NEWBUILDINGS
SPECIAL EQUIPMENT AND SYSTEMS – ADDITIONAL CLASS

Environmental class

JULY 2015
FOREWORD

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The Rules lay down technical and procedural requirements related to obtaining and retaining a Class Certificate. It is used as a contractual document and includes both requirements and acceptance criteria.

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Any comments may be sent by e-mail to rules@dnvgl.com

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million.

In this provision “Det Norske Veritas” shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.
CHANGES – CURRENT

General
This document supersedes the January 2014 edition.

Text affected by the main changes in this edition is highlighted in red colour. However, if the changes involve a whole chapter, section or sub-section, normally only the title will be in red colour.

Det Norske Veritas AS, company registration number 945 748 931, has on 27th November 2013 changed its name to DNV GL AS. For further information, see www.dnvgl.com. Any reference in this document to “Det Norske Veritas AS” or “DNV” shall therefore also be a reference to “DNV GL AS”.

Main changes July 2015, entering into force 1 January 2016

• General
The rules have been updated to make a clearer and more competitive rule set with a distinct difference between the basic notation CLEAN and the more enhanced notation CLEAN DESIGN.

• Sec.1 General
— Definitions of biofouling has been inserted. Subsequent items have been renumbered.
— A100 and A203: CLEAN DESIGN Tier III has been removed.
— A104 Table A1 has been revised.
— C200 Table C2 has been revised.

• Sec.2 Class notation CLEAN
— B200 Cargo evaporation and B300 Refrigerants have been relocated internally.
— B201 has been revised.
— B300 has been revised and moved from CLEAN to CLEAN DESIGN.
— Previous B500 Shipboard incinerators has been moved to Sec.3 B500 and amended.
— Previous C201: Cargo deck gutter plates have been moved from CLEAN to CLEAN DESIGN.
— Previous C300 Oil bunkering arrangements: Some of the requirements have been moved from CLEAN to CLEAN DESIGN.
— Previous C402 regarding Biofouling Management Plan: Moved from CLEAN to CLEAN DESIGN.
— C700 and C800 has been revised and parts moved to CLEAN DESIGN.

• Sec.3 Additional requirements for the qualifier DESIGN
— B400 and B500: Global warming potential (GWP) limit has been revised
— Previous C400 Washwater has been removed.
— D300 Oil residue - sludge tanks has been added.

Editorial corrections
In addition to the above stated main changes, editorial corrections may have been made.
E. Other aspects ................................................................................................................ 25
E 100 Ship recycling ............................................................................................................. 25

CHANGES – HISTORIC ......................................................................................................... 26
SECTION 1 GENERAL

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 vessels. The requirements are in compliance with or more extensive than those found in international standards currently in force. Vessels complying with the requirements in this chapter may be given two options:

   — CLEAN
   — CLEAN DESIGN

102 The rules aim at attaining a vessel 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 Vessels with class notations covered by this chapter shall comply with the requirements specified in Table A1.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Class notation with qualifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessels 1) shall be enrolled in the Emergency Response Service (ERS) administered by the Society or similar service provided by another recognized organization</td>
<td>CLEAN</td>
</tr>
<tr>
<td>Vessels shall hold class notation, NAUT-AW, see Ch.8 or NAUT-OSV(A), see Ch.20 2)</td>
<td>Not required</td>
</tr>
<tr>
<td>Vessels shall hold class notation RECYCLABLE 2)</td>
<td>Not required</td>
</tr>
<tr>
<td>Vessels shall have BWMS according to the International Convention for the Control and Management of Ships' Ballast Water and Sediment</td>
<td>D-1 or D-2 Standard 3)</td>
</tr>
<tr>
<td>Vessels shall hold class notations VCS-2 5) (Ch.10). (vapour emission from cargo tanks)</td>
<td>Yes</td>
</tr>
<tr>
<td>Vessels shall hold class notation ECA(SOx-A) 6) (Ch.25). (meeting requirements for Emission Control Areas)</td>
<td>Not required</td>
</tr>
<tr>
<td>Statement of Compliance with respect to MARPOL Annex V</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1) Vessels less than 5000 GT and vessels designed for offshore operations with class notation SF or better damage stability do not need to meet this requirement. Gas fuelled vessels do not need to meet this requirement if not intended for carrying cargo with large pollution potential.

2) Statement of Compliance for Inventory of Hazardous Materials may be accepted as an equivalence to class notation Reyclable, e.g. for class entries and vessels in operation (new assignment to CLEAN).

3) Vessels shall have either class notations BWM-E or BWM-T or Statement of Compliance/Certificate of Compliance with Standard D-1 or D-2 of the international ballast water management convention.

4) Vessels shall have either class notations BWM-T or Statement of Compliance/Certificate of Compliance with standard D-2 of the international ballast water management convention.

5) Applies to Tanker for Oil, Tanker for Oil Products or Tanker for Chemicals.

6) Gas fuelled vessels, ships operating continuously with low sulphur fuels [below 0.1% sulphur mass content] and vessels equipped with type approved exhaust gas cleaning system for SOx are accepted as equivalent to the ECA notation.

7) NAUT-OSV(A) is applicable to offshore vessels, NAUT-AW is applicable to passenger ships, tankers, bulk carriers, container ships, etc.

