



RULES FOR CLASSIFICATION OF **SHIPS**

NEWBUILDINGS

SPECIAL EQUIPMENT AND SYSTEMS
ADDITIONAL CLASS

PART 6 CHAPTER 12

ENVIRONMENTAL CLASS

JULY 2008

*This booklet includes the relevant amendments and corrections
shown in the July 2009 version of Pt.0 Ch.1 Sec.3.*

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CHANGES IN THE RULES

General

The present edition of the rules includes amendments and additions approved by the Board as of June 2008 and supersedes the July 2005 edition of the same chapter.

The rule changes come into force as described below.

This chapter is valid until superseded by a revised chapter. Supplements will not be issued except for an updated list of corrections presented in Pt.0 Ch.1 Sec.3. Pt.0 Ch.1 is normally revised in January and July each year.

Revised chapters will be forwarded to all subscribers to the rules. Buyers of reprints are advised to check the updated list of rule chapters printed in Pt.0 Ch.1 Sec.1 to ensure that the chapter is current.

Main changes adopted July 2009

Coming into force 1 July 2009

- **General**

- Throughout the chapter, the wording "IACS member society" has been changed to "recognized classification society".

Main changes coming into force 1 January 2009

- **Sec.1 General Requirements**

- Tables C1, C2 and C3 have been replaced in their entirety.

- **Sec.2 Class Notation Clean**

- Item B202 has been rewritten for better understanding.
- Sub-section element B300 has been revised, also including some of the previous items in sub-section element B200.
- Sub-section element B400 has been revised. Among others: in item B401 a Guidance note have been added, and item B408 has been rewritten concerning the leak detection systems.
- In item C402, additional requirements have been added.
- Sub-section element C800 has been completely rewritten and clarified.
- Sub-section D has been amended, including management's responsibility for procedures.

- **Sec.3 Class Notation Clean Design**

- Sub-section element B300 has been replaced with new requirements, also including some of the previous items in sub-section element B200.
- In item C102, a new requirement has been added for vessels < 5 000 tonnes.
- Item C604 has been deleted.
- Item C702 has been amended, with a capacity to incinerate 100% onboard.
- Item C803 has been clarified.
- Sub-section element D100 has been amended with regard to applicability and requirements.
- Item D301 has been amended, incorporating class notation **EP**.

Corrections and Clarifications

In addition to the above stated rule requirements, a number of corrections and clarifications have been made to the existing rule text.

Comments to the rules may be sent by e-mail to rules@dnv.com

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SECTION 1 GENERAL REQUIREMENTS

A. Classification

A 100 Application

101 The rules in this chapter state requirements for design and equipment reducing the environmental impact from emissions to air, discharges to sea, and deliveries to shore from ships. The requirements are in compliance with or more extensive than those found in international standards currently in force. Ships complying with the requirements in this chapter may be given the additional class notations:

CLEAN or

CLEAN DESIGN.

102 The rules aim at attaining a ship with controlled environmental standards of design and performance. Compliance with the rules shall be verified through inspection, measurements and sampling of defined environmental parameters in accordance with the requirements of the rules in this chapter and in compliance with identified standards and guidelines.

103 Effects and parameters covered are described in B100 by reference to technical standards and installations, and their operation.

104 Environmental management systems, e.g. ISO 14000, are not part of the rules. Fulfilment of the requirements in the rules may, however, facilitate goals and improvement tasks defined through ISO 14000 implementation.

105 Special ship types and ships with propulsion machinery systems listed in Table A1, will be subject to special consideration addressing specific items not covered by the standard rules. Tankers for oil smaller than 150 GT and other ships smaller than 400 GT will also be subject to special consideration.

Table A1 Ship types and propulsion machinery systems that will be especially considered
<i>Ship types</i>
Liquefied gas carriers
Floating storage, production and offloading systems
<i>Propulsion machinery systems</i>
Gas turbines
Steam turbines
Combined systems

106 Ships with class notations covered by this chapter shall comply with the requirements specified in Table A2.

Table A2 Requirements for ships with class notations **CLEAN or **CLEAN DESIGN****

<i>Subject</i>	<i>Class notation</i>	
	CLEAN	CLEAN DESIGN
Ships ¹⁾ shall be enrolled in an emergency response scheme administered by the Society, or another recognized classification society	Yes	Yes
Ships shall hold Class Notation E0 , or ECO , see Ch.3	Yes	Yes
Ships shall hold class notation, NAUT-AW , see Ch.8. or NAUT-OSV(A) , see Ch.20	Not required	Yes
Ships shall be arranged and equipped with additional oil pollution prevention measures as defined for the notation, OPP-F , see Ch.1 Sec.6	Yes	Yes
¹⁾ Dry cargo ship less than 3 000 GT and ships with class notation Supply Vessel and SF do not need to meet this requirement.		

A 200 Class notations

201 The class notation **CLEAN** identifies the basic requirements for controlling and limiting operational emissions and discharges. The requirements are specified in Sec.2.

202 The class notation **CLEAN DESIGN** identifies additional requirements for controlling and limiting operational emissions and discharges. In addition, this notation specifies design requirements for protection against accidents and for limiting their consequences. The requirements are specified in Sec.3.

B. Definitions

B 100 Definition, main parameters

101 Emissions to air

All emissions to air which are caused by or needed for the operation of the ship, energy consumers, cargo, passengers, and crew on board a vessel, and any toxic emissions caused by operation, protection and conservation of vessel or cargo.

102 Discharges to sea

All discharges to sea which are caused by or needed for operation of the ship, energy consumers, cargo, passengers, and crew on board a vessel, and any toxic discharges caused by protection and conservation of vessel or cargo.

103 Deliveries to shore

Delivery of potential pollutants to shore.

104 Port

The ship is considered in port from ordering "stand by" prior to entering port to ordering "full ahead" when leaving the port. The time will be confirmed by entries in the ship's logbook.

105 SO_x- emission control area

SO_x- emission control areas are defined in MARPOL Annex VI and in the EU Sulphur Directive 99/32/EC with proposed amendments.

B 200 Definitions and characteristics, systems and components

201 Ballast water system

Ballast water systems comprise:

- tanks for ballast water
- associated piping and pumping systems.

Environmental effects from ballast water covered by the rules in this chapter include transport and discharge of harmful aquatic organisms and pathogens.

202 Bilge water

Bilge water means water which may be contaminated by oil resulting from leakage or maintenance work in machinery spaces. Oily bilge water is initially collected in the bilge wells or tank top of machinery spaces. Any liquid entering the bilge system including bilge wells, bilge piping, tank top or bilge holding tanks is considered oily bilge water.

203 Cargo handling systems

Cargo handling systems covered by the rules in this chapter comprise:

- Cargo tank vents for tankers with cargoes where evaporation may occur during loading, transport and discharge. (e.g.: **Tanker for Oil, Tanker for Chemicals, Tanker for Liquefied Gas**)
- Pumping and piping systems for tankers carrying cargoes that may cause global or local pollution.

204 Residues of cargo oil and chemicals

Residues of cargo oil and chemicals means remains of cargo (oil or chemical contaminated water from cargo tank area, slop tanks and cargo pump room). Such residues may be present in discharged water used for cleaning cargo tanks, and discharged ballast water from tankers.

