RUSSIAN MARITIME REGISTER OF SHIPPING

Electronic version of printed document
approved on 18.11.10

RULES

FOR THE PREVENTION OF POLLUTION FROM SHIPS INTENDED FOR OPERATION IN SEA AREAS AND INLAND WATERWAYS OF THE RUSSIAN FEDERATION

ND No. 2-020101-063

Saint-Petersburg
2010

The Rules for the Prevention of Pollution from Ships Intended for Operation in Sea Areas and Inland Waterways of the Russian Federation (hereinafter referred to as "the Rules") have been approved in accordance with the established approval procedure and come into force since 1 December 2010.

The Rules have been developed taking into account the requirements of the RF Administration normative documents with regard to prevention of pollution of inland waterways from ships, of the current national standards regulating emission of polluting substances from marine diesel engines under operating conditions, as well as of the international normative documents for prevention of pollution from ships considering the amendments and additions developed immediately before republication.

ISBN 978-5-89331-121-1

CONTENTS

PART I. REGULATIONS FOR TECHNICAL SUPERVISION

PART II. SHIP'S CONSTRUCTION, EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF POLLUTION BY OIL

PART III. SHIP'S CONSTRUCTION, EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF POLLUTION BY NOXIOUS LIQUID SUBSTANCES IN BULK

PART IV. SHIP'S EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF POLLUTION BY SEWAGE

PART V. SHIP'S EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF POLLUTION BY GARBAGE

PART VI. SHIP'S EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF AIR POLLUTION

PART I. REGULATIONS FOR TECHNICAL SUPERVISION

1 GENERAL

1.1 SCOPE OF APPLICATION

1.1.1 The present Rules apply to the ships intended for operation in sea areas and inland waterways of the Russian Federation[1], flying the flag of the Russian Federation and classed by the Russian Maritime Register of Shipping[2], as well as to the shipboard equipment.

1.1.2 The requirements of the Rules apply to the ships under construction, which technical designs are submitted to the Register for review after the Rules coming into force.

1.1.3 The Rules requirements apply to the ships in service as stipulated in the text of the Rules.

1.2 DEFINITIONS

1.2.1 Definitions and explanations pertinent to the general terminology of the Rules are given in Part I "Classification" of the Rules for the Classification and Construction of Sea-Going Ships.

For the purpose of the present Rules, the following definitions have been adopted.

R F A d m i n i s t r a t i o n means the Government of the Russian Federation, under whose authority the ship is operating.

I n l a n d w a t e r w a y s means natural or man-made inland federal communication lines provided with navigational marks or other means and used for shipping.

H a r m f u l s u b s t a n c e means any substance, which, if introduced into water, is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the aquatic environment.

[1] Hereinafter referred to as "the RF".

[2] Hereinafter referred to as "the Register".

IMO means the International Maritime Organization.

IBC Code means the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.

MARPOL 73/78 means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 relating thereto, including amendments adopted by the IMO Marine Environment Protection Committee.

Similar stage of construction means the stage at which:

construction identifiable with a specific ship has begun; and

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

Discharge, in relation to harmful substances or effluents containing such substances, means any release howsoever caused from a ship and includes any escape, disposal, spilling, leakage, pumping, emitting or emptying.

Discharge does not include:

dumping within the meaning of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972; or

release of harmful substances directly arising from the exploration, exploitation and associated offshore processing of sea-bed mineral resources; or

release of harmful substances for purposes of legitimate scientific research into pollution abatement or control.

Ship means a vessel of any type or purpose operating in sea areas and inland waterways.

NO_x Technical Code means the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines.

2 SURVEYS

2.1 TYPES OF SURVEYS

2.1.1 Equipment for the prevention of pollution (by oil, noxious liquid substances in bulk, sewage, garbage, as well as of air pollution) from the ships specified in 1.1.1 is subject to surveys in accordance with the applicable provisions of Section 19, Part V "Technical Supervision during Construction of Ships" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships, and Sections 8 to 11, Part III "Survey of Ships in Compliance with International Conventions, Codes and Resolutions" of the Guidelines on Technical Supervision of Ships in Service.

2.1.2 Upon satisfactory results of initial survey of a ship or survey for renewal of a Pollution from Ships Prevention Certificate (form 2.4.18) the Register issues this Certificate to any ship specified in 1.1.1 so that it could operate in the RF sea areas and inland waterways.

2.2 SCOPE OF SURVEYS

2.2.1 The scope of surveys and intervals between them are given in Table 2.2.1.

Table 2.2.1

Symbols:
O — examination with provision of measures to enable the items involved to be made accessible for examination, to be opened up and dismantled, if necessary;
C — external examination;
M — measurements of wear, clearances, insulation resistance, etc;
H — pressure tests (hydraulic, pneumatic);
P — testing of machinery, equipment and arrangements under working conditions, external examination included;
E — control of availability of documents in force and/or brands confirming the checking of monitoring instruments by the relevant competent bodies, if they are subject thereto, as well as availability of a Bilge Alarm Calibration Certificate.

Nos.	Item of survey	Ship survey			
		initial	annual	inter-mediate	special
1 Equipment and arrangements for the prevention of pollution by oil					
1.1	Tanks (segregated ballast, slop, cargo and holding tanks)	OH			OMH
1.2	Bilge separator	OP[1]	P[1]	P[1]	OMHP[1]
1.3	Bilge alarm	EMP	MP	MP	EMP
1.4	Safety valves	P	P	P	OP
1.5	Pumping and discharge arrangements for oily bilge waters	OHP	P	P	OHP
1.6	Pumping and discharge arrangement for oil residues (sludge)	OHP	P	P	OHP
1.7	Instrumentation	E	E	E	E
2 Equipment and arrangements for the prevention of pollution by noxious liquid substances in bulk					
2.1	Tanks (segregated ballast, slop and cargo tanks)	OH			OMH
2.2	Pumps, pipelines, arrangements for cargo unloading and tank stripping	OP	P	P	OMP
2.3	Ventilation equipment for removal of cargo residues	OMP	P	P	OMP
2.4	Tank washing equipment	OHP	P	P	OHP
2.5	Instrumentation	E	E	E	E
3 Equipment and arrangements for the prevention of pollution by sewage					
3.1	Sewage treatment plants	OHP[2]			OMHP[2]
3.2	Sewage comminution and disinfection systems	OHP			OMHP
3.3	Holding tanks	OH			OMH
3.4	Sewage discharge systems	OHP			OHP
3.5	Instrumentation	E			E
4 Equipment and arrangements for the prevention of pollution by garbage					
4.1	Incinerators	OP	P	P	OMP
4.2	Garbage comminuters and compactors	OP	P		OP
4.3	Garbage receptacles and storages	C	C		C
4.4	Instrumentation	E	E		E

Table 2.2.1 — continued

Nos.	Item of survey	Ship survey			
		initial	annual	inter-mediate	special
5 Equipment and arrangements for the prevention of air pollution					
5.1	Engines covered by provisions in 2.2.1, Part VI "Ship's Equipment and Arrangements for the Prevention of Air Pollution"	OMP	OM	OM	OM
5.2	System for change-over of engines to fuel oil with low sulphur content	OP	P	P	OP
5.3	Exhaust gas cleaning system for reduction of SO_x emissions (EGCS-SO_x)	OMP	P	P	OMP
5.4	Volatile organic compounds vapours collection system	OP	P	P	OP
5.5	Incinerators	OP	P	P	OMP
5.6	Instrumentation	E	E	E	E

[1] At annual surveys, the results of the sample analysis carried out by a recognized laboratory shall be submitted. At initial and special surveys, the sampling shall be witnessed by the Surveyor to the Register with subsequent submission of the results of the sample analysis carried out by a recognized laboratory.