A 200 Class notation and qualifiers

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 with the qualifier DESIGN identifies additional requirements for controlling and limiting operational emissions and discharges. In addition, this qualifier 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 vessel, energy consumers, cargo, passengers, and crew onboard 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 vessel, energy consumers, cargo, passengers, and crew onboard 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 facilities, for controlling, disposal, recycling etc.

104 Port
The vessel 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 vessel’s logbook.

105 SOx emission control area (ECA Emission Control Area)
SOx emission control areas are defined in the revised MARPOL Annex VI and in the EU Sulphur Directive 99/32/EC as amended (2005/33/EC) with proposed amendments.

B 200 Definitions and characteristics, systems and components

201 Ballast water
Water with its suspended matter taken onboard a vessel to control trim, list, draught, stability or stresses of the vessel.

202 Ballast water management system
Any system which processes ballast water such that it meets or exceeds the Ballast Water Performance Standard in Regulation D-2 in the Ballast Water Management Convention. The BWMS includes ballast water treatment equipment, all associated control equipment, monitoring equipment and sampling facilities.

203 Cargo handling systems
Cargo handling systems 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, tanker for oil products, offshore service vessels and well stimulation vessels).
— Pumping and piping systems for tankers carrying cargoes that may cause global or local pollution.

204 Residues of cargo oil and chemicals
Remains of cargo (oil or chemical contaminated water from cargo tank area, slop tanks and cargo pump room).

205 Fire fighting media
Active fire fighting media used in fixed fire fighting systems.

206 Garbage
Garbage includes all kinds of provisions, domestic and operational waste excluding fresh fish and parts thereof, generated during normal operation of the vessel and liable to be disposed of continuously or periodically except those substances excluded specifically. Cargo residues from dry cargo vessels are considered as garbage. Sewage and waste oils are defined separately and not as garbage.

207 Anti-fouling systems
A coating, paint, surface treatment, surface, or device used to control or prevent attachment of un-wanted organisms.

208 Biofouling
The accumulation of aquatic organisms such as micro organisms, plants, and animals on surfaces and structures immersed in or exposed to the aquatic environment. Biofouling can include microfouling and macrofouling.

209 Macrofouling
Large, distinct multicellular organisms visible to the human eye such as barnacles, tubeworms, or fronds of algae.
210 Microfouling
Microscopic organisms including bacteria and diatoms and the slimy substances that they produce. Biofouling comprised of only microfouling is commonly referred to as a slime layer.

211 Refrigerants
Refrigerant media used in cargo refrigeration plants, air conditioning and refrigeration systems onboard all vessels, including domestic stand alone units.

212 Sewage (black water)
— 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.

213 Grey water
— Drainage from dishwasher, galley, shower, laundry, bath, washbasin drains and WC scuppers.

214 Oil residue (sludge)
The residual waste oil products generated during the normal operation of a vessel such as those resulting from the purification of fuel or lubricating oil for main or auxiliary machinery, separated waste from oil filtering equipment, waste oil collected in drip trays, and waste hydraulic and lubricating oils.
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.

215 Oil residue (sludge) tank
A tank which holds oil residues (sludge) from which sludge may be disposed directly through the standard discharge connection or any other approved means of disposal.

216 Oily bilge water
Water which may be contaminated by oil resulting from things such as leakage or maintenance work in machinery spaces. Any liquid entering the bilge system, bilge piping, tank top or bilge holding tanks is considered oily bilge water.

217 Oily bilge water holding tank
Means a tank collecting oily bilge water prior to its discharge, transfer or disposal.

218 Food waste
Any spoiled or unspoiled victual substances, such as fruits, vegetables, dairy products, poultry, meat products, food scraps, food particles and all other materials contaminated by such wastes, generated onboard ship, principally in the galley and dining areas.

219 NOx-abatement technology
A system for the purpose of reducing NOx emissions to air.

220 SOx-abatement technology
An exhaust gas cleaning system for the purpose of removing sulphur oxides (SOx) from the exhaust.

221 Processed clean bilge water tank
A tank which holds processed water from the oil filtering equipment

222 Clean drain tank
A tank which holds internal drains such as those resulting from the leakage of and condensate from equipment used for seawater, freshwater, steam, air conditioning etc. which are not normally contaminated by oil.

B 300 Abbreviations
BCH Code Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (Bulk Chemical Code)
CFC Chlorofluorocarbons
CFR Code of Federal Regulations
GWP Global warming potential. (CO2 = 1, time horizon 100 years)
HCFC Hydrochlorofluorocarbons
HFC Hydrofluorocarbons
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 vessels.

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. 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 (AFS/CONF/26).

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, 2004 (BWM/CONF/36).

406 Cargo handling vapour emission control systems
Following references are used:
— IMO Standards for Vapour Emission Control Systems, MSC/Circ.585 and revised MARPOL Annex VI, Regulation 15
— USCG Title 46, CFR Part 39.

407 Marine diesel engines
IMO’s “NOx Technical Code” (IMO MP Conf. 3/35 Res. 2).

408 Sulphur abatement technologies
If applicable, sulphur abatement technologies should be verified according to Resolution MEPC.184(59)
adopted on 17th July 2009 “Guidelines for on board exhaust gas-SOx cleaning system”, taking into account local legislation (e.g. EU requirements) and amendments if any.

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.