205 Combustion machinery

Combustion machinery comprises:

- internal combustion engines, both marine diesel engines and gas turbines
- boilers.

The rules in this chapter cover the emission to the atmosphere of oxides of nitrogen (NO_x) and -sulphur (SO_x) found in combustion machinery exhaust gases.

206 Fire-fighting system

The rules in this chapter cover the active fire-fighting media used in fixed fire-fighting systems.

207 Garbage

Garbage includes all kinds of victual, domestic and operational waste excluding fresh fish and parts thereof, generated during normal operation of the ship and liable to be disposed of continuously or periodically except those substances excluded specifically. Cargo residues from dry cargo ships are considered as garbage.

Systems for garbage handling include the following:

- garbage sorting systems, typically: glass, paper and metals
- compacting systems
- storage systems
- incinerators.

Sewage and waste oils are defined separately and not as garbage.

208 Painting and antifouling systems

Antifouling paint of the underwater area gives a continuous release of active ingredients to the sea. This effect is covered by the rules in this chapter.

In addition, painting and antifouling systems emit volatile organic compounds (VOC) during application. This effect is not considered by the rules in this chapter.

209 Refrigeration systems

The rules in this chapter cover refrigerant media used in cargo refrigeration plants, air conditioning and refrigeration systems onboard all ships.

Refrigerants may escape to atmosphere through refrigeration system leakage, service work and dismantling at the end of the system's working life.

210 Sewage

Sewage means:

- drainage and other wastes from all toilets and urinals
- drainage from medical premises (dispensary, sick bay) via wash basins, wash tubs and scuppers located in such rooms
- drainage from spaces containing living animals, or
- other waste waters when mixed with any of the drainage systems defined above.

211 Waste oil

Waste oils means:

- used lubrication and hydraulic oils
- oil leaked from lubrication and hydraulic oil systems
- leakage from fuel oil systems
- sludge from fuel and lubrication oil treatment systems (separators, filters).

Waste oils may be dealt with onboard, or pumped ashore. Cargo oil residues in slop tanks, see 204, are considered separate from operational waste oils.

212 NO_x-abatement technology

NO_x-abatement technology means a system for the purpose of reducing NO_x emissions to air.

213 SO_x-abatement technology

SO_x-abatement technology means an exhaust gas cleaning system for the purpose of removing SO_x from the exhaust.

B 300 Abbreviations

BCH Code:	Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (Bulk Chemical Code)
CFC:	Common name for refrigerants, including, but not limited to: CFC-11 (Trichlorofluoromethane), CFC-12 (Dichlorofluoromethane), etc.
CFR:	Code of Federal Regulations
GWP:	Global warming potential. (CO ₂ = 1, time horizon 100 years)
HCFC:	Hydrochlorofluorocarbons
HFC:	Hydrofluorocarbons
IACS:	International Association of Classification Societies.
IAPP Certificate:	International Air Pollution Prevention Certificate
IBC Code:	The International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk
IOPP Certificate:	International Oil Pollution Prevention Certificate
ISO:	International Organisation for Standardisation
IMO:	International Maritime Organisation
MARPOL or MARPOL 73/78:	The International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 thereto

MSC:	Maritime Safety Committee (IMO)
MEPC:	Maritime Environmental Protection Committee (IMO)
NO _x :	Oxides of nitrogen
ODP:	Ozone depleting potential. (Compared to CFC 11)
SCR:	Selective Catalytic Reduction.
SO _x :	Oxides of sulphur
TBT:	Tributyltin (active ingredient in antifouling paint)
TEWI:	Total environmental warming impact.
TEWI analysis:	Analysis of environmental warming impact using CO ₂ equivalents.
USCG:	US Coast Guard
VOC:	Volatile organic compound.

B 400 International recommendations, standards and references

401 International recommendations, standards and references have been used as foundation for the rules, although the rule requirements may be more stringent. When setting the emission and discharge limits, and determining the measuring procedure, due consideration has been given to technical and practical limitations inherent in the design and construction of different types of ships.

402 International recommendations, standards and references with provisions used by the Society when developing the rules are reflected in the references specified in 403 to 412. Unless a particular edition is explicitly referred to, the latest edition of each standard applies.

403 General references

Generally the rules refer to applicable parts of Annexes I, II, IV, V and VI of MARPOL 73/78/97. Other references for specific areas are given in 404 to 412.

404 Antifouling paint

Requirements for restrictions to use of TBT in antifouling paint refer to International Convention on the Control of Harmful Anti Fouling Systems, adopted by IMO in October 2001.

405 Ballast water

Requirements for restrictions to transfer of harmful organisms in ballast water refer to International Convention for the Control and Management of Ships' Ballast Water and Sediments.

406 Cargo handling vapour emission control systems

When considering vapour emission control systems the following references are used:

- IMO Standards for Vapour Emission Control Systems, MSC/Circ.585 and MARPOL Annex VI, reg. 15
- USCG 46, CFR 39.

407 Marine diesel engines

The NO_x content in marine diesel engine exhaust gases is referred to IMO's "NO_x Code" (NO_x Technical Code, (IMO MP Conf. 3/35 Res. 2)).

408 Marine fuel oil sulphur content

For the sulphur content of fuels, and the alternative SO_x-content in exhaust gases, is referred to:

- MARPOL Annex VI, and
- the EU Sulphur Directive 2005/33/EC.

Marine fuel oils shall be specified and tested according to Table B1.

Table B1 Marine fuel oils and sulphur emissions – Specification and testing references	
<i>Specifications of marine fuels</i>	ISO 8217, Petroleum Products – Fuels (Class F)
<i>Sampling</i>	IMO guidelines resolution MEPC.96(47) adopted on 8 March 2002
<i>Test method, fuel sulphur content</i>	ISO 8754 and/or Pr EN ISO 14596
<i>Test method, emission sulphur content</i>	ISO 7934/ISO 7935/ISO 11632

409 Approval of sulphur abatement technologies

If applicable, sulphur abatement technologies should be verified according to Resolution MEPC.130 (53) adopted on 22.07.2005 "Guidelines for on board exhaust gas-SO_x Cleaning system", taking into account:

- amendments to guidelines to be developed by the IMO
- effects on the environment, including achievable emission reduction, and impacts on ecosystems in enclosed ports, harbours and estuaries
- feasibility of monitoring and verification.

The sulphur abatement technology must document thoroughly that any waste stream discharged into enclosed ports, harbours and estuaries have no impact on ecosystems, based on criteria communicated by authorities of Port States to the IMO.

410 Refrigerants and fire-fighting media

When considering refrigerants and fire-fighting media and their effect on the ozone layer and global warming potential the "Montreal Protocol on Substances that Deplete the Ozone Layer" shall be used.

411 Shipboard incinerators

Incinerators, their design and use, shall comply with IMO res. MEPC.76(40) on Standard specification for shipboard incinerators.

412 Bilge water separators

Bilge water separators shall comply with IMO res. MEPC.107(49).

C. Information and Documentation

C 100 General

101 Drawings, technical information, certificates and operational procedures as specified in Tables C1, C2 and C3 are required for approval and/or information.