[2] Conclusion of the state sanitary authorities shall be submitted to confirm the compliance of the plants with the sanitary standards and requirements.

3 TECHNICAL DOCUMENTATION

3.1 During surveys of ships for compliance with the requirements of the Rules, availability on board ship of all the documentation required according to Section 19, Part V "Technical Supervision during Construction of Ships" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships (whichever is applicable) shall be checked.

In addition to the above, it is necessary to check availability on board the ship of the following documentation:

.1 approved documentation on operational procedures and ballast arrangements for oil tankers having special ballast arrangements, if applicable;

.2 Prompt Access System to Computerised, Shore-Based Damage Stability and Residual Structural Strength Calculation Programs User Manual, Agreement with the Shore Center of Damage Stability and Residual Structural Strength Calculations, as well as the copy of a Certificate of Firm Conformity (form 7.1.27) of this shore center (for oil tankers of 5000 t deadweight and above);

.3 approved EGCS-SO_x Operating Manual (scheme A), if applicable;

.4 approved EGCS-SO_x Operating Manual (scheme B), if applicable;

.5 copy of a SO_x Emission Control Area (SECA) Compliance Certificate (Certificate on Approval of Arrangement of Exhaust Gas Cleaning System (if applicable);

.6 approved Onboard Monitoring Manual (OMM) (if applicable);

.7 approved SO_x Emission Control Area (SECA) Compliance Plan (when EGCS-SO_x is used);

.8 procedures for operations on preparation of the ship's fuel oil system for running on low sulphur fuel oil with sulphur content according to 2.3.2, prior to entry into inland waters, as well as into the SOx Emission Control Areas, and the relevant Log-book of Fuel Oil Change-Over for recording the volume of low sulphur fuel oil in each tank, as well as the date, time and position of the ship when any fuel-oil-change-over operation is completed;

.9 Vapour Discharge System Operating Instruction (VOC) (for oil tankers, if applicable);

.10 VOC Management Plan (for oil tankers carrying crude oil, if applicable);

.11 programmes and test results for determination of a quantity of residues in cargo tanks, pumps and associated piping on ships certified to carry noxious liquid substances in bulk.

3.2 At special, annual and intermediate surveys of ships for compliance with the requirements of the Rules, the availability on board ship of the documentation according to 3.1 shall be checked, as well as of the following documentation:

.1 Statement of Compliance according to provisions of condition assessment scheme (CAS) (for oil tankers, if applicable);

.2 full set of previous survey reports, including measurement results of hull members, records of repairs, as well as CAS Survey Reports (if applicable);

.3 Record Books of Engine Parameters for the engines covered by the requirements of the Rules;

.4 bunker delivery notes.

PART II. SHIP'S CONSTRUCTION, EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF POLLUTION BY OIL

1 DEFINITIONS

1.1 In the present Part of the Rules the following definitions have been adopted.

W i n g t a n k means any tank adjacent to the ship's side shell plating.

L i g h t w e i g h t means the displacement of a ship in metric tons without cargo, fuel, lubricating oil, ballast water, fresh water and feed water in tanks, consumable stores, and passengers and crew and their effects.

D e a d w e i g h t *DW* means the difference in tones between the displacement of a ship in water of a relative density of 1,025 t/m^3 at the load waterline corresponding to the summer freeboard and the lightweight of the ship.

L e n g t h *L* means 96 per cent of the total length on a waterline at 85 per cent of the least moulded depth measured from the top of the keel, or the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that be greater. In ships designed with a rake of keel the waterline on which this length is measured shall be parallel to the designed waterline. The length *L* shall be measured in meters.

A n n i v e r s a r y d a t e means the day and the month of each year, which will correspond to the date of expiry of the International Oil Pollution Prevention Certificate.

F u e l o i l means heavy distillates or residues from crude oil or blends of such materials intended for use as a fuel for the production of heat or power of a quality equivalent to the specifications acceptable to IMO.

S e g r e g a t e d b a l l a s t means the ballast water introduced into a tank which is completely separated from the cargo oil and fuel oil system and which is permanently allocated to the carriage of ballast or to the carriage of ballast or cargoes other than oil or noxious liquid substances.

C o m b i n a t i o n c a r r i e r means a ship designed to carry either oil or solid cargoes in bulk.

I n s t a n t a n e o u s r a t e o f d i s c h a r g e o f o i l c o n t e n t means the rate of discharge of oil in litres per hour at any instant divided by the speed of the ship in knots at the same instant.

Amidships is at the middle of the length *L*.

Oil tanker means a ship constructed or adapted primarily to carry oil in bulk in its cargo spaces and includes combination carriers, any "NLS tanker" as defined in Part III "Ship's Construction, Equipment and Arrangements for the Prevention of Pollution by Noxious Liquid Substances in Bulk" of the Rules, and any gas carrier as defined in regulation 3.20 of Chapter II-1 of SOLAS-74 (as amended), when carrying a cargo or part cargo of oil in bulk.

Crude oil tanker means an oil tanker engaged in trade of carrying crude oil.

Oil tanker delivered before 6 July 1996 means an oil tanker:

for which the building contract was placed before 6 July 1993; or

in the absence of a building contract, the keel of which was laid or which was at a similar stage of construction before 6 January 1994; or

the delivery of which was before 6 July 1996; or

which has undergone a major conversion on the date of placing the contract or beginning the construction work, or completing that work, or before these dates corresponding to the above dates during the construction accordingly.

Oil tanker delivered on or after 6 July 1996 means an oil tanker:

for which the building contract was placed on or after 6 July 1993; or

in the absence of a building contract, the keel of which was laid or which was at a similar stage of construction on or after 6 January 1994; or

the delivery of which was on or after 6 July 1996; or

which has undergone a major conversion on the date of placing the contract or beginning the construction work, or completing that work, or after these dates corresponding to the above dates during the construction accordingly.

Oil tanker delivered on or after 1 January 2010 means an oil tanker:

for which the building contract was placed on or after 1 January 2007; or

in the absence of a building contract, the keel of which was laid or which was at a similar stage of construction on or after 1 July 2007; or

the delivery of which was on or after 1 January 2010; or

which has undergone a major conversion on the date of placing the contract or beginning the construction work, or completing that work, or after these dates corresponding to the above dates during the construction accordingly.

Product carrier means an oil tanker engaged in the trade of carrying oil other than crude oil.

Oily mixture means a mixture with any oil content.

Oily waste means oil sludge and oily bilge water.

Oil means petroleum in any form including crude oil, fuel oil, oil residues (sludge), oil refuse and refined products.

Heavy grade oil means any of the following:

crude oils having a density at 15 °C higher than 900 kg/m^3;

oils, other than crude oils, having either a density at 15 °C higher than 900 kg/m^3 or a kinetic viscosity at 50 ºC higher than 180 mm^2/s; or

bitumen, tar and their emulsions.