409 Refrigerants and fire fighting media
Refers to “Montreal Protocol on Substances that Deplete the Ozone Layer”.

410 Shipboard incinerators
Refers to IMO Resolution MEPC.76(40) on Standard specification for shipboard incinerators.

411 Bilge water separators
Refers to IMO Resolution MEPC.107(49).

412 Sewage treatment plant
Refers to IMO Resolution MEPC.159(55).

C. Information and documentation

C 100 General

101 Documentation shall be submitted as required by Table C1.

102 Discharge limiting and monitoring equipment shall be certified or type-approved as required by Table C2.

103 For general requirements to documentation, see Pt.0 Ch.3 Sec.1.

104 For a full definition of the documentation types, see Pt.0 Ch.3 Sec.2.

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>
<thead>
<tr>
<th>Table C1 – Documentation requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object</td>
</tr>
<tr>
<td>Fuel and lubrication oil systems</td>
</tr>
<tr>
<td>Fuel oil system</td>
</tr>
<tr>
<td>Biofouling</td>
</tr>
<tr>
<td>Sewage system</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Garbage disposal system</td>
</tr>
</tbody>
</table>
### Table C1 – Documentation requirements (Continued)

<table>
<thead>
<tr>
<th>Object</th>
<th>Documentation type</th>
<th>Additional description</th>
<th>Info</th>
<th>Qualifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenhouse gas handling</td>
<td>S010 – Piping diagram</td>
<td>Refrigeration and air conditioning systems</td>
<td>AP</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Z100 – Specification</td>
<td>Fire fighting systems, including data sheet for extinguishing media</td>
<td>FI</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Z110 – Data sheet</td>
<td>Refrigerants</td>
<td>FI</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Z160 – Operation manual</td>
<td>Refrigerant management procedures</td>
<td>AP</td>
<td>All</td>
</tr>
<tr>
<td>Oil pollution prevention</td>
<td>Z180 – Maintenance manual</td>
<td>Template of the oil consumption log for oil/water interfaces</td>
<td>FI</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Z030 – Arrangement plan</td>
<td>Cargo and non-cargo manifold areas, including drip trays and oil spill prevention arrangements</td>
<td>AP</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Z231 – Bilge water and sludge management plan</td>
<td></td>
<td>AP</td>
<td>DESIGN</td>
</tr>
<tr>
<td>Cargo piping system</td>
<td>Z030 – Arrangement plan</td>
<td>Side view of manifold arrangement. Including relevant data requested by OCIMF Standard Sec. 1 and 2. Applicable for tankers for oil or chemicals</td>
<td>AP</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Z030 – Arrangement plan</td>
<td>Means to support hoses in way of ship's side abreast of manifolds. Applicable for tankers for oil or chemicals</td>
<td>AP</td>
<td>All</td>
</tr>
<tr>
<td>Cargo storing arrangements</td>
<td>H210 – Protected tank location drawing</td>
<td>Applicable for all tanks containing oil or oil based liquids. Applicable for tankers for oil or chemicals</td>
<td>AP</td>
<td>DESIGN</td>
</tr>
</tbody>
</table>

### Table C2 Certificate requirements

<table>
<thead>
<tr>
<th>Object</th>
<th>Certificate type</th>
<th>Additional description</th>
<th>Qualifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oily bilge water separator</td>
<td>DNV type approval certificate</td>
<td>5 ppm is required for the qualifier <strong>DESIGN</strong></td>
<td>DESIGN</td>
</tr>
<tr>
<td>Oily bilge water control and monitoring system (alarm)</td>
<td>Type approval certificate</td>
<td>5 ppm alarm is required for the qualifier <strong>DESIGN</strong></td>
<td>DESIGN</td>
</tr>
<tr>
<td>Ballast water treatment system</td>
<td>DNV type approval certificate¹</td>
<td></td>
<td>DESIGN</td>
</tr>
</tbody>
</table>

1) Ballast water treatment systems type approved by other recognized organizations according to IMO guidelines for approval of ballast water management systems (G8), Res. MEPC.174(58), may be accepted.
SECTION 2 CLASS NOTATION CLEAN

A. Introduction

A 100 General

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

102 The rules in this section give requirements for limiting discharges to sea from energy producers, lubrication and hydraulic systems, cargo/passenger handling systems, waste/sewage systems, underwater antifouling systems and ballast water systems onboard vessels. 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.

104 All ships shall comply with applicable MARPOL Convention requirements and International Convention on the Control of Harmful Anti Fouling Systems (AFS/CONF/26) regardless of any exemption(s) granted by flag state or other authorities.

B. Emissions to air

B 100 General

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

— The fuel shall not contain inorganic acid.
— The fuel shall not include any added substances or chemical waste which either jeopardises safety of the vessel 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.

103 The Fuel Oil Management Plan shall include description of the fuel oil quality according to 101, sulphur content in the fuel used onboard and shall document the qualities of the fuel ordered and the qualities of the received fuel as described by the bunker delivery note, see MARPOL, Annex VI, Regulation 18.5 and 18.6, and 99/32/EU with amendments.

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

105 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 onboard for three years. The fuel sample shall be retained under the vessel’s control until the fuel is consumed but not for less than twelve months after the time of delivery.

B 200 Cargo evaporation

201 Tanker for oil or oil products and tanker for chemicals shall hold a valid class notation VCS-2, see Ch.10 Sec.1 A200.