Guidance note:

It should be noted that some of the required documentation is additional to, and different from, documentation normally considered "Class documentation" as delivered from the newbuilding yard. This is in particular the case for operational procedures specified in Table C2 that may require input from the owner.

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102 Certificates and documentation of compliance

The certificates and other documentation of compliance given in Table C1 shall be available to the Society prior to assigning the class notations **CLEAN** or **CLEAN DESIGN**.

103 Discharge limiting and monitoring equipment shall be certified or type-approved.

104 Operational procedures

The operational procedures given in Table C2 shall be available and evaluated prior to assigning class notation **CLEAN** or **CLEAN DESIGN**.

105 Plans and particulars

The plans and particulars given in Table C3 shall be evaluated prior to assigning class notation **CLEAN** or **CLEAN DESIGN**.

C 200 In-service requirements

201 If approved arrangements, equipment or procedures are altered or modified documentation shall be resubmitted for approval.

202 The environmental performance of systems covered by the rules in this chapter shall be verified by inspection, measurements, and sampling, or by other equivalent means in accordance with the requirements of the rules in this chapter and in compliance with identified standards and guidelines. Data shall be gathered and kept onboard in appropriate logbooks for review during periodical surveys as defined in Pt.7 Ch.1 Sec.6 P.

Table C1 Required certificates and documentation of compliance

<i>Clean/Clean Design</i> ¹⁾	<i>A/I</i> ²⁾	<i>Document</i>
C/CD	I	Confirmation of Emergency Response Service contract with the Society, or another recognized classification society ³⁾
C/CD	I	Engine International Air Pollution Prevention Certificate (EIAPP), or equivalent statement of compliance to NO _x control according to MARPOL 73/78/97, Annex VI and NO _x emission test report approved by the Society if applicable.
C/CD	I	Incinerator type approval certificate in accordance with IMO resolution MEPC.(76)40
C/CD	I	Vapour emission control certificate, or statement of compliance with IMO MSC/Circ.585 or USCG's regulations for vapour control systems CFR 46 Part 39. (Alternatively class notation VCS-2)
C/CD	I	Certificate for the sewage system confirming compliance with the requirements of USCG 33 CFR 159, or MARPOL 73/78 Annex IV
C/CD	I	Copy of the AFS Certificate or Statement of Compliance to the International Convention on the Control of Harmful Anti-fouling Systems
(C)/CD	I	Statement of Compliance IMO Resolution "International Convention for the Safe and Environmentally Sound Recycling of Ships"
C/CD	I	Type approval of Ballast Water Treatment Plant according to resolution MEPC 127(53)
¹⁾ C = (required for) Clean (C) = (voluntary for) Clean CD = (required for) Clean Design		
²⁾ A = To be submitted for approval I = To be submitted for information		
³⁾ This requirement is not applicable for dry cargo ships of less than 3 000 GT and ships with class notation Supply Vessel and SF		

Table C2 Required operational procedures

<i>Clean/Clean Design</i> ¹⁾	<i>A/I</i> ²⁾	<i>Document</i>
C/CD	A	NO _x board verification procedure from the EIAPP Technical file or other means of NO _x verification in case of use of NO _x -abatement technology and NO _x emission test report approved by the Society if applicable.
C/CD	A	Fuel oil management plan for control of SO _x emissions, including fuel changeover procedure if relevant
C/CD	A	Bunkering procedure
C/CD	A	Refrigerant management procedures including refrigerant record book and refrigerant recovery procedures
C/CD	A	Refrigerant recovery procedure (may be included in refrigerant management procedures)
C/CD	A	Approved ballast water management plan and ballast water record book according to resolution MEPC 125(53)
C/CD	A	Garbage plans, including garbage record book as specified by MARPOL 73/78, Annex V, reg. 9(3).
C/CD	A	Sewage management plan including sewage discharge log
C/CD	A	Oil/water interface oil consumption log
¹⁾ C = (required for) Clean CD = (required for) Clean Design		
²⁾ A = To be submitted for approval I = To be submitted for information		

Table C3 Required plans and particulars		
<i>Clean/Clean Design¹⁾</i>	<i>A/I²⁾</i>	<i>Document</i>
C/CD	I	General arrangement and tank plan
CD	A	Drawings showing double hull protection for oil tanks, Ch.12 Sec.3 D100
C/CD	I	Fuel oil schematics including details of SO _x control methods, arrangement and system drawings, where applicable
C/CD	A	Drawings of any exhaust gas cleaning systems together with ECG System Technical Manual shall be approved in accordance with IMO guidelines
C/CD	A	Details and arrangement of refrigeration systems, including data sheet with information on intended refrigerant to be used
C/CD	I	Specification of all fire fighting systems and fire extinguishers, including data sheet with information on intended extinguishing media to be used in the respective systems
CD	I	Details and drawings of incinerator with system, if installed
C/CD	A	Details of cargo and non-cargo manifold areas, including drip trays and oil spill prevention arrangements
C/CD	I	Details and schematics of fuel oil systems, bilge systems and ballast water systems
CD	A	Details and schematics of garbage handling system
C/CD	I	Details and schematics of sewage handling system
C/CD	I	Details of refrigerant recovery Systems
C/CD	A	NO _x reducing device Technical Manual (NTM)
¹⁾ C = (required for) Clean CD = (required for) Clean Design ²⁾ A = To be submitted for approval I = To be submitted for information		

SECTION 2 CLASS NOTATION CLEAN

A. Introduction

A 100 General

101 The rules in this section cover emissions to air and give requirements for emissions to air from energy producers, cargo-handling systems and service systems on board the ship. References are made to national and international recommendations, standards and guidelines on emission criteria in relation to the protection of the environment concerning:

- ozone depletion
- global heating
- acidification
- resources.

102 The rules in this section cover discharges to sea giving requirements for discharges to sea from energy producers, lubrication and hydraulic systems, cargo/passenger handling systems, waste/sewage systems, underwater antifouling systems and ballast water systems on board ships. References are made to national and international recommendations, standards and references on discharge criteria in relation to protection of the environment.

103 Documentation required to be submitted for approval and verification of compliance with the rules is specified in Sec.1 C100.

B. Emissions to Air

B 100 General

101 All fuel oils intended for use onboard shall meet the following requirements:

- a) The fuel shall not contain inorganic acid.
- b) The fuel shall not include any added substances or chemical waste which either jeopardises safety of the ship or the performance of the machinery, is harmful to personnel, or contributes to additional air pollution. This shall not preclude incorporation of small amounts of additives intended to improve some aspects of performance.

102 Fuel oil management and control shall be carried out in accordance with a fuel oil management plan and fuel oil log. The fuel oil log shall document the qualities of the fuel ordered and the qualities of the received fuel as described by the bunker delivery note, see MARPOL 73/78/97, Annex VI, reg. 18.3 and 18.4, and 99/32/EU with amendments.

The Fuel Oil Management Plan shall incorporate adequate fuel change over procedures to ensure that the fuel utilised in the engine at the time when entering a SO_x restriction area is of the required quality. Relevant log books shall provide proof that fuel of the required quality has been utilised in the relevant areas.