Oil fuel means any oil used as fuel in connection with the propulsion and auxiliary machinery of the ship in which such oil is carried.

Sludge means part of oil, which due to its consistence is not liable to conventional pumping or processing and requires special methods and devices for disposal from the ship.

Oil residues (sludge) means separated sludge, exhausted lubricating oil, oil from bilge water separators, leakages of fuel and lubricating oil.

Forward and after perpendiculars shall be taken at the forward and after ends of the length *L*. The forward perpendicular shall coincide with the foreside of the stem on the waterline on which the length is measured.

Volumes and areas in a ship shall be calculated in all cases to moulded lines.

Exhausted oil means exhausted lubricating oil, hydraulic oil or other hydrocarbon based liquids, which are not suitable for use in machinery due to deterioration and contamination.

Separated sludge means sludge resulting from purification of fuel and lubricating oil.

Slop tank means a tank specifically designated for the collection of tank drainings, tank washings and other oily mixtures.

Constructed ship means a ship the keel of which is laid or which is at a similar stage of construction.

Bilge separator may include any combination of a separator, filter or coalescer, and also a single unit designed to produce an effluent with oil content as required.

Bilge alarm means a device giving off a signal whenever the oil content in the effluent exceeds the required standards.

Ship delivered on or before 31 December 1979 means a ship:

for which the building contract was placed on or before 31 December 1979; or

in the absence of a building contract, the keel of which was laid or which was at a similar stage of construction on or before 30 June 1976; or

the delivery of which was on or before 31 December 1979; or

which has undergone a major conversion on the date of placing the contract, or beginning the construction work, or completing that work, or before these dates corresponding to the above dates during the construction accordingly.

Ship delivered after 31 December 1979 means a ship:

for which the building contract was placed after 31 December 1979; or

in the absence of a building contract, the keel of which was laid or which was at a similar stage of construction after 30 June 1976; or

the delivery of which was after 31 December 1979; or

which has undergone a major conversion after the date of placing the contract, or beginning the construction work, or completing that work, corresponding to the above dates during the construction accordingly.

Crude oil means any liquid hydrocarbon mixture occurring naturally in the earth whether or not treated to render it suitable for transportation and includes:

crude oil from which certain distillate fractions may have been removed;

crude oil to which certain distillate fractions may have been added.

Tank means an enclosed space, which is formed by the permanent structure of a ship and which is designed for the carriage of liquid in bulk.

Bilge water tank means a tank for accumulating oily bilge water.

Oil residues (sludge) tanks mean the following tanks:

sludge tanks;

tanks for collecting fuel and lubricating oil leakages;

tanks for collecting exhausted oil.

Centre tank means any tank inboard of a longitudinal bulkhead.

Breadth *B* means the maximum breadth of the ship, measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material. The breadth *B* is measured in meters.

Sludge tanks mean tanks for accumulating sludge after fuel and lubricating oil separation.

2 SURVEYS AND SCOPE OF TECHNICAL SUPERVISION

2.1 The types and scope of surveys, as well as the guidelines on the documents issued by the Register are given in Part I "Regulations for Technical Supervision".

3 REQUIREMENTS FOR OIL TANKERS

3.1 SEGREGATED BALLAST TANKS

3.1.1 Oil tankers may be provided with segregated ballast tanks.

3.1.2 The amount and the arrangement of segregated ballast in oil tankers shall ensure their safe operation. Draught of any oil tanker of 50 m and more, but less than 150 m in length L shall be not less than the values calculated in accordance with Table 3.1.2. In any case, stability shall be examined separately.

Table 3.1.2

Version	Minimum draught at bow, in m	Minimum draught at stern, in m	Mean draught, in m	Minimum mean draught, in m	Maximum trim, in m
A	—	—	$0{,}2 + 0{,}032L$	—	$(0{,}024 - 6 \cdot 10^{-5}L)L$
B	$0{,}700 + 0{,}0170L$	$2{,}3 + 0{,}030L$	—	$1{,}550 + 0{,}023L$	$1{,}600 + 0{,}013L$
C	$0{,}5000 + 0{,}0225L$	$2{,}0000 + 0{,}0275L$	—	—	—

Notes: A — applied for ships of 50 m to 150 m in length. Therewith, good ballast conditions during sailing in weather up to and including Beaufort scale 5 are provided.

B — good ballast conditions during sailing in weather up to and including Beaufort scale 6 are provided. The formulae of the minimum draught at bow and stern, or the minimum mean draught and minimum trim may be used in calculations.

C — contains certain increased draughts to prevent the propeller emergence and ship's slamming.

3.1.3 Provision may be made for emergency discharge of the segregated ballast by means of a connection to a cargo pump through a portable spool piece.

In this case, non-return valves shall be fitted on the segregated ballast connections to prevent the passage of oil to the segregated ballast tanks. The portable spool piece shall be mounted in a conspicuous position in the pump room and a permanent notice restricting its use shall be prominently displayed adjacent to it.

3.1.4 Segregated ballast tanks shall be provided with independent ballast pumps and pipelines, intended exclusively for the intake of ballast water from the sea and discharge it into the sea.

3.2 CARGO TANKS

3.2.1 Every oil tanker with regard to the limitations of the size and arrangement of cargo tanks, as well as to the pipelines connecting cargo tanks and the pipelines running through the cargo tanks shall meet the applicable requirements in Part II "Hull" and Part XVIII "Common Structural Rules for Double Hull Oil Tankers" of the Rules for the Classification and Construction of Sea-Going Ships, as well as the international requirements applicable to those ships.

3.3 REQUIREMENTS FOR DOUBLE HULL OIL TANKERS

3.3.1 Oil tankers of 600 tones deadweight and above delivered on and after 6 July 1996, as defined in Section 1 of the present Part, shall have double hull and double bottom in compliance with the specified below in 3.3.2 to 3.3.6.

3.3.2 Every oil tanker of 150 m in length and above or of 5000 tones deadweight and above shall comply with the requirements of Part XVIII "Common Structural Rules for Double Hull Oil Tankers" of the Rules for the Classification and Construction of Sea-Going Ships, as well as the applicable international requirements.

3.3.3 Every oil tanker of less than 5000 tones deadweight shall comply with the following requirements:

.1 at any cross-section the depth h of each double bottom tank or space shall be not less than specified below:

$$h = B/15, \text{ in m.} \qquad (3.3.3.1)$$

The minimum value of h = 0,76 m.

At that in turn of the bilge area and at locations without a clearly defined turn of the bilge, the cargo tank boundary line shall run parallel to the line of the midship flat bottom as shown in Fig. 3.3.3.1;

.2 wing tanks or spaces shall extend either for the full depth of the ship's side or from the top of the double bottom to the uppermost deck, disregarding a rounded gunwale where fitted. They shall be arranged such that the cargo tanks

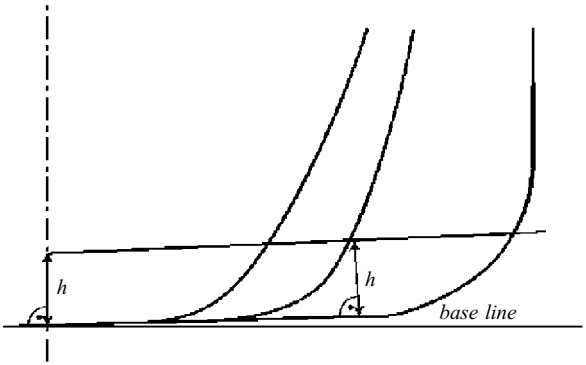

Fig. 3.3.3.1

are located inboard of the moulded line of the side shell plating nowhere less than the distance w which is calculated by the formula given below and, as shown in Fig. 3.3.3.2, is measured at any cross-section at right angles to the side shell:

$$w = 0{,}4 + 2{,}4DW/20000, \text{ in m.} \qquad (3.3.3.2)$$

The minimum value of $w = 0{,}76$ m.