B 300 Refrigerants

301 The requirements in this section shall apply to all refrigeration systems having more than 10 kg initial charge of a refrigerant including but not limited to cargo refrigeration plants, centralised air conditioning systems, provision plants, MGO chiller units. Domestic type stand-alone air conditioning units and refrigerators do not fall into requirements of this section.

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

---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---
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.

A list of all refrigerant systems onboard defined in 301 shall be included in the refrigerant management plan.

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.

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:
- 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.
- 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.

These requirements do not apply to systems using R717 (ammonia) as refrigerant due to safety reasons.

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, type of failure, initial system charge, refrigerant added, refrigerant recovered, signature type of inspection performed and corrective actions.

If leakage is observed, corrective measures as detailed in the refrigerant management procedure shall be implemented.

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

Refrigerants in refrigeration systems shall be controlled and monitored in a manner suitable for detection of all types of leakage. One or more than one of the following methods for leak detection shall be used:
- an automatic detection system with sufficient sensitivity for refrigerants
- logging refrigerant volumes at regular intervals. As a minimum once per week or
- weekly control of leakages by portable refrigerant detector.

Guidance note:
The chosen solution may be in addition to, or in combination with, safety requirements specified in Pt.4 Ch.1. The requirements in this section shall not replace requirements in Pt.4 Ch.1.

The chosen method for detecting refrigerant leakages shall be described in refrigerant management plan and justified to be suitable for the refrigeration system which is applied. Refrigerant management plan shall include the following procedures.
- 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
- procedures detailing the means to control, leakage, venting and disposal of refrigerants
- log sheet for logging refrigerant volumes.

The log sheet shall include the following:
1) In case regular monitoring of the refrigerant’s volumes are used: type of system, date, time, volume, temperature and pressure of the refrigerant, % of leakage, corrective actions taken and signature of the responsible person.
2) In case portable refrigerant detectors are used: type of system, date, time, whether leakage is detected or not, location of leakage, corrective action taken and signature of the responsible person.

**B 400 Fire fighting substances**

401 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 < 4000
- ODP = 0.

**Guidance note:**
The GWP values from the IPCC Fourth Assessment Report or latest IPCC publication shall be used.

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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**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 800.

**C 200 Cargo handling**

201 On tankers for oil or tankers for chemicals, all cargo manifolds shall be fitted with drip/spill trays with adequate means for closed drainage to a deck collecting tank or slop tank.

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.

202 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 vessel's stability.

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

204 Tankers for oil or tankers for chemicals shall have fitted a closed sounding system and an overflow alarm which is independent of the closed sounding systems.

205 Other vessels carrying oil-containing liquids in bulk shall be equipped with arrangements as specified under Oil bunkering arrangements in 300.

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.

**Guidance note:**
This applies to e.g. supply vessels and other vessels carrying fuel oils and oil-based mud.

---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---

**C 300 Arrangements for fuel oil bunkering and other oil filling stations**

301 All fuel oil bunker tanks shall be equipped with high level alarm to prevent overfilling. High level alarms need not be fitted to fuel oil bunker tanks that are provided with an overflow line to another fuel oil storage/service tank, which is fitted with a high level alarm. If vessel is fitted with a fuel oil overflow tank, there shall be a level alarm installed at low level of the fuel oil overflow tank as well.
Guidance note 1:
Alarm boxes located in the overflow line between fuel oil tanks and fuel oil overflow tanks may be accepted as
equivalence to the level alarm required inside fuel oil overflow tanks.

---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---

Guidance note 2:
High level alarms required in 301 may be triggered from the remote sounding system.

---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---

302 The alarm signal shall be given where the person in charge of the bunkering or transfer operation will
normally be located. The time between the high level alarm and the overfill level of the tank shall be at least
2 minutes.

303 Fuel oil, lubricating oil and other oil filling stations and other areas where spillage may occur shall be
fitted with spill/drip trays to prevent oil escaping to sea. Minimum capacity: 80 litres for vessels less than 1600
GT, 160 litres for vessels equal to or larger than 1600 GT. Any spills at the bunker station shall have a
reasonable chance of being trapped by the spill/drip tray.

304 Vent and overflow pipes for fuel oil tanks, lubricating oil tanks, hydraulic oil tanks and overflow tanks
shall be fitted with spill/drip trays with the following minimum capacity: 40 litres for vessels less than 1600
GT, 100 litres for vessels equal to or larger than 1600 GT.
Volume for the pipes shall be deducted from the tray capacity in the volume calculations.
One spill/drip tray can be used for several vent and overflow pipes and the capacity shall minimum be as
required for one pipe.
Coaming height of the spill/drip trays shall be minimum 15% of the largest horizontal dimension.

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

306 Tanks with no risk of causing environmental contamination due to overfilling need not comply with
C300. Typically this applies to those small internal tanks which will be filled up locally from oil drums or their
overflow vent pipes end up in engine room area.

C 400 Ballast water

401 Ballast water discharges from vessels shall comply with the D-1 (exchange method) or D-2 (treatment
method) standard of the International Convention for the Control and Management of Ships' Ballast Water and
Sediment with amendments and Guidelines.

C 500 Bilge water

501 The vessel shall be arranged with a bilge holding tank with facilities for delivery ashore.

C 600 Garbage

601 The vessel shall be provided with a Garbage Management Plan. It shall be approved to ensure it has been
developed in accordance with Res. MEPC.220(63) 2012 Guidelines for the development of Garbage
Management Plans.