103 The bunker delivery note shall be accompanied by a representative sample of the fuel delivered, sealed and signed by the supplier's representative and the master or officer in charge of the bunker operation. The bunker delivery note shall be retained on board for three years. The fuel sample shall be retained under the ship's control until the fuel is consumed but not for less than twelve months after the time of delivery.

104 The sampling equipment and test procedures shall comply with the IMO guideline for sampling, based on the standards referred to in Table B1, Sec.1 B408, or equivalent.

105 The ship shall hold a valid International Air Pollution Prevention Certificate under MARPOL Annex VI.

B 200 Marine diesel engines

201 Engine emissions for diesel engines with a power output >130 kW installed on all ships shall comply with Tier II, MARPOL limits. The maximum limits for NO_x per kWh, dependent on engine type as identified by engine r.p.m., is specified in Table B1.

Table B1 Maximum limits for NO _x per kWh as function of engine r.p.m.	
n < 130 r.p.m.	14.4 g/kWh
130 < n < 2 000 r.p.m.	44.0 n ^(-0.23) g/kWh
n > 2 000 r.p.m.	7.7 g/kWh

202 For engines where NO_x reduction systems are fitted, the system shall be operated and controlled in accordance with procedures incorporating the manufacturer instructions. The system and the relevant NO_x reducing device Technical Manual (NTM) will be subject to approval.

Guidance note:

NO_x level measurements

NO_x level measurements on diesel engines, with or without NO_x reduction arrangements, should comply with the methods specified in IMO NO_x Technical Code referred to from MARPOL 73/78 Annex VI, or other equivalent methods accepted by the Society. Measurements and tests should be documented, as required by the Society. Where documentation shall be applied for class notation only, independent third party witnessing and verification of tests may be waived.

Engine modification and adjustments

NO_x reductions by modification of engine parameters, water injection, fuel/water emulsification and/or by adjusting engine settings in order to influence the combustion characteristics, should be specified by the engine manufacturer and carried out under his supervision. The chosen combination of modifications and adjustments should aim to avoid an increase in the engine's fuel consumption. The engine shall not be adjusted outside the allowable ranges as specified in the Technical File (where applicable) unless a Direct Measurement and Monitoring device has been fitted and approved by the Society.

Descriptions of any changes affecting the designated engine parameters, including adjustments, parts replacements and modifications to engine parts, shall be recorded chronologically in an engine's record book of engine parameters.

Selective Catalytic Reduction (SCR)

Any requirements related to engine performance where SCR systems are fitted should be identified and addressed in an approval letter to the required documentation as specified in Sec.1 C100. The approval letter should also identify operational temperature limits.

- The reducing agent and the relevant consumptions should be specified by the manufacturer. If other agent than urea-solution is used, this will be subjected to special consideration.

In the case where the NO_x emission level is used to verify or control the reduction agent injection rate, the level should be detected by an analyser. Measuring equipment used for this purpose should be according to 1997 MARPOL Resolution 2, NO_x Technical Code, pt. 5.4.

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B 300 SO_x emissions

301 The requirements in B300 shall apply to any fuel consumed onboard, including but not limited to fuel for diesel engines, boilers, incinerators.

Guidance note:

Incineration of sludge is not subject to the requirement in B300.

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302 SO_x emission limits are generally achieved by use of low sulphur content fuel oil. Alternatively, an exhaust gas cleaning system can be adopted in order to obtain the required reductions of SO_x. The maximum sulphur content in fuel oil carried onboard is 3.0% S. Alternatively, SO_x cleaning can be used to achieve a general SO_x-content in the exhaust gas of maximum 12.0 g SO_x/kWh.

303 When in ports or in SO_x-controlled areas, the allowable maximum sulphur content in fuel oil used is 1.5% S. Changes of fuel type when entering and leaving port, or other SO_x-controlled areas, shall be documented by entries in the ship's log-book. Alternatively, SO_x cleaning can be used to achieve a general SO_x-content in the exhaust gas of maximum 6.0 g SO_x/kWh.

304 In areas with local regulations for sulphur content in fuel the stricter requirement shall apply. Changes of fuel type to comply with local regulations shall be documented by entries in the ship log book.

305 For engines controlling the emission of SO_x through an exhaust gas cleaning system, the SO_x content of the exhaust gas shall be verified in accordance with standards specified in Sec.1 B409. According to Resolution MEPC.140 (53) adopted on 22.06.2005 "Guidelines for on board exhaust gas-SO_x Cleaning system and under the surveillance of the Society.

B 400 Refrigerants

401 The emission criteria for refrigerants apply to cargo refrigeration plants, centralised air conditioning and refrigeration systems onboard all ships. Domestic type stand-alone air conditioning units and refrigerators need to comply with 402, 403 and 404 only.

Guidance note:

Domestic type stand alone units are typically cabin refrigerators, water coolers, ice machines, small air-conditioning units, vending machines, etc.

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402 The emission criteria for refrigerants are limited to requirements related to the properties of the refrigerant used with respect to its ozone depleting potential and to its global warming potential (ODP/GWP) as defined by the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer.

403 The use of ozone depleting substances is not permitted. The refrigerant may be any of the following:

- HFC
- Natural refrigerants such as NH₃ or CO₂.

The used refrigerant shall comply with: GWP < 3 500.

Guidance note:

As an alternative to GWP < 3 500 documented equivalent TEWI (Total Equivalent Warming Impact) may be accepted.

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404 A list of all refrigerant systems onboard defined in 401 shall be included in the manual.

405 Refrigerant systems shall have suitable means of isolation to allow maintenance without releasing any bulk quantity of the refrigerant to the atmosphere. Isolating valves should be provided to permit compressor removal and replacement without losing the refrigerant charge. A suitable permanent valve for a recovery connection should be provided on all appliances.

Unavoidable minimum releases associated with recapture or recycling are acceptable provided recovery units are installed

for the evacuation of the system.

406 For refrigerant recovery, compressors shall be capable of evacuating a system charge into a liquid receiver.

When the condenser itself shall be repaired the refrigerant must be transferred to:

- 1) other condenser(s) inside the system:
if the system has two or more condensers, when one of them shall be repaired, the others shall have enough capacity to hold the entire charge of the refrigerant system.
- 2) outside of the refrigerant system:
a dedicated container of sufficient volume is used to house the largest refrigerant circuit of the unit. This container shall be available and permanently located close to the unit. The procedure for how to use the recovery unit shall also be provided onboard.

Additionally, recovery units and associated equipment shall be provided to facilitate evacuation of the system either into existing liquid receivers or into suitable reservoirs.

407 Annual refrigerant leakage shall be as small as possible but not more than 10% of the total refrigerant charge for each system. The leakage shall be documented through recorded consumption figures. The figures shall include topping up due to leakage, as well as renewal of refrigerant during repairs or overhauls. The refrigerant log shall at least include: date, system type, refrigerant type, initial system charge, refrigerant added, refrigerant recovered, signature and type of inspection performed.

If leakage is observed, corrective measures as detailed in the refrigerant management procedure defined in 410 shall be implemented. Corrective action shall be carried out when leakage is detected. Type of failure, corrective actions and amount of recharged refrigerant shall be logged.