Where the requirement in 3.3.3.2 is not met, the capacity of each cargo tank shall not exceed 700 m^3.

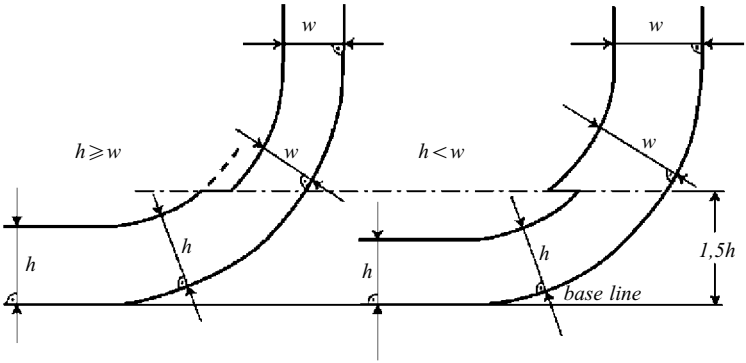

Fig. 3.3.3.2

3.3.4 Every oil tanker of 5000 tones deadweight and above shall comply with the following requirements.

The entire cargo tank length shall be protected by ballast tanks or spaces other than oil or fuel oil tanks as follows:

.1 at any cross-section the depth h of each double bottom tank or space shall be not less than specified below:

$h = B/15$, in m, or (3.3.4.1)

$h = 2$ m, whichever is the lesser.

The minimum value of $h = 1{,}0$ m.

.2 wing tanks or spaces shall extend either for the full depth of the ship's side or from the top of the double bottom to the uppermost deck, disregarding a rounded gunwale where fitted. They shall be arranged such that the cargo tanks are located inboard of the moulded line of the side shell plating nowhere less than the distance w which is calculated by the formula given below and, as shown in Fig. 3.3.3.2, is measured at any cross-section at right angles to the side shell:

$w = 0{,}5 + DW/20000$, in m, or (3.3.4.2)

$w = 2$ m, whichever is the lesser.

The minimum value of $w = 1{,}0$ m.

.3 in turn of the bilge area and at locations without a clearly defined turn of the bilge. When the distances h and w are different, the distance w shall have preference at levels exceeding $1{,}5h$ above the base line, as shown in Fig. 3.3.3.2.

3.3.5 Ballast piping and other piping such as sounding and vent piping to ballast tanks shall not pass through cargo tanks. Cargo piping and similar piping to cargo tanks shall not pass through ballast tanks.

3.3.6 On oil tankers of 5000 tones deadweight and above constructed on or after 1 January 2007, cargo pump rooms shall be provided with the following protective means:

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

$h = B/15$, in m, or (3.3.6.1)

$h = 2$ m, whichever is the lesser.

The minimum value of $h = 1{,}0$ m;

.2 the double bottom, which protects the cargo pump room, may be arranged as a dry or ballast tank;

.3 ballast pumps shall be provided with suitable arrangements to ensure efficient suction from double bottom tanks;

.4 ballast system pipelines may be fitted in the double bottom of cargo pump rooms, provided that any damage to these pipelines shall not affect operation of the cargo system;

.5 in case the pump room bottom or part thereof (refer to cases NO 2 and NO 3 in Fig. 3.3.6.5) is located above the ship's base line (*BL*) by at least the minimum height, as specified in 3.3.6.1, there will be no need for a double bottom construction in way of the pump room or part thereof.

In case the part of the pump room is located below the minimum height, as required in 3.3.6.1, this part of the pump room shall serve as the double bottom protecting the above part of the pump room (refer to cases NO 1 and NO 3 in Fig. 3.3.6.5).

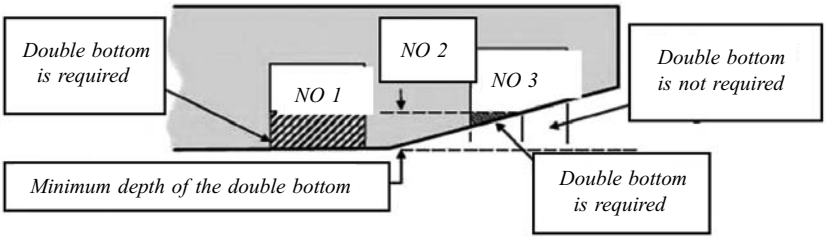

Fig. 3.3.6.5

3.3.7 Suction wells in the double bottom of both cargo tanks and cargo pump rooms shall be as small as practicable, and in this case the distance between the well bottom and the ship's base line measured at the right angle to the ship's base line shall be not less than half the double bottom depth.

4 BILGE SEPARATORS

4.1 GENERAL

4.1.1 Any ship of 400 gross tonnage and above operating in inland waters shall be fitted with a bilge separator (separator) of an approved type, the bilge alarm of an approved type and an automatic stopping device.

4.1.2 Operating in sea areas, any ship of 400 gross tonnage and above shall be fitted with the separator of an approved type, and any ship of 10000 gross tonnage and above shall be fitted with the separator of an approved type, the bilge alarm of an approved type and an automatic stopping device.

4.1.3 Any ship of less than 400 gross tonnage operating in inland waters shall be fitted with the equipment in compliance with 4.1.1 when the necessary endurance of the ship cannot be ensured due to the inadequate volume of holding tanks for oily waters.

4.1.4 In case the ship is operating in inland waterways, the oil filtering equipment shall be of such capacity as will ensure that any oily mixture passing through the system has an oil content not exceeding 10 mg/l (for equipment fitted before 1997) and 8,0 mg/l (for equipment fitted in 1997 or later).

In case the ship is operating only in sea areas, the oil filtering equipment shall be of such capacity as will ensure that any oily mixture passing through the system has an oil content not exceeding 15 mg/l.

4.1.5 If the results of sampling carried out by a recognized laboratory evidence that the equipment specified in 4.1.1 and 4.1.2 does not ensure the oil content in the discharge in compliance with the standards given in 4.1.4, the ship's operation is not allowed until the equipment defects have been eliminated and satisfactory results of sampling obtained.

4.2 TECHNICAL REQUIREMENTS FOR BILGE SEPARATORS

4.2.1 Bilge separators shall comply with the technical requirements according to the provisions of the applicable IMO resolutions.

4.2.2 Bilge separators shall be of a reliable design. Units and parts being subject to periodical inspections and maintenance shall be readily accessible for the personnel. The capacity of bilge separator pump shall be consistent with the throughput of the bilge separator. In any case, the capacity of bilge separator pump shall not exceed more than 1,1 times the throughput of the bilge separator.