Guidance note:
Statement of Compliance with respect to MARPOL Annex V does not require “Garbage Management Plan” to be
approved, but class notation CLEAN requires both approval of Garbage Management Plan and issuance of Statement
of Compliance for MARPOL Annex V after successful survey onboard.

---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---

C 700 Sewage

701 The vessel shall be equipped with a type approved sewage treatment system in accordance with
MEPC.159(55).

Guidance note:
Passenger ships operating within a special area shall have a type approved sewage treatment system in accordance
with MEPC.227(64) from 2016 (new passenger ships) or 2018 (existing passenger ships).

---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---

702 All sewage shall be treated by the type approved sewage treatment system prior to discharge.

703 Bio Waste (sewage sludge) which is produced during the sewage treatment operation can be discharged
overboard according to MARPOL criteria, i.e. at a distance more than 12 nautical miles and at moderate rate
when the ship is en route and proceeding at not less than 4 knots. The rate of discharge shall be according to
recommendation on standards for the rate of discharge on untreated sewage given in MEPC.157(55).
Overboard discharge pipes for excess bio waste (sewage sludge) should be separated from overboard discharge pipes of treated sewage or an appropriate cleaning of the discharge pipe shall take place after each use of the sludge pump, e.g. flushing. The procedures shall be written in sewage management plan.

C 800 Oil/water interfaces

Oil/water interfaces considered are any surface where lubricating oil or grease can leak to the sea, example:

- stern tube bearing
- rudder bearings (grease or oil)
- bow thrusters and azimuth thrusters
- fin stabilisers
- sea water cooled engines
- hydraulically operated equipment.

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 (at least once per week). 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.

---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---

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

D. Other aspects

D 100 Environmental responsibilities

All vessels shall have a responsible Environmental Officer onboard. Name/position of the officer in charge and relevant duties shall be listed in the required manuals. 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 vessel.

D 200 Operation manuals

The operational manuals shall be readily available onboard can either be “stand alone documents”, or be parts of the vessel’s SMS (safety management system) documentation, or be compiled in a CLEAN class manual (or any combinations thereof).

The CLEAN class manual shall at least contain the following as independent chapters (any chapter may be exchanged to a reference on where to find elsewhere):

CLEAN class manual

1) Fuel oil management plan (including bunkering procedures, sampling procedures, change-over procedures and safety aspects related to switch from heavy fuel oil to marine gas oil).

2) Ballast water management plan.

3) Biofouling management plan (for CLEAN DESIGN only).

4) Sewage management plan (including piping diagram of the sewage system, sewage discharge log and capacity calculation of holding tank(s) for sewage and grey water).

5) Refrigerant management plan (including piping diagram of the refrigeration and air conditioning systems, data sheets of the refrigerants used and data sheets for extinguishing media in the fire fighting systems).
6) Bilge water and sludge management plan including maintenance manual (for CLEAN DESIGN only).
7) Garbage management plan.
8) Monitoring procedures and template of the oil consumption log for oil/water interfaces.
SECTION 3 ADDITIONAL REQUIREMENTS FOR THE QUALIFIER DESIGN

A. Introduction

A 100 General

101 The rules in this section give requirements for reducing emissions to air and limiting discharges to sea similar to or more stringent than those described in Section 2 A100. In addition, certain aspects of the design of the vessel are prescribed.

All vessels must comply with the requirements in Section 2, unless specifically required otherwise by this section.

102 For vessels complying with the requirements in this section the qualifier DESIGN will be added to the class notation CLEAN (meaning CLEAN DESIGN).

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.

B 200 Cargo evaporation

201 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).

202 In order to reduce the amount of VOC generated, tankers fitted with mast risers for release of cargo vapour during loading shall be provided with means to maintain an overpressure in cargo tanks during loading. The same or a similar system shall be provided to maintain an overpressure and reduce the need for manual pressure release on laden voyage.

The system shall consist of an in-line automatic pressure control valve arranged in a by-pass to the mast riser isolation valve. The automatic pressure control valve and by-pass shall have the same capacity as required for the common cargo tank venting/inert gas piping system to which it is connected and be so designed that the individual P/V-valves for each cargo tank do not open when the in-line pressure control valve is activated.

Unless the maximum loading rate takes into account the setting of the in-line pressure control valve, it shall be provided with lockable means of closing when loading with vapour return to shore. The setting of the in-line pressure control valve shall be marginally below the setting of the individual P/V-valves fitted to each cargo tank, but not more than 0.03 bar below such a setting. The in-line pressure control valve shall have a low blow-down, i.e. the lowest pressure after opening (including closing pressure) shall not be more than 0.03 bar below the opening pressure.

203 For tankers provided with a vapour recovery process system, the in-line pressure control valve capacity may be designed for release of vapour during laden voyage only.

Guidance note:
The in-line automatic pressure control valve can be of power operated pressure control type, mechanical type (e.g. weight loaded) or similar.

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B 300 Refrigerants

301 Refrigerants used shall be either natural refrigerants (e.g. NH3 or CO2), or alternatively an HFC complying with:

GWP ≤ 2000 and ODP = 0.

Guidance note:
The GWP values from the IPCC Fourth Assessment Report or latest IPCC publication shall be used.
As an alternative to GWP ≤ 2000 documented equivalent total equivalent warming impact (TEWI) may be accepted.

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---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---
B 400  Fire fighting substances

401  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 < 2000
ODP = 0.

