed and how the minimum volumes of washing media to be used should be determined. Smaller volumes of washing media may be used based on actual verification testing to the satisfaction of the Administration. Where reduced volumes are approved an entry to that effect must be recorded in the Manual.

If a medium other than water is used for the prewash, the provisions of regulation 14.5.1 apply.

Prewash procedures for non-solidifying substances without recycling

1 Tanks should be washed by means of a rotary jet(s), operated at sufficiently high water pressure. In the case of Category A substances washing machines should be operated in such locations that all tank surfaces are washed. In the case of Category B and C substances only one location need be used.

2 During washing the amount of liquid in the tank should be minimized by continuously pumping out slops and promoting flow to the suction point. If this condition cannot be met, the washing procedure should be repeated three times, with thorough stripping of the tank between washings.

3 Those substances which have a viscosity equal to or greater than 50 mPa.s at 20°C should be washed with hot water (temperature at least 60°C), unless the properties of such substances make the washing less effective.

4 The quantities of wash water used should not be less than those specified in paragraph 20 or determined according to paragraph 21.

5 After prewashing the tanks and lines should be thoroughly stripped.

Prewash procedures for solidifying substances without recycling.

6 Tanks should be washed as soon as possible after unloading. If possible, tanks should be heated prior to washing.

7 Residues in hatches and manholes should preferably be removed prior to the prewash.

8 Tanks should be washed by means of a rotary jet(s) operated at sufficiently high water pressure and in locations to ensure that all tank surfaces are washed.

9 During washing the amount of liquid in the tank should be minimized by pumping out slops continuously and promoting flow to the suction point. If this condition cannot be met, the washing procedure should be repeated three times with thorough stripping of the tank between washings.

10 Tanks should be washed with hot water (temperature at least 60°C), unless the properties of such substances make the washing less effective.

11 The quantities of wash water used should not be less than those specified in paragraph 20 or determined according to paragraph 21.

12 After prewashing the tanks and lines should be thoroughly stripped.

Prewash procedures with recycling of washing medium

13 Washing with a recycled washing medium may be adopted for the purpose of washing more than one cargo tank. In determining the quantity, due regard must be given to the expected amount of residues in the tanks and the properties of the washing medium and whether any initial rinse or flushing is employed. Unless sufficient data are provided, the calculated end concentration of cargo residues in the washing medium should not exceed 5% based on nominal stripping quantities.

14 The recycled washing medium should only be used for washing tanks having contained the same or similar substance.

15 A quantity of washing medium sufficient to allow continuous washing should be added to the tank or tanks to be washed.

16 All tank surfaces should be washed by means of a rotary jet(s) operated at sufficiently high pressure. The recycling of the washing medium may either be within the tank to be washed or via another tank, e.g. a slop tank.

17 The washing should be continued until the accumulated throughput is not less than that corresponding to the relevant quantities given in paragraph 20 or determined according to paragraph 21.

18 Solidifying substances and substances with viscosity equal to or greater than 50 mPa.s at 20°C should be washed with hot water (temperature at least 60°C) when water is used as the washing medium, unless the properties of such substances make the washing less effective.

19 After completing the tank washing with recycling to the extent specified in paragraph 17, the washing medium should be discharged and the tank thoroughly stripped. Thereafter, the tank should be subjected to a rinse, using clean washing medium, with continuous drainage and discharge. The rinse should as a minimum cover the tank bottom and be sufficient to flush the pipelines, pump and filter.

Minimum quantity of water to be used in a prewash

20 The minimum quantity of water to be used in a prewash is determined by the residual quantity of noxious liquid substance in the tank, the tank size, the cargo properties, the permitted concentration in any subsequent wash water effluent, and the area of operation. The minimum quantity is given by the following formula:

$$Q=k(15r^{0.8} + 5r^{0.7} \times V/1000)$$

where

Q = the required minimum quantity in m³

r = the residual quantity per tank in m³. The value of r shall be the value demonstrated in the actual stripping efficiency test, but should not be taken lower than 0.100 m³ for a tank volume of 500 m³ and above and 0.040 m³ for a tank volume of 100 m³ and below. For tank sizes between 100 m³ and 500 m³ the minimum value of r allowed to be used in the calculations is obtained by linear interpolation.

For Category A substances the value of r should either be determined based on stripping tests according to Appendix V of Annex II, observing the lower limits as given above, or be taken to be 0.9 m³.

V = tank volume in m³

k = a factor having values as follows:

Category A, non-solidifying, low-viscosity substance, outside special areas	k = 1.0
Category A, non-solidifying, low-viscosity substance, inside special areas	k = 1.2
Category A, solidifying or high-viscosity substance, outside special areas	k = 2.0
Category A, solidifying or high-viscosity substance, inside special areas	k = 2.4
Category B and C, non-solidifying, low-viscosity substance	k = 0.5
Category B and C, solidifying or high-viscosity substance	k = 1.0

The table below is calculated using the formula with a k factor of 1 and may be used as an easy reference.

Stripping quantity (m ³)	Tank volume (m ³)		
	100	500	3000
≤0.04	1.2	2.9	5.4
.10	2.5	2.9	5.4
.30	5.9	6.8	12.2
.90	14.3	16.1	27.7

21 Verification testing for approval of prewash volumes lower than those given in paragraph 20 may be carried out to the satisfaction of the Administration to prove that the objectives of regulation 14.7 are met, taking into account the substances the ship is certified to carry. The prewash volume so verified should be adjusted for other prewash conditions by application of the factor k as defined in paragraph 20.

APPENDIX VII

Ventilation Procedures

- 1 Cargo residues of substances with a vapour pressure greater than 5 KPa at 20°C may be removed from a cargo tank by ventilation.
- 2 Before residues of noxious liquid substances are ventilated from a tank the safety hazards relating to cargo flammability and toxicity should be considered. With regard to safety aspects, the operational requirements for openings in cargo tanks in SOLAS 74, the International Bulk Chemical Code, the Bulk Chemical Code, and the ventilation procedures in the International Chamber of Shipping (ICS) Tanker Safety Guide (Chemicals) should be consulted.
- 3 Port authorities may also have regulations on cargo tank ventilation.
- 4 The procedures for ventilation of cargo residues from a tank are as follows:
 - .1 the pipelines should be drained and further cleared of liquid by means of ventilation equipment;
 - .2 the list and trim should be adjusted to the minimum levels possible so that evaporation of residues in the tank is enhanced;
 - .3 ventilation equipment producing an airjet which can reach the tank bottom shall be used. Figure C-1 could be used to evaluate the adequacy of ventilation equipment used for ventilating a tank of a given depth;
 - .4 ventilation equipment should be placed in the tank opening closest to the tank sump or suction point;
 - .5 ventilation equipment should, when practicable, be positioned so that the airjet is directed at the tank sump or suction point and impingement of the airjet on tank structural members is to be avoided as much as possible; and
 - .6 ventilation shall continue until no visible remains of liquid can be observed in the tank. This shall be verified by a visual examination or an equivalent method.

[Insert figure C01 from page 343]

Figure C-1. Minimum flow rate as a function of jet penetration depth. Jet penetration depth should be compared against tank height.