408 Where different types of refrigerants are used, measures shall be taken in order to avoid mixing of these substances.

409 Refrigerants in refrigeration systems shall be controlled in a manner suitable for detection of all types of leakage, including those normally not detected by an automatic leak detection system. Acceptable solutions are a combination, of the following:

- leak detection system appropriate to the applicable refrigerant with automatic alarm if presence of refrigerant is measured outside the refrigeration system; in combination with
- level measurement in refrigeration system with alarm for low level; or
- logging refrigerant volumes at regular intervals. As a minimum once per week.

This log shall at least include: date, system type, refrigerant type, initial system charge, refrigerant level, signature and type of inspection performed.

The intent of this paragraph shall ensure that leaks to the atmosphere are avoided, or kept to a minimum. The efficiency and practical layout need to be evaluated when deciding what approach to use for leak detection.

Guidance note:

The chosen solution may be in addition to, or in combination with, safety requirements for "potentially hazardous, non-essential installations" specified in the Rules for Classification of Ships Pt.4 Ch.1 Sec.3. The requirements in Pt.6 Ch.12 Sec.2 shall not replace requirements in the Rules for Classification of Ships Pt.4 Ch.1 Sec.3.

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410 The chosen method for detecting leakage should be submitted. A refrigerant management procedure must be implemented, covering as a minimum the following:

- how to monitor the refrigerant system with respect to possible leaks
- how often any such monitoring shall take place
- limits for when corrective actions shall be initiated.

B 500 Cargo evaporation

501 The criteria for emissions from cargo evaporation apply for tankers carrying crude oil, petroleum products or chemicals with flash point less than 60°C. These emissions are defined as volatile organic compounds, VOC.

502 Where applicable, ships shall hold a valid Class Notation **VCS-2**, see Ch.10 Sec.1 A200.

B 600 Fire fighting substances

601 Natural substances used in fixed fire fighting systems and extinguishers, are not considered damaging to the atmosphere. If other substances are used in fixed fire fighting systems that may have a global warming potential, the used substance shall comply with:

GWP < 4 000

ODP = 0.

Guidance note:

Natural substances: Natural substances: e.g. argon, nitrogen, water spray, high expansion foam, CO₂. Note that CO₂ in this context is considered a natural substance without ODP or GWP since it will utilise CO₂ already present in the atmosphere.

Other substances: E.g. industrial substances including Hydrofluorocarbons (HFC) and Sulphur fluorides.

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B 700 Shipboard incinerators

701 When installed onboard, incinerators shall be Type Approved in accordance with IMO res. MEPC.76(40) as amended by resolution MEPC.93(45).

702 All use of incinerators shall be in accordance with MARPOL 73/78, Annex VI, reg. 16, and be recorded in the oil record book referred to in MARPOL 73/78 Annex I, reg. 17 and in the garbage record book referred to in MARPOL 73/78, Annex V, reg. 9(3).

C. Discharges to Sea

C 100 General

101 Compliance with the rules in C shall be verified by means and measures as identified in Sec.1 C. Actual discharges shall be recorded as specified in 200 to 1000.

102 Ships with class notations **Tanker for Oil** or **Tanker for Chemicals** shall as a minimum have a double skin arrangement in the cargo area complying with MARPOL 73/78, Annex I, reg. 19, 21 and 22. Tank- and piping arrangement and hull subdivision shall be such that ballast tanks or piping systems are not contaminated by cargo.

C 200 Residues of cargo oil and chemicals

201 Discharge criteria for cargo residues apply to tankers carrying crude oil, petroleum products or chemicals.

202 Discharge of contaminated water or cargo residues into the sea shall be limited as far as practicable. Discharges and deliveries to shore shall be documented in the Oil record book, or Cargo record book, for tankers for oil and tankers for chemicals, respectively.

203 On tankers for chemicals the maximum allowable remaining cargo quantity shall be 0.075 m³ for all pollution categories. The pollution categories are defined in MARPOL Annex II, Appendix 1.

C 300 Cargo handling

301 Tankers for oil or chemicals shall have fitted and implemented means and arrangements to reduce the likelihood of cargo spill on deck reaching the sea.

Gutter plates on both sides of the cargo deck shall be increased in height from a point 0.2 L forward of midship to a termination at the aft end of the cargo deck with the minimum heights given in Table C1.

Table C1 Cargo deck gutter plates, minimum heights		
Ships greater than 100 000 tonnes DW	forward of 0.2 L:	0.25 m
	aft end:	0.30 m
Ships smaller than 100 000 tonnes DW	forward of 0.2 L:	0.10 m
	aft end:	0.30 m

To avoid cargo flowing around the accommodation/poop deck, a transverse fishplate shall be arranged at the aft end of the cargo area. At the outer end the transverse fishplate shall have the same height as and be connected to the aft end of the gutter plate.

302 For the collection of possible oil spills during cargo operations on tankers for oil the main deck in cargo area shall be fitted with a drainage system with discharge to a deck collecting tank or a slop tank. The drainage system may be arranged either with a manually operated valve, or with an automatic deck scupper drainage system.

The drainage shall be used during cargo operations where spillage may occur, and shall not affect normal deck drainage when at sea. When at sea drainage from the deck area shall be ensured to avoid free surface effects with negative impact on the ship's stability.

303 On tankers for oil or tankers for chemicals, all cargo manifolds shall be fitted with drip/spill trays with arrangements for draining. The drip/spill trays shall have the following minimum dimensions:

- length: beyond forward and aft ends of the manifold
- width: at least 1.8 m, though such that the spill tray extends at least 1.2 m outboard of the end of the manifold flange
- depth: minimum depth 0.3 m.

304 Tankers for oil or tankers for chemicals shall have fitted means to adequately support hoses in way of ship's side abreast of manifolds. The support shall preferably be arranged as a horizontal curved plate or pipe section.

305 Tankers for oil or tankers for chemicals shall have fitted a closed sounding system with high and high-high level alarms. Alternatively, a high level alarm can be accepted in combination with a closed sounding system, provided the alarm is independent from the sounding system.

306 Other ships carrying oil-containing liquids in bulk shall be equipped with arrangements as specified under Oil bunkering arrangements in C400.

Guidance note:

This applies to e.g. supply vessels and other ships carrying fuel oils and oil-based muds.

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This requirement does not apply to tanks carrying oily liquids during emergency operations only, e.g. tanks for oil recovered from oil spills at sea.

C 400 Oil bunkering arrangement

401 Fuel oil, lubricating oil and other oil bunker tanks on all ships shall be equipped with high level alarm to prevent overfilling.

402 Fuel oil, lubricating oil and other oil bunkering stations, vent and overflow pipes and other areas where spillage may occur shall be fitted with spill/drip trays to prevent oil escaping to sea. Capacity; 80 litres for ships between 300 and 1 600 GT, 160 litres for ships larger than 1 600 GT. Any spills at the bunker station and overflow through oil tank vent pipes, respectively, shall have a reasonable chance of being trapped by the spill/drip tray.

The specified minimum volume of the above spill/drip tray shall be obtained under all normal trim and for a maximum heel and trim inclination of ± 15 degrees.

Volume for the air pipes shall be deducted from the tray capacity in the volume calculations.