Guidance note:
The GWP values from the IPCC Fourth Assessment Report or latest IPCC publication shall be used.

---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---

B 500  Shipboard incinerators

501  An incinerator for burning oil sludge and solid waste shall be installed onboard unless the vessel will have enough capacity for 100% delivery to shore.

Guidance note:
The amount of domestic, operational and cargo waste can be based on the following table:

<table>
<thead>
<tr>
<th>Domestic and operational waste</th>
<th>Cargo associated waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>All types of vessels</td>
<td>Bulk carriers/Obo-carriers</td>
</tr>
<tr>
<td></td>
<td>Container vessels</td>
</tr>
<tr>
<td></td>
<td>Ferries</td>
</tr>
<tr>
<td></td>
<td>General cargo vessels and OSV</td>
</tr>
<tr>
<td></td>
<td>Reefers</td>
</tr>
<tr>
<td></td>
<td>Tankers</td>
</tr>
<tr>
<td>3.0 kg/person/day</td>
<td>8.2 kg/day</td>
</tr>
<tr>
<td></td>
<td>1.4 kg/day</td>
</tr>
<tr>
<td></td>
<td>2.0 kg/person/day</td>
</tr>
<tr>
<td></td>
<td>49.3 kg/day</td>
</tr>
<tr>
<td></td>
<td>22.2 kg/day</td>
</tr>
<tr>
<td></td>
<td>0.01 kg/day</td>
</tr>
</tbody>
</table>

---e-n-d---of---g-u-i-d-a-n-c-e---n-o-t-e---

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  Vessels with class notation Tanker for Chemicals shall have integral tanks, type a2 or independent tanks complying with Pt.5 Ch.4 Sec.1 E400 to E600.

103  Vessels with class notation Tanker for Oil with the deadweight of less than 5000 tonnes shall as a minimum have a double skin arrangement in the cargo area complying with the dimensions given in MARPOL, Annex I, Reg. 19.6. Single skin cargo wing tanks are not accepted.

104  Hull arrangement including cargo tanks for other vessels carrying oil-containing liquids in bulk shall comply with requirements in D100.

Guidance note:
This applies to e.g. supply vessels and other vessels carrying fuel oils and oil-based mud.

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C 200  Cargo handling

201  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>
<thead>
<tr>
<th>Table C1 Cargo deck gutter plates, minimum heights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessels greater than 100 000 tonnes DW forward of 0.2 L: 0.25 m</td>
</tr>
<tr>
<td>Vessels greater than 100 000 tonnes DW aft end: 0.30 m</td>
</tr>
<tr>
<td>Vessels smaller than 100 000 tonnes DW forward of 0.2 L: 0.10 m</td>
</tr>
<tr>
<td>Vessels smaller than 100 000 tonnes DW aft end: 0.30 m</td>
</tr>
</tbody>
</table>
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.

C 300 Arrangements for fuel oil bunkering and other oil filling systems

301 The high level alarm requirements given at Sec. 2 C301 shall be applied to lubricating oil, hydraulic oil and other oil filling tanks as well.

302 Tanks with no risk of causing environmental contamination due to overfilling do not need to comply with 301 and 302. Typically this applies to those small internal tanks which will be filled up locally from oil drums or their overflow vent pipes end up in engine room area.

303 Refuelling stations for helicopter or auxiliary vessels such as life boats, tenders or rescue boats shall be provided with arrangements whereby fuel spillage may be collected and drained to a safe location.

304 Spill/drip trays for oil bunkering arrangements shall be fitted with closed drainage to a deck collecting tank or a sludge tank. If the spill/drip tray is combined with the cargo manifolds area, this requirement is not applicable.

305 The fuel sampling equipment and procedures shall comply with the IMO guidelines for sampling, Res. MEPC.182(59).

C 400 Ballast water and biofouling


402 Vessels shall be provided with a biofouling management plan approved in accordance with MEPC.207(62).

C 500 Bilge water and oil residues (sludge)

501 All parts of the bilge water system and sludge system, including pipes, valves, pumps and oil water filtering/separating equipment shall be fitted with labels/colour codes in order to easily identify the different piping systems in accordance with ISO 14726:2008.

502 The bilge alarm shall be calibrated every 2.5 years at IOPP or Class Certificate intermediate and renewal surveys and set to 5 ppm. Calibration Certificate for 5 ppm bilge alarm shall be available onboard for inspection all the time.

503 Bilge water separator and bilge alarm combined with an automatic stopping device shall be provided for all vessels irrespective of size in a way that no overboard effluent contains more than 5 ppm of oil products and oil burning contaminants.

504 Procedures for handling drainages from machinery spaces and other spaces where the oil contaminated water may be present, such as thruster rooms, steering gear rooms, pump-rooms and spaces containing hydraulic power packs shall be included in bilge water and sludge management plan.

Guidance note:
For tankers, oily water transferred to slop tanks (subject to requirements to prevention of backflow of cargo vapour) may be discharged overboard through the ODME.

505 The effluent for the 5 ppm bilge alarm should be capable of being returned to the bilge water tank (recycling line).

506 The minimum total capacity of the bilge water tank(s) shall be as given in Table C1.

<table>
<thead>
<tr>
<th>Table C1 Capacity of bilge water tanks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main engine rating (kW)</strong></td>
</tr>
<tr>
<td>Up to 1000</td>
</tr>
<tr>
<td>Above 1000 up to 20 000</td>
</tr>
<tr>
<td>Above 20 000</td>
</tr>
</tbody>
</table>

P = main engine rating in kW
For non-conventional propulsion systems (e.g. diesel-electric propulsion) without main engines, P can be considered as sum of the all auxiliary engines or the heaviest loading condition (e.g. normal sea going condition, dynamic positioning, etc.).