4.2.3 Provision shall be made for drainage of the bilge separator.

4.2.4 When the oily mixture shall be heated in the bilge separator, steam or water coils may be used for this purpose. Electric heating is permitted, provided the requirements of 15.3, Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships are met.

4.2.5 The bilge separator shall be so designed that it functions automatically. However, fail-safe arrangements to avoid any discharge in case of malfunction shall be provided.

There shall be no need for any adjustment to valves and other equipment to bring the bilge separator into operation. The equipment should be capable of operating for at least 24 hours of normal duty without attention.

4.2.6 Changing the feed to the bilge separator (from bilge water to oil, bilge water to emulsified bilge water, or from oil and/or water to air) shall not result in the discharge overboard of any mixture with oil content more than specified in 4.1.3.

4.2.7 The bilge separators, pumps and other equipment shall be fitted with pressure, temperature and level gauges, and an alarm and protection system shall be provided.

4.2.8 If a centrifugal separator is incorporated in the bilge separator, it shall meet the requirements of 5.4, Part IX "Machinery" of the Rules for the Classification and Construction of Sea-Going Ships.

4.2.9 Where there is a possibility of oil residues (sludge) leakage, the bilge separators, pumps and other equipment shall be fitted with arrangements for collecting leakages in compliance with the requirements of 13.5, Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships.

4.2.10 In a vertical section of the piping for the discharge of purified water, after the bilge separator, provision shall be made for a sampling arrangement located as close as practicable to the bilge separator outlet. The design of the sampling arrangement shall correspond to the design shown in Fig. 4.2.10.

4.2.11 If any restrictions for operation and/or assembly are introduced, which are deemed necessary by the Register, these shall be put down on a plate attached to the equipment.

4.2.12 The electrical equipment of the bilge separator shall comply with the requirements of Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

4.2.13 Re-circulating facilities shall be provided, after and adjacent to the overboard outlet of the stopping device, to enable the bilge separator, as well as bilge alarm and automatic stopping device, to be tested with the overboard discharge closed.

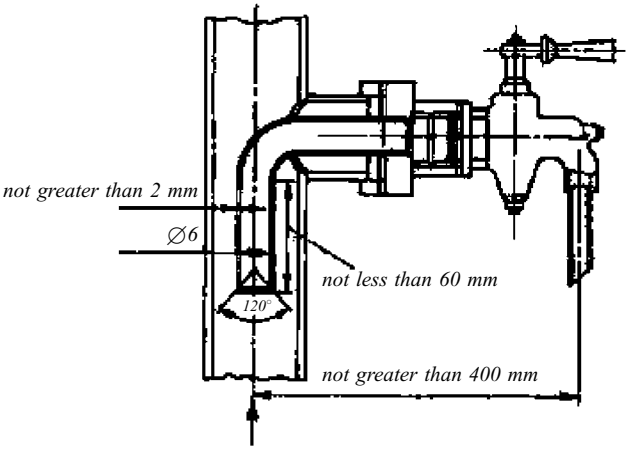

Fig. 4.2.10
Sampling arrangement for pressure piping

4.2.14 The pipelines for discharge of cleaned water after the bilge separator shall not have connections with the bilge water pipeline system, bilge and ballast systems, except for the outlet referred to in 5.2.13 and the recirculation pipeline after automatic stopping device. Re-circulating facilities for oily water shall exclude any by-pass of the bilge separator.

4.2.15 The bilge separator inlet pipelines shall not have any connections with the pipelines of sea water or fresh water systems. The separator pipelines may have connections with the above pipelines for washing purposes in accordance with the approved design of the bilge separator.

4.2.16 Recommended throughput of bilge separators depending on the ship's gross tonnage is given in Table 4.2.16.

Table 4.2.16

Ship's gross tonnage	Recommended throughput of bilge separators, in m^3/h
400 and above, but less than 1600	0,5
1600 and above, but less than 4000	1,0
4000 and above, but less than 15000	2,5
15000 and above	5,0

5 BILGE ALARM

5.1 GENERAL

5.1.1 The bilge alarm of an approved type shall be fitted where separators are installed in compliance with 4.1.1 and 4.1.2.

5.1.2 The ships fitted with the bilge alarm shall be provided with an automatic stopping devices complying with the requirements of Section 6.

5.2 TECHNICAL REQUIREMENTS FOR BILGE ALARM

5.2.1 The bilge alarm design shall comply with the provisions of the applicable IMO resolutions.

5.2.2 The bilge alarm shall resist corrosion in conditions of the marine environment. The bilge alarm shall not contain or use any substances of a dangerous nature, unless adequate arrangements, approved by the Register, are provided to eliminate any hazards introduced thereby.

5.2.3 The bilge alarm shall, if intended to be fitted in locations where flammable atmosphere may be present, comply with the requirements in 2.9, Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships. Any moving parts of the bilge alarm which are fitted in hazardous areas shall be arranged so as to avoid the formation of static electricity.

5.2.4 The bilge alarm shall be capable of reliable performance in climatic conditions and under mechanical effects in accordance with 2.1, Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships.

5.2.5 The response time of the bilge alarm, that is, the time, which elapses between an alteration in the water sample being supplied to the bilge alarm and the display showing correct response, shall not exceed 5 s.

5.2.6 The bilge alarm shall be fitted with an electrical/electronic device, which shall be preset by the manufacturer to activate when the oil content in the effluent exceeds a standard value with simultaneous provision of a command signal to the automatic stopping device to discontinue discharge overboard. The device shall also operate automatically if at any time the bilge alarm shall fail to function, require a warm-up period or otherwise be de-energized.

5.2.7 The bilge alarm shall be designed so that its threshold of action may be set by the manufacturer in accordance with the standards specified in 4.1.3.

If the bilge alarm design does not provide such capability, discharge of oily water through filtering equipment in inland waterways is prohibited and the stop valves in the system for discharge of treated oily waters shall be sealed. In this case all the oily water shall be retained on board in holding tanks for discharge to reception facilities.

5.2.8 It is recommended that a simple means be provided aboard ship to check on the instrument drift and the ability to re-zero the instrument.

5.2.9 The bilge alarm shall record the date, time and alarm status, and also the operating status of the bilge separator. The recording device shall also store data for at least eighteen months and shall be able to display or print a protocol for official inspections as required. In the event the bilge alarm is replaced, means shall be provided to ensure the data recorded remains available on board for 18 months.

5.2.10 To avoid willful manipulation of the bilge alarm, provision shall be made for the following:

.1 every access of the bilge alarm beyond the operations specified in 5.2.8 requires the breaking of a seal; and

.2 the bilge alarm shall be so constructed that the alarm is always activated whenever clean water is used for cleaning or zeroing purposes.

5.2.11 The accuracy of the bilge alarms shall be within $\pm$ 5 ppm and it shall be checked at renewal surveys according to the manufacturer's instructions. The calibration certificate for the bilge alarm, certifying date of the last calibration check, shall be retained on board. Calibration of the bilge alarms may be done by the manufacturers or persons authorized by the manufacturer.

5.2.12 The bilge alarm shall be installed in the ship relative to the bilge separator so that the overall response time (including the response time of the bilge alarm) between an effluent discharge from the bilge separator with the oil content above the standards, specified in 4.1.3, and the operation of the automatic stopping device preventing overboard discharge shall be as short as possible. In any case that time shall not exceed 20 s.