Coaming height shall be minimum 15% of the largest horizontal dimension.

Drawings showing spill/drip trays dimensions and volume calculations shall be submitted for approval.

403 Tanks with no risk of causing environmental contamination due to overfilling need not comply with 401 and 402. Typically this applies to internal tanks, e.g. engine room dirty oil and sludge tanks.

C 500 Ballast water

501 The intent of the discharge criteria for ballast water shall minimise or prevent transport of harmful aquatic organisms and pathogens from one geographical area to another.

Guidance note:

For the purpose of ballast water management, the International Convention for the Control and Management of Ships' Ballast Water and Sediments ("ballast water convention") is referred to.

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502 All ships shall comply with the International Convention for the Control and Management of Ships' Ballast Water and Sediment with amendments and Guidelines.

503 On all ships where ballast water operations are carried out, whether at sea, or in port, the ship's safety limitations shall be adhered to and have first priority at all times. Effects from ballast water operations on the ship's operability and safety shall be documented in the ballast water management plan approved by the Society. These shall as a minimum include all applicable loading conditions including effects on:

- draught and stability
- strength, including both local and global effects
- over- and under-pressurisation of ballast water tanks
- weather limitations, if any.

504 Vessels with additional class notation **BWM-E**, **BWM-EP**, **BWM-T** or **BWM-TP** (see Ch.18), are considered to fulfil the requirements in 501-503.

C 600 Bilge water

601 Discharge criteria for bilge water apply to all ships as defined by MARPOL 73/78, Annex I, reg. 14 and 15.

602 In addition to requirements specified by MARPOL Annex I, the ship shall be arranged with a bilge holding tank with facilities for delivery ashore.

C 700 Garbage

701 Disposal criteria for garbage apply to all ships as regulated by MARPOL, Annex V, reg. 3, 4, 5, 6 and 9.

702 A procedure for garbage sorting and volume reduction shall be available in addition to the garbage management plan required by MARPOL, Annex V, reg. 9.

C 800 Sewage

801 All ships shall hold a valid International Sewage Pollu-

tion Prevention Certificate or a certificate of compliance with MARPOL 73/78 Annex IV.

802 All ships shall be equipped with an approved sewage comminuting and disinfecting system (see MARPOL 73/78, Annex IV, reg.9), and a sewage holding tank. Sewage shall at least be treated by comminuting and disinfecting system prior to discharging.

Alternatively the ship shall be equipped with a sewage treatment system. The sewage treatment system shall be type approved (see MARPOL 73/78, Annex IV, reg.9).

803 Discharge requirements from MARPOL Annex IV reg.11 shall be observed. Sewage treatment and discharge shall be carried out according to approved sewage treatment procedures.

Sewage treatment procedure and log shall be included in the sewage management plan. The plan should also include procedure for using the log and special circumstances when discharge of untreated sewage is deemed necessary for the safe operation of the ship.

804 All sewage discharges, whether to sea or to reception facilities shall be recorded with description of date, location and quantity of sewage discharged. Alternatively start and stop of sewage treatment plant may be logged in place of discharged quantity.

In emergency cases where untreated sewage is discharged to sea, the records shall include information on the ship's speed and distance to nearest shore at the time of sewage discharge.

C 900 Antifouling

901 Discharges from underwater antifouling systems shall be considered for all ships.

902 The ship shall carry a Statement of Compliance with International Convention on the Control of Harmful Anti Foul-ing Systems.

903 Anti fouling paint systems containing TBT as the active ingredient are not permitted.

C 1000 Oil/Water interfaces

1001 Oil/water interfaces considered are:

- tailshaft lubrication
- rudder bearings
- sea water cooled engines
- hydraulically operated equipment.

1002 Oil/water interfaces oil consumption shall be monitored. If evidence of leakage is found, corrective action shall be initiated and recorded in the oil/water interface log.

Guidance note:

The method for monitoring oil/water interface oil consumption may be automatic, or manual. Follow up shall be such that smaller leaks are discovered to enable implementation of corrective action in case such leak is discovered.

This requirement is in addition to the low level alarm for the stern tube lube. oil header tank, ref. Pt.4 Ch.4 Sec.1 Table E1.

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1003 Where non-oil lubricated type bearings are used, no monitoring is required.

D. Other Aspects

D 100 Ship recycling

101 It is recommended that ships with class notation **CLEAN** shall hold and maintain a Green Passport under the IMO Resolution A.962(23) IMO Guidelines on Ship Recycling and any subsequent additions or amendments hereto

adopted at the relevant time.

102 If Green Passport Inventory shall be issued for the ship the document must be approved separately. Statement of Compliance with the IMO Resolution shall be submitted.

D 200 Environmental responsibilities

201 All ships shall have a responsible Environmental Officer onboard. This person shall be responsible for the following:

- compliance with current environmental regulations
- management and control of the procedures and activities relevant to the requirements of this section
- implementation and use of relevant procedures
- upkeep of relevant logs
- training of personnel in relevant environmental practices.

The Environmental Officer may delegate tasks to other personnel but will remain responsible for the environmental conduct of the ship.

SECTION 3 CLASS NOTATION CLEAN DESIGN

A. Introduction

A 100 General

101 The rules cover areas for emissions to air and discharges to sea similar to those described in Sec.2 A100.

102 Compared to the requirements for the class notation **CLEAN**, the class notation **CLEAN DESIGN** introduces stricter requirements for emissions to air and discharges to sea.

103 In addition, the design of the ship is covered by the class notation **CLEAN DESIGN**. The requirements are intended to prevent occurrence of accidents leading to pollution, and to limit the consequences of pollution if an accident should occur.

104 Documentation required to be submitted for approval and verification of compliance with the rules is specified in Sec.1 C100.

B. Emissions to Air

B 100 General

101 Compliance with the rules shall be verified by means and measures as identified in Sec.1 C.

102 All fuel oils intended for use onboard shall meet the requirements given in Sec.2 B100.

B 200 Marine diesel engines

201 Requirements for NO_x emissions from diesel engines apply to all diesel engines with power output in excess of 130 kW, except emergency diesel engines, engines installed in lifeboats and any other device or equipment intended to be used solely in case of emergency.

202 The maximum limits for NO_x per kWh, dependent on engine type as identified by engine r.p.m., is specified in Table B1.

Table B1 Maximum limits for NO _x per kWh as function of engine r.p.m.	
n < 130 r.p.m.	14.4 g/kWh
130 < n < 2 000 r.p.m.	44.0 n ^(-0.23) g/kWh
n > 2 000 r.p.m.	7.7 g/kWh

203 Equipment, arrangements and documentation for NO_x reduction shall be according to Sec.2 B202.

B 300 SO_x emissions

301 The requirements in B300 shall apply to any fuel consumed onboard, including but not limited to fuel for diesel engines, boilers, incinerators.

Guidance note:

Incineration of sludge is not subject to the requirement in B300.

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302 The sulphur content of fuel oil carried onboard shall not exceed the limits given in Sec.2 B302.

303 When in ports or in SO_x-controlled areas only, the allowable maximum sulphur content in the fuel oil used is 0.5% S. Changes of fuel type when entering and leaving port, or SO_x-controlled areas shall be documented by entries in the ship's logbook. Alternatively, SO_x cleaning can be used to achieve a general SO_x-content in the exhaust gas of maximum 2.0 g SO_x/kWh.