For ships adopting IBTS and having Statement of Fact for compliance with MEPC.1/Circ.511, the required capacity of oily bilge water tanks may be reduced.
Bilge system of the vessel shall contain Bilge Settling tank in addition to Bilge Holding tank. Means for surface decanting leading through a hopper into the sludge tank shall be provided.

Separate tank(s) shall be provided for the collection of washing water used for soot cleaning of boilers and economizers. The water inlets to the tanks shall be provided with soot collecting filter bags or equivalent arrangement. The tanks shall be provided with piping connections as follows:

- for direct discharge to reception facility
- for transfer of surface soot and oily surface to a sludge tank or equivalent
- for transfer of settled clean water to bilge holding tank or bilge settling tank
- for discharge of settled clean water overboard.

If overboard effluent through 5 ppm bilge alarm come from multiple sources (Bilge Water Separator, Processed Clean Bilge Water Pump, etc.) then interlock shall be provided for all these sources in such a way that only one source is able to discharge overboard at one time.

All vessels shall be arranged with collecting tanks and systems for handling oil residues including sludge, waste oil, drain oil etc. (oil residue/sludge tank) in accordance with general requirements of Pt.4 Ch.6 Sec.8 A.

The oil being discharged from the oil water separator shall be directed to an oil residue (sludge) tank.

In case any of the sludge tanks is used for evaporation of water in oil residue by means of heating, it shall be fitted with exhaust fan for ventilating the water vapour.

The sludge tanks should be below the heavy fuel oil and lubricating oil purifiers, if installed. The pipelines from purifiers should, wherever possible, be straight or fitted with a large radius elbow. Drain lines from sludge tanks below purifiers to the bilge tank (or, as an alternative, to the sludge tank) shall be provided with self-closing valves and hoppers.

Drain oil shall be collected through fixed drainage arrangement directly to the sludge tanks. If necessary a sludge transfer pump may be used to pump the drain oil to the sludge tank. Drip trays and coamings of sufficient height shall be provided under all equipment where oil spill may be present, such as diesel engines, burners, hydraulic motors, pumps, heaters, coolers, filters and tanks in order to contain spillage of oil.

The drip trays and coamings for equipment not fitted with closed drainage to the sludge tanks shall be collected in the oil residue collecting tank and this emptying procedure shall be incorporated into the Bilge Water and Sludge Management Plan.

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

Food waste, in any form, shall not be discharged into a vessel’s sewage treatment plant. It is required that ground food waste to be directed to a holding tank when the vessel is operating within an area where discharge is prohibited. If any design can show that systems can handle black/grey water contaminated with ground food, it will be acceptable as alternative to the discharge into a vessel’s sewage treatment plant.

Vessels 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.

The vessel shall be provided with holding tanks for sewage with facilities for delivery ashore. The tanks shall have sufficient capacity for the number of persons onboard and for the anticipated time of port stay. For estimating necessary tank capacity a minimum wastewater volume of 70 litres/day/person shall be used. For vessels using vacuum systems, a minimum wastewater volume of 25 litres/day/person shall be used. The duration of port stay shall not be assumed less than 4 days.

Ballast tanks are not allowed to be used as holding tanks for treated sewage. In no case shall ballast tanks be used as holding tanks for untreated sewage.

Sewage system ventilation pipes shall be independent from other ventilation piping systems.

Drain from the galley shall be fitted with a grease trap. For vessels where the total number of crew and passengers normally are more than 30, drain from the galley shall be fitted with a grease trap, connected to the sludge tank or other suitable collecting tank.

In cases of long distances between the grease trap and the sludge tank, heat tracing and adequate slope shall be provided.
All vessels shall have procedures included in the Garbage Management Plan for how the grease trap is emptied, either to the sludge/collecting tank and/or sent ashore.

**C 800 Grey water**

Grey water shall be treated in the vessel's sewage treatment plant(s) unless the vessel treats grey water with a system that meets the following standard:

1. The discharge must satisfy the minimum level of effluent quality specified in USCG 40 CFR §133.102;
2. The geometric mean of the samples from the discharge during any 30-day period may not exceed 20 fecal coliform/100 millilitres (ml) and not more than 10% of the samples may exceed 40 fecal coliform/100 ml; and
3. Concentrations of total residual chlorine may not exceed 10.0 micrograms per litre ($\mu$g/l).

**Guidance note:**
Reference to US Environmental Protection Agency’s Vessel General Permit 2013 Part 5.1.1.1.2.

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The vessel shall be provided with holding tanks for grey water. The tanks shall have sufficient capacity for the number of persons onboard and for the anticipated time of port stay. For estimating necessary tank capacity a wastewater volume of 110 litres/day/person may be used. The duration of port stay shall not be assumed less than 4 days.

Ballast tanks are not allowed to be used as holding tanks for grey water. Combined treated sewage and grey water holding tanks are accepted.

Dedicated sewage and grey water holding tank(s) shall be fitted with high level alarm.