5.2.13 The arrangement on board ship for the extraction of samples from the bilge separator discharge line to the bilge alarm shall give an adequate pressure and flow.

6 AUTOMATIC STOPPING DEVICE

6.1 The automatic stopping devices shall be fitted in the ships specified in 5.1.2 and shall stop any discharge overboard of an oily mixture when the bilge alarm referred to in 6.2 activates.

6.2 The automatic stopping device shall consist of a valve arrangement installed in the effluent outlet line of the bilge separator. The device automatically diverts oily water from being discharged overboard back to the ship's bilges or a bilge water holding tank when the oil content of the effluent exceeds the values specified in 4.1.4.

7 PUMPING, PIPING AND DISCHARGE ARRANGEMENTS FOR OILY MIXTURE

7.1 GENERAL

7.1.1 Oily mixture pumping, piping and discharge arrangements, hydraulic tests of the piping and fittings shall comply with the requirements of Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships.

7.2 REQUIREMENTS FOR OILY MIXTURE TRANSFER AND DISCHARGE SYSTEMS

7.2.1 Oil tankers.

7.2.1.1 Equipment and arrangements for transfer and discharge of oily mixtures from oil tankers, as well as from the ships having cargo spaces, which are constructed and utilized to carry oil of aggregate capacity of 200 m^3 and more, shall include the following:

.1 discharge manifolds for discharge of oily mixtures (dirty ballast water, washing water, etc.) to reception facilities;

.2 means to drain all cargo pumps and all oil lines at the completion of cargo discharge;

.3 stripping devices;

.4 sea chests with valves connected to the cargo pipeline systems with use of positive closing means.

7.2.2 All ships including oil tankers.

7.2.2.1 In every ship provision shall be made for a pipeline to discharge bilge water of machinery spaces and oil residues (sludge) to reception facilities the discharge connections of which shall have flanges of standard dimensions in accordance with Fig. 7.2.2.1.

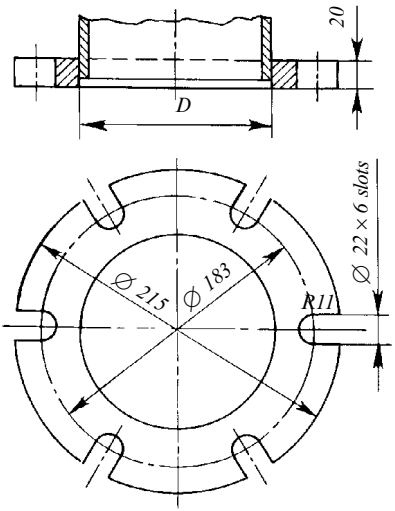

Fig. 7.2.2.1

N o t e . The flange is designed to accept pipes up to the maximum inner diameter of 125 mm and shall be of steel or other equivalent material having a flat face. This flange, together with a gasket of oil proof material, shall be suitable for a service pressure of 0,6 MPa. The flange is connected by six bolts of suitable length and of 20 mm in diameter each.

In well-grounded cases, on agreement with the Register, the pipeline may be led to one side of the ship.

The discharge manifolds shall be located in places convenient for connection of hoses and shall have nameplates. The discharge manifolds shall be provided with blank flanges.

7.2.2.2 The pipelines to standard connections for discharge of bilge water of machinery spaces and oil residues (sludge) shall not be connected to the fuel oil supply pipeline system.

7.2.2.3 Starting and stopping of the discharge arrangements shall be effected manually.

7.2.2.4 In the vicinity of discharge manifolds, provision shall be made for the discharge observation and remote cut-off position or the effective communication system (such as telephone or radio system) between the observation position and the discharge control position.

7.2.2.5 If agreed with the Register, the discharge observation and remote cut-off position, as well as the communications between the observation position and the discharge control position may be unnecessary in ships of less than 24 m in length. In this case measures shall be taken to prevent any potential discharge of bilge water overboard.

8 HOLDING TANKS

8.1 BILGE WATER TANKS

8.1.1 Every vessel operated in inland waterways shall be fitted with the tank(s) for the bilge water of machinery spaces, which capacity is determined according to the formulae given in Table 8.1.1.

Table 8.1.1

Main engine output *P*, in kW	Tank capacity, in m^3
Up to 1000	4,0
Above 1000 up to 20000	*P*/250
Above 20000	40 + *P*/500

8.1.2 In vessels having the total output of internal combustion engines less than 220 kW or in high-speed craft, it is allowed to accumulate bilge oily water under a plating of machinery spaces with its subsequent discharge to reception facilities.

8.1.3 The customer-agreed calculation of the total capacity of bilge water tanks with regard to the period of voyage and the ship's operating conditions shall be submitted to the Register.

8.1.4 Ships operating with heavy fuel oil of a relative density greater than 0,94 at 15 °C shall be provided with the bilge water tank(s) fitted with heating facilities to preheat the oily mixture prior to discharge of the tank(s) content(s) through the separator.

8.2 OIL RESIDUES (SLUDGE) TANKS

8.2.1 Any ship of 400 gross tonnage and above, having regard to the type of machinery and length of voyage, shall be provided with oil residues (sludge) tank or tanks, which minimum capacity V_1, in m^3, shall be calculated by the formulae:

.1 for ships which do not carry ballast water in oil fuel tanks:

$$V_1 = K_1 CD \qquad (8.2.1.1)$$

where K_1 = factor equal to:
0,015 (applied to ships constructed on or after 31 December 1990) and
0,01 (applied to the remaining ones) for ships where heavy fuel oil for main engines is purified before use;
0,005 for ships using diesel oil or heavy fuel oil which does not require purification before use;
C = daily fuel oil consumption, in m^3;
D = maximum period of voyage between ports where oil residues (sludge) may be discharged into reception facilities, in days (where the period of voyage is unknown, it shall be adopted equal to 30 days);

.2 for ships for which a building contract is placed, or in the absence of the building contract the keels of which are laid before 1 July 2010, and which are fitted with homogenizers, oil residues (sludge) incinerators or other means for the control of oil residues (sludge) approved by the Register:

V_1 = 50 per cent of the value stipulated under 8.2.1.1; or

V_1 = 1 m^3 for ships of 400 gross tonnage and above, but less than 4000 gross tonnage or 2 m^3 for ships of 4000 gross tonnage and above, whichever is the greater;

.3 for ships which carry ballast water in fuel oil tanks:

$$V_2 = V_1 + K_2 B \qquad (8.2.1.3)$$

where V_1 = refer to 8.2.1.1 or 8.2.1.2;
K_2 = factor equal to:
0,01 = for heavy fuel oil bunker tanks;
0,005 = for diesel oil bunker tanks;
B = capacity of water ballast tanks which can also be used to carry oil fuel, in tons.

8.2.2 Any vessel of under 400 gross tonnage intended for operation in inland waterways, having regard to the type of the machinery and length of voyage, shall be provided with oil residues (sludge) tank(s) of the minimum capacity according to 8.2.1.

This requirement does not apply to the ships having the total output of all internal combustion engines less than 220 kW and to the dynamically supported craft.