In areas with local regulations for sulphur content in fuel the stricter requirement shall apply. Changes of fuel type to comply with local regulations shall be documented by entries in the ship log book.

304 For engines controlling the emission of SO_x through an exhaust gas cleaning system, the SO_x content of the exhaust gas shall be verified in accordance with standards specified in Sec.1 B409, under the surveillance of the Society.

B 400 Refrigerants

401 Emission criteria for refrigerants onboard shall comply with requirements given in Sec.2 B400.

402 The refrigerant shall be either a natural refrigerant (e.g. NH₃ or CO₂), or alternatively an HFC complying with: GWP < 1 890 and ODP = 0.

Guidance note:

As an alternative to GWP < 1 890 documented equivalent TEWI (Total Equivalent Warming Impact) may be accepted.

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403 Design and operational requirements in Sec.2 B405 through 410 shall be complied with.

B 500 Cargo evaporation

501 Criteria for emissions from cargo evaporation apply to tankers carrying crude oil, petroleum products or chemicals with flash point less than 60°C, similar to those required in Sec.2 B500.

B 600 Fire fighting substances

601 Natural substances used in fixed fire fighting systems are not considered damaging to the atmosphere. If other substances are used in fixed fire fighting systems that may have a global warming potential, the used substance shall comply with:

GWP < 1 650
ODP = 0.

Guidance note:

Natural substances: Natural substances: e.g. argon, nitrogen, water spray, high expansion foam, CO₂. Note that CO₂ in this context is considered a natural substance without ODP or GWP since it will utilise CO₂ already present in the atmosphere.

Other substances: E.g. industrial substances including Hydrofluorocarbons (HFC) and Sulphur fluorides.

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B 700 Shipboard incinerators

701 Incinerator shall be installed.

702 Incinerators shall be designed, constructed and operated according to design and operational criteria for incinerators specified in Sec.2 B700.

703 Incinerator will not be compulsory if the vessel has enough capacity for 100% delivery to shore.

C. Discharges to Sea

C 100 General

101 Compliance with the rules in C shall be verified by means and measures as identified in Sec.1 C. Actual discharges shall be recorded as specified in Sec.1 C.

102 Requirements to hull arrangement in cargo area for vessels with class notations **Tanker for Oil** or **Tanker for Chemicals**, are defined in Sec.2 C102.

Vessels with class notation **Tanker for Oil** with the deadweight of less than 5 000 tonnes shall as a minimum have a double skin arrangement in the cargo area complying with the dimensions given in MARPOL 73/78, Annex I, reg. 19.6. Single skin cargo wing tanks are not accepted.

103 Hull arrangement including cargo tanks for other ships carrying oil-containing liquids in bulk shall comply with requirements in Sec.3 D100.

Guidance note:

This applies to e.g. supply vessels and other ships carrying fuel oils and oil-based muds.

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C 200 Residues of cargo oil and chemicals

201 General requirements to discharge of cargo residues are as given in Sec.2 C200.

202 On tankers for chemicals the maximum allowable remaining cargo quantity shall be 0.05 m³ for pollution categories B and C. The pollution categories are defined in MARPOL Annex II, Appendix 1.

203 Cargo tanks shall be designed with smooth surfaces and be equipped with cargo wells, or equivalent, for efficient stripping.

Guidance note:

Under-deck longitudinals of slab type are acceptable. Horizontal areas on stiffeners and brackets should be avoided, if possible. Horizontally corrugated bulkhead plating is acceptable with maximum angle of corrugations being 65°. Vertical girders in horizontally corrugated bulkheads will be accepted.

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204 Where applicable on tankers for oil, the COW efficiency shall be such that coverage of minimum 96% is obtained, as documented by shadow diagrams.

C 300 Cargo handling

301 Tankers for oil or chemicals shall have fitted and implemented means and arrangements to reduce the likelihood of cargo spill on deck reaching the sea, as given in Sec.2 C301.

302 For the collection of possible oil spills during cargo operations on tankers for oil the tank deck area shall be fitted with a closed drainage system with discharge to a deck collecting tank or a slop tank. The drainage system may be arranged either with a manually operated valve, or with an automatic deck scupper drainage system.

The drainage shall be used during cargo operations where spillage may occur, and shall not affect normal deck drainage when at sea. When at sea, drainage from the deck area shall be ensured to avoid free surface effects with negative impact on the ship's stability.

303 On tankers for oil, all cargo manifolds shall be fitted with drip/spill trays with the minimum dimensions as given in Sec.2 C300.

Manifold connections and spill trays shall be fitted with adequate means for closed drainage to a deck collecting tank or slop tank.

304 Tankers for oil or tankers for chemicals shall have fitted means to adequately support hoses in way of ship's side abreast of manifolds, as given in Sec.2 C300.

305 Tankers for oil or chemicals shall have fitted a closed sounding system with high level and high-high level alarms.

306 Other ships carrying oil-containing liquids in bulk shall be equipped with arrangements as specified in Sec.2 C306.

C 400 Oil bunkering arrangement

401 Fuel oil, lubricating oil and other oil bunkering arrangements shall be as given in Sec.2 C400.

402 Spill/drip trays shall be fitted with closed drainage to a deck collecting tank or slop tank.

403 For supply vessels only, requirements in 402 may be waived provided requirements in Sec.2 C400 are complied with.

C 500 Ballast water

501 Requirements for ballast water handling as given in Sec.2 C500 shall be complied with.

C 600 Bilge water

601 Discharge criteria for bilge water apply to all ships as defined by MARPOL 73/78, Annex I, reg. 14 and 15. The maximum oil content of bilge water discharged is 5 ppm.

602 Oil filtering equipment and 5 ppm alarm combined with an automatic stopping device shall be provided.

603 In addition, a bilge water holding tank shall be arranged as required for the class notation **OPP-F**. All drains from machinery space bilges shall be arranged such that they are drained into the bilge holding tank. Drainage of sea- or freshwater not contaminated by oil may be arranged to a wastewater holding tank that may be discharged overboard.

C 700 Garbage

701 Disposal criteria for garbage as given in Sec.2 C700 shall be complied with.

702 The ship shall be equipped and arranged for sorting, minimising and storing garbage prior to incineration or delivery to shore. Ships shall have sufficient capacity to allow 100% delivery to shore, or incineration where permitted.

Ships with class notations **Passenger Ship** or **Car Ferry A** (or **B**) shall not dispose any waste to sea except for food waste when having passed through a grinder or comminuter for food waste and where permitted by international and local legislation.

C 800 Sewage

801 Requirements to sewage discharge and handling as given in Sec.2 C800 shall be complied with, except where superseded by requirements 802 to 804.

802 Ships with class notations **Passenger Ship** or **Car Ferry A** (or **B**) shall have sewage holding tank(s) with sufficient capacity to allow storage of both sewage ("black water") and "grey water" when in port. The tank(s) shall be fitted with a high level alarm.

803 The ship shall be equipped with a sewage treatment system. The sewage treatment system shall be type approved (see MARPOL 73/78, Annex IV, reg.9).