**C 900 Oil/water interfaces**

Requirements to monitoring and control of oil/water interfaces given in Sec.2 C800 shall be complied with, unless the requirements as listed in 1000 are fulfilled.

**C 1000 Stern tube lubricant and seal design**

For stern tubes, other than water lubricated, the design of the stern tube seal is to ensure that the lubricant cannot get in contact with water.

If a “biodegradable” oil is used, an arrangement shall be in place to keep the water content of the oil under control and it shall be ensured that seal materials are compatible with the “biodegradable” oil.

If conventional lube oil is used, an effective, monitored double barrier seal system shall be in place to safeguard against oil leaks to the sea.

All relevant drawings documenting the installation of lubricated stern tube arrangement shall be submitted for approval.

**D. Construction and design**

**D 100 Oil tank protection**

The requirements in 100 and 200 apply to tanks for fuel oil, lubricating oil, hydraulic oil and waste oil (sludge), including overflow tanks. Tanks with capacity below 10 m$^3$ can be located in the double bottom provided that the total capacity of these unprotected tanks will be less than 40 m$^3$.

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

A reduction of the required height of the double bottom under the sump tank under the main engine(s) is acceptable, if motivated by the technical design.

Individual tanks shall not have a capacity of over 1500 m$^3$.

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

$h = 2.0$ m, whichever is the lesser.

The minimum value of $h = 0.76$ 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.
Guidance note:
For semi-submersible offshore units, it is acceptable to use B as the breath of pontoon 1+2, i.e. $B = B_{p1} + B_{p2}$.

105 For vessels having an aggregate oil tank capacity below 5000 m$^3$ 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:

$$w = 0.4 + 2.4 \frac{C}{20000} \text{ m}$$

Where $C$ is the vessels total volume of fuel oil tanks, in m$^3$, at 98% tank filling.

The minimum value of $w = 1.0$ m, however for individual tanks with an oil capacity of less than 500 m$^3$ the minimum value is 0.76 m.

106 For vessels with an aggregate oil tank capacity of 5000 m$^3$ 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:

$$w = 0.5 + \frac{C}{20000}$$

or

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

The minimum value of $w = 1.0$ m.

Where $C$ is the vessels total volume of fuel oil tanks, in m$^3$, at 98% tank filling.
107 Combined fuel oil and water ballast tanks shall not be arranged.

108 The skeg is not to be considered as offering protection for the oil tanks.

109 For the area within the skeg's width the distance “h” is to be measured perpendicular to a line parallel to the baseline at the intersection of the skeg and the moulded line of the bottom shell plating as indicated in Fig.3.

![Fig. 3](image1)

110 For vessels designed with a permanent trim, the baseline should not be used as a reference point. The distance “h” should be measured perpendicular to the moulded line of the bottom shell plating at the relevant frames where fuel tanks are to be protected.

111 For vessels designed with dead rising bottom, the distance “1.5 h” should be measured from the moulded line of the bottom shell plating but at right angle to the baseline, as indicated in Fig.4.

![Fig. 4](image2)

D 200 Sundry

201 Lines of oil piping located at a distance from the vessel's bottom less than h, as defined in 103, or from the vessel'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 0.5 h.
D 300 Oil residue - sludge tanks

301 Sludge tanks shall be fitted with heating arrangements to facilitate the pump-ability and discharge of the tank content.

Guidance note:
This is applicable to ships operating with HFO, MDO and MGO but may not be applied to gas-fuelled ships.

---e-n-d-o-f---g-u-i-d-a-n-c-e---n-o-t-e---

302 Sufficient man-holes should be provided such that, taking into consideration the internal structure of the oil residue (sludge) tanks, all parts of the tank can be reached to facilitate cleaning.

E. Other aspects

E 100 Ship recycling

101 All vessels shall hold and maintain an Inventory of Hazardous Materials as required by the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Vessels (SR/CONF/45) and any subsequent additions or amendments hereto adopted at the relevant time. The inventory of hazardous materials shall be prepared using the most recent adopted MEPC Resolutions.

Vessels shall hold class notation RECYCLABLE (See Ch.27) to fulfil this requirement or Statement of Compliance for Inventory of Hazardous Materials may be accepted as an equivalence to class notation RECYCLABLE.

Guidance note:
For NB projects, if prior to delivery, IHM is ordered to be developed and certified according to ships in operation procedure, this requirement is fulfilled and RECYCLABLE shall be assigned prior to next renewal survey.

---e-n-d-o-f---g-u-i-d-a-n-c-e---n-o-t-e---
CHANGE – HISTORIC

Note that historic changes older than the editions shown below have not been included. Older historic changes (if any) may be retrieved through http://www.dnvgl.com.

January 2014 edition

Main changes January 2014, entering into force 1 July 2014

- General
  The chapter has been completely rewritten. In addition to a general clean-up of language and layout, the changes include:
  - requirements to mandatory notations
  - the new qualifier DESIGN Tier III has been introduced.
  - removal of requirements that are already addressed and mandatory through MARPOL
  - requirements to “CLEAN class manual” have been introduced.

January 2013 edition

Main changes coming into force 1 July 2013

- Sec.3 Class Notation CLEAN DESIGN
  - Sub-section element C1100 “Stern tube bearing lubricants and seal design” has been revised to clarify the technologies which can be used.
  - In item E101, the reference to Guidelines Resolution MEPC. 179(59) has been changed to MEPC. 197(62).