8.2.3 The pipeline system of the holding tank or tanks referred to in 8.2.1 and 8.2.2 shall be provided with a pump intended to discharge their contents into reception facilities, which meets the requirements of 8.2.12. Starting and stopping of the pump shall be effected according to 7.2.2.3.

8.2.4 The pump discharge pipelines of the system referred to in 8.2.3 shall not be connected to the bilge water piping except for the common pipeline running to the standard discharge connections specified in 7.2.2.1.

However, arrangements may be provided to discharge settled water from oil residues (sludge) tanks by means of manually operated self-closing valves or similar arrangements.

8.2.5 Piping to and from oil residues (sludge) tanks shall have no direct connection overboard, other than the common pipeline running to standard discharge connections in accordance with 7.2.2.1.

8.2.6 Oil residues (sludge) tanks shall be designed and constructed so as to facilitate their cleaning and discharge of residues to reception facilities.

8.2.7 Independent tank(s) for collection of drainage and oil leaks shall have a capacity specified in Table 8.2.7. Oil accumulated as the result of separator operation may be also discharged to this tank.

Table 8.2.7

Main engine output P, in kW	Tank capacity, in m^3
Up to 10000	$20 \times D \times P/10^6$
Above 10000	$D \times [0{,}2 + 7 \times (P - 10\,000)\,/10^6]$
Note. D = maximum period of voyage between ports where drainage and oil residues (sludge) may be discharged into reception facilities, in days (where the period of voyage is unknown, it shall be adopted equal to 30 days).	

8.2.8 The capacity of the tank(s) for collection of used oil in ships, where the main and auxiliary engines require the complete replacement of lubricating oil in the absence of shore supply, shall be determined assuming 1,5 m^3 for each 1000 kW of their total output.

8.2.9 The separated dirty water and exhausted control water of fuel oil purifiers shall be discharged into a particular tank for this purpose in order to minimize the influx to the tank for separated sludge. This particular tank shall be located above the double bottom for the purpose of facilitating its drain without the need for a drain pump.

If dirty water and exhausted control water from purifiers are not discharged to a particular tank, and in lieu of this to a tank for separated sludge, the tank shall be located:

above the double bottom for the purpose of the aforementioned draining facilities specified in 8.2.4;

within the double bottom, provided its capacity is sufficient to accumulate both the separated sludge, and the dirty water and exhausted control water.

8.2.10 Wherever possible, the sludge tank shall be located below the heavy fuel oil separator. If this is not possible, the sludge tank shall be situated close to the heavy fuel oil purifier in such a way that the discharge line to the tank can be inclined at the maximum gradient; the pipeline shall, wherever possible, be straight or fitted with large radius elbows.

8.2.11 The sludge tank shall be designed so that oil sludge has free access to the suction line. If this is not possible, the suction opening or the submersible pump shall be arranged so that the oil sludge path to the suction opening is as short as possible.

8.2.12 The pump fit for transferring high viscosity oil sludge shall be self-priming, have means to prevent dry running and a discharge pressure of at least 0,4 MPa.

The pump delivery, in m^3/h, may be determined by the formula

$$Q = V/t \qquad (8.2.12)$$

where V = capacity of the oil residues (sludge) tank to be determined by the formulae given in 8.2.1;

t = emptying time equal to 4 h.

In any case the pump delivery rate shall be not less than 2 m^3/h. The pressure side of the pump shall be only connected to the pipelines running to the deck, oil residues tanks (sludge), and also to oil residues (sludge) incinerators if available on board the ship.

The pump shall be placed relative to the tank inlet pipe at a height of not more than 3 m for ships having the main engine output up to 15000 kW, and 3,5 m, if the main engine output is above 15000 kW.

8.3 CONSTRUCTION AND EQUIPMENT OF HOLDING TANKS

8.3.1 Holding tanks may be independent or built-in. Structural elements of holding tanks shall meet the requirements of Part II "Hull" of the Rules for the Classification and Construction of Sea-Going Ships.

8.3.2 The holding tank shall be provided with:

.1 an access hole for inspection and cleaning;

.2 an air pipe;

.3 a heating system in compliance with 8.3.4 if the tank is intended for collecting separated sludge and heavy fuel oil is used on board the ship;

.4 visual and audible alarm operating in case of 80 per cent filling of the tank.

8.3.3 The inner surfaces of the bottom and the vertical walls of the oil residues (sludge) tank, except for the built-in tanks, as defined in 8.3.1, shall be smooth (external framing). In this case, the bottom shall be inclined towards the spool piece.

8.3.4 Sludge tanks shall be equipped with tank heating systems. At that the heating pipes shall be arranged so that, seen from the heating inlet, they are arranged away from the boundaries and then, across the whole bottom area, sufficiently high to avoid being covered totally by sediments in the tank.

The tank heating system shall be designed so as to enable heating of the oil sludge up to 60 °C.

The suction line from the tank to the pump shall be provided with heat tracing.

8.3.5 The manholes of an oil residues (sludge) tank shall provide access to any area of the tank. One of the manholes shall be located at the top of the tank to ensure using a submersible pump.

8.3.6 Provision shall be made for a steaming pipeline at the top of the oil residues (sludge) tank for its cleaning.

9 OTHER MEANS FOR REMOVAL OF OIL RESIDUES (SLUDGE)

9.1 Other means for removal of oil residues (sludge) may include the following oil residues (sludge) incineration systems:

main and auxiliary steam boilers with appropriate oil residues (sludge) processing systems;

heaters of thermal liquid systems with appropriate oil residues (sludge) processing systems;

incinerators with appropriate oil residues (sludge) processing systems designed for residues incineration;

inert gas systems with appropriate oil residues (sludge) processing systems.

9.2 Oil residues (sludge) processing system shall consist of the following:

oil residues (sludge) service tank intended as servicing the oil residue (sludge) incineration system;

oil residues (sludge) preheating system;

filter; and

homogenization system.

9.3 The oil residues (sludge) service tank shall be equipped with suitable drainage facilities and a fuel oil supply connection shall be provided.

9.4 The homogenization system shall assure that the entire contents of the oil residues (sludge) service tank shall be processed into a homogeneous and combustible mixture. This system shall be put into operation following adequate draining of the tank. The devices for continuous indication and monitoring of the water content of the oil residues (sludge) shall be provided.

10 FUEL OIL TANKS PROTECTION

10.1 DEFINITIONS

10.1.1 In the present Section the following definitions have been adopted.

S m a l l f u e l o i l t a n k means a fuel oil tank with a maximum individual capacity not greater than 30 m^3.

A s h i p d e l i v e r e d o n o r a f t e r 1 A u g u s t 2 0 1 0 means a ship:

for which the building contract is placed on or after 1 August 2007; or

in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 August 2008; or

the delivery of which is on or after 1 August 2010; or

which has undergone a major conversion after the date of placing the contract, or beginning the construction work, or completing that work, corresponding to the above dates during the construction accordingly.

F u e l o i l t a n k means a tank for carrying fuel oil for the main and auxiliary machinery, except overflow tanks.