804 Sewage treatment plants on ships with class notations **Passenger Ship** or **Car Ferry A** (or **B**) shall have included means to treat "grey water" in addition to "black water".

C 900 Antifouling

901 Requirements given in Sec.2 C900 shall be complied with.

C 1000 Oil/water interfaces

1001 Requirements to monitoring and control of oil/water interfaces given in Sec.2 C1000 shall be complied with.

D. Construction and Design

D 100 Oil tank protection

101 The requirements in D100 and D200 apply to tanks for fuel oil, lubricating oil, hydraulic oil and waste oil, including overflow tanks. Gravity based drain tanks may be considered specially.

The requirements also apply to cargo tanks on ships coming under regulation 2.2 of MARPOL Annex I.

102 Individual tanks shall not have a capacity of over 1 500 m³.

103 Tanks shall be located above the moulded line of the bottom shell plating nowhere less than the distance h as specified below:

$$h = B/20$$

or

$$h = 2.0 \text{ m, whichever is the lesser.}$$

The minimum value of $h = 0.76 \text{ m}$.

In turn of the bilge area and at locations without a clearly defined turn of the bilge, the oil fuel boundary line shall run parallel to the line of the midship flat of bottom as shown in Fig.1.

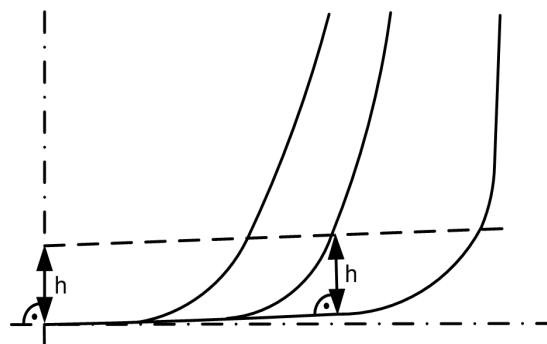


Fig. 1

104 For ships having an aggregate oil tank capacity below 5 000 m³ tanks shall be located inboard of the moulded line of the side shell plating, nowhere less than the distance w which, as shown in Fig.2, is measured at any cross-section at right angles to the side shell, as specified below:

$$w = 0.4 + 2.4 C/20\,000 \text{ m}$$

Where C is the vessels total volume of oil tanks, in m³, at 98% tank filling.

The minimum value of $w = 1.0 \text{ m}$, however for individual tanks with an oil capacity of less than 500 m³ the minimum value is 0.76 m.

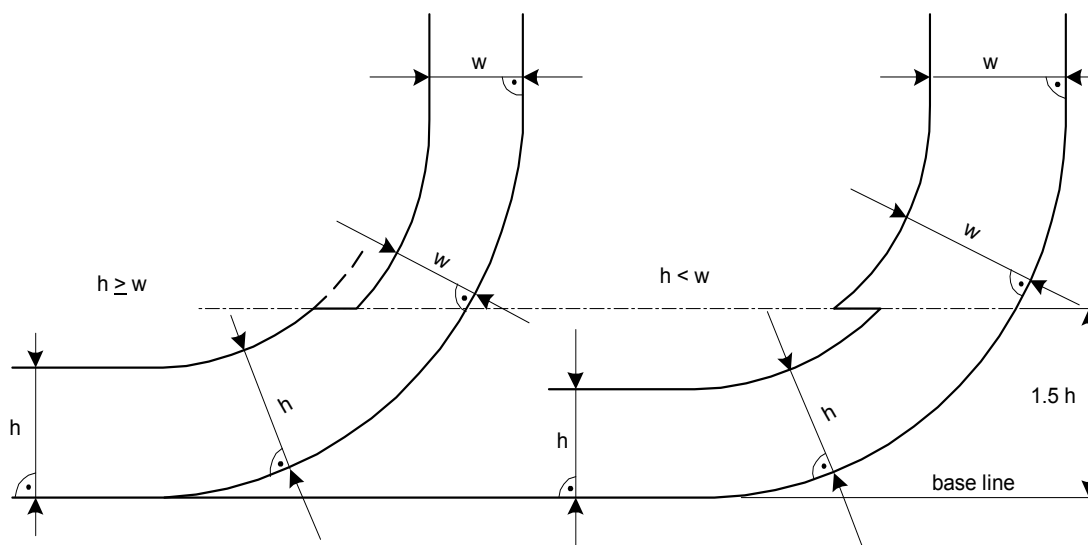


Fig. 2

105 For ships with an aggregate oil tank capacity of 5 000 m³ and over, tanks shall be located inboard of the moulded line of the side shell plating, nowhere less than the distance w which, as shown in Fig.2, is measured at any cross-section at right angles to the side shell, as specified below:

$$w = 0.5 + C/20\,000$$

or

$$w = 2.0 \text{ m, whichever is the lesser.}$$

The minimum value of $w = 1.0 \text{ m}$.

106 Combined fuel oil and water ballast tanks shall not be arranged.

D 200 Sundry

201 Lines of oil piping located at a distance from the ship's bottom less than h , as defined in 103, or from the ship's side less than w , as defined in 104 and 105 shall be fitted with valves or similar closing devices within or immediately adjacent to the tank. These valves shall be capable of being brought into operation from a readily accessible enclosed space the location of which is accessible from the navigation bridge or the propulsion machinery control position without traversing exposed freeboard or superstructure decks. The valves shall close in case of remote control system failure (fail to close) and shall be kept closed at sea at any time when the tank contains oil except when they may be opened during transfer operations.

202 Suction wells in oil tanks may protrude into the double bottom below the boundary line defined by the distance h provided that such wells are as small as practicable and the distance between the well bottom and the bottom shell is not less than $0.5h$.

D 300 Ship operation requirements

301 In the event of failure in the main propulsion system, alternative means of propulsion shall be available to allow the ship to maintain manoeuvrability. This may be satisfied by ships having **EP** class notation or a double drive train (engine shafting and propeller) and rudder system arrangement, or through a thruster arrangement. Any other propulsion arrangement will be subject to special consideration, ref. Sec.1. Table A1.

Guidance note:

Ships fulfilling the requirements specified for the class notation **RP** and **EP**, see Ch.2, satisfy this requirements.

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E. Other Aspects

E 100 Ship recycling

101 All ships shall hold and maintain a Green Passport under the IMO Resolution A.962(23) IMO Guidelines on Ship Recycling and any subsequent additions or amendments hereto adopted at the relevant time.

Guidance note:

IMO is developing mandatory ship recycling requirements, part of which encompasses a Green Passport for ships. Besides the details of the ship, the Green Passport includes an inventory of the materials known to be potentially hazardous, detailing the location and the approximate quantity or volume of each material, in 1) the ship structure and equipment, 2) operationally generated waste and 3) stores. Part 1) is prepared when the ship is new and is amended throughout the ship's life, whilst parts 2 and 3) are prepared prior to the final voyage to the recycling facility.

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102 Green Passport must be approved separately. Statement of Compliance with the IMO Resolution shall be submitted.

E 200 Environmental responsibilities

201 Requirements to a responsible Environmental Officer as defined in Sec.2 D200 shall be complied with.