10.2 REQUIREMENTS

10.2.1 In ships delivered on or after 1 August 2010, as defined in 10.1, fuel oil tanks shall be located as follows:

.1 for ships having an aggregate fuel oil capacity of 600 m^3 and above, fuel oil tanks shall be located above the moulded line of the bottom shell plating nowhere less than the distance h as specified below:

$h = B/20$ m, 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 fuel oil tank boundary shall run parallel to the line of the midship flat bottom as shown in Fig. 3.3.3.1, Pat II "Ship's Construction, Equipment and Arrangements for the Prevention of Pollution by Oil";

.2 for ships having an aggregate fuel oil capacity of 600 m^3 and above, but less than 5000 m^3, fuel oil tanks shall be located inboard of the moulded line of the side shell plating everywhere at a distance not less than w which, as shown

in Fig. 3.3.3.2, Part II "Ship's Construction, Equipment and Arrangements for the Prevention of Pollution by Oil", is measured at any cross-section at a right angle to the side plating:

$w = 0{,}4 + 2{,}4C/20000$ m, or (10.2.1.2)

the minimum value of $w = 1{,}0$ m, however for individual tanks with a fuel oil capacity of less than 500 m^3 the minimum value of $w = 0{,}76$ m;

.3 for ships having an aggregate fuel oil capacity of 5000 m^3 and above, fuel oil 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. 3.3.3.2, is measured at any cross-section at right angles to the side shell as specified below:

$w = 0{,}5 + C/20000$ m, or (10.2.1.3)

$w = 2{,}0$ m, whichever is the lesser.

The minimum value of $w = 1{,}0$ m.

10.2.2 The provisions of 10.2.1 apply to all fuel oil tanks, except small fuel oil tanks, provided that the aggregate capacity of such tanks is not greater than 600 m^3.

10.2.3 Suction wells in fuel oil tanks may protrude into the double bottom below the boundary line defined by the distance h, provided that the distance between the well bottom and the bottom shell plating is not less than $0{,}5h$. The suction wells shall be as small as practicable and shall be dimensioned in proportion to a suction pipe and covered area.

10.2.4 Lines of fuel oil piping located at a distance from the ship's bottom of less than h, as defined in 10.2.1.1, or from the side shell plating less than w, as defined in 10.2.1.2 and 10.2.1.3, shall be fitted with stop valves within or immediately adjacent to the fuel oil 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 navigating bridge or a main machinery control room without traversing exposed freeboard or superstructure decks. The valves shall be closed in case of remote control system failure and shall be kept closed at any time while operating in inland waterways when the tank contains fuel oil except that they may be opened during fuel oil transfer operations.

10.2.5 The provisions of 10.2.3 on the arrangement of fuel oil suction wells may be applied to the location of valves on fuel oil tank pipelines in the same way, namely: these valves may be located at a distance from the bottom shell plating of less than $h/2$ (refer to Fig. 10.2.5).

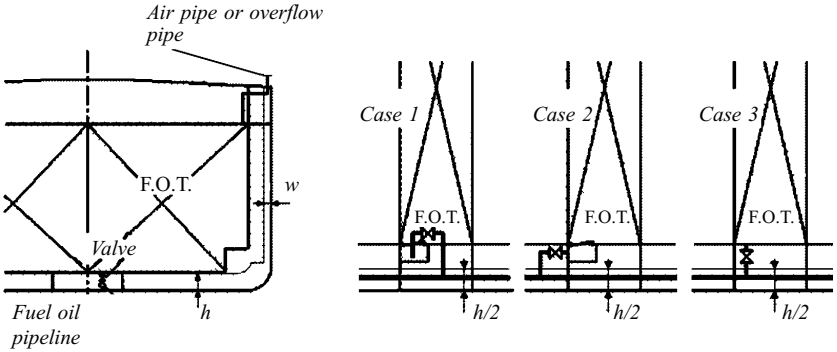

Fig. 10.2.5:
h = minimum distance of fuel oil tanks location from the moulded line of the bottom shell plating, in m;
w = minimum distance of fuel oil tanks location from the moulded line of the side shell plating, in m;
F.O.T. = fuel oil tank

10.2.6 Air or overflow pipes of fuel oil tanks shall not be considered as part of fuel oil piping and therefore may be located at a distance of less than w from the side shell plating (Fig. 10.2.5).

PART III. SHIP'S CONSTRUCTION, EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF POLLUTION BY NOXIOUS LIQUID SUBSTANCES IN BULK

1 DEFINITIONS

1.1 Definitions and explanations pertinent to the general terminology of the Rules are given in Part I "Classification" of the Rules for the Classification and Construction of Sea-Going Ships.

In the present Part of the Rules the following definitions have been adopted.

N o x i o u s l i q u i d s u b s t a n c e s mean substances of Categories X, Y, Z indicated in the pollution category column of Chapter 17 or 18 of the IBC Code.

O t h e r s u b s t a n c e s mean substances indicated as OS (other substances) in the pollution category column of Chapter 18 of the IBC Code which have been evaluated and found to fall outside Category X, Y or Z, because they are, at present, considered to present no harm to marine resources, human health, amenities or other legitimate uses of the sea when discharged into the sea from tank cleaning or deballasting operations.

L i q u i d s u b s t a n c e means a substance having a vapour pressure not exceeding 0,28 MPa absolute at a temperature of 37,8 °C.

C a t e g o r y X means noxious liquid substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a major hazard to either marine resources or human health and, therefore, justify the prohibition of the discharge into the marine environment.

C a t e g o r y Y means noxious liquid substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and, therefore, justify a limitation on the quality and quantity of the discharge into the marine environment.

C a t e g o r y Z means noxious liquid substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a minor hazard to either marine resources or human health and, therefore, justify less stringent restrictions on the quality and quantity of the discharge into the marine environment.

N L S t a n k e r means a ship constructed or adapted to carry a cargo of noxious liquid substances in bulk, and includes an "oil tanker" as defined in Annex I to MARPOL 73/78 when certified to carry a cargo or part cargo of noxious liquid substances in bulk.

R e s i d u e means any noxious liquid substance which remains for disposal.

U n d e r w a t e r d i s c h a r g e o u t l e t means an outlet for discharging the mixtures of noxious liquid substance residues and water.

C h e m i c a l t a n k e r means a ship constructed or adapted for the carriage in bulk of any liquid product listed in Chapter 17 of the IBC Code.

2 SCOPE OF TECHNICAL SUPERVISION

2.1 The types and scope of surveys, as well as the guidelines on the documents issued by the Register are given in Part I "Regulations for Technical Supervision".

3 CONSTRUCTION OF SHIPS CARRYING NOXIOUS LIQUID SUBSTANCES IN BULK

3.1 The construction of ships carrying noxious liquid substances in bulk shall comply with the requirements of the Rules for the Classification and Construction of Chemical Tankers.

4 REQUIREMENTS FOR THE EQUIPMENT OF SHIPS CARRYING NOXIOUS LIQUID SUBSTANCES IN BULK

4.1 VENTILATION SYSTEM EQUIPMENT

4.1.1 When cargo residues shall be removed from cargo tanks by ventilation, the ventilation equipment shall be used complying with the requirements of Section 6, Part VI "Systems and Piping" of the Rules for the Classification and Construction of Chemical Tankers.

4.1.2 Characteristics and arrangement of ventilation equipment.

4.1.2.1 Ventilation equipment shall produce an air jet, which can reach the tank bottom. The minimum flow rate of the ventilation equipment as a function of the jet penetration depth is shown in Fig. 4.1.2.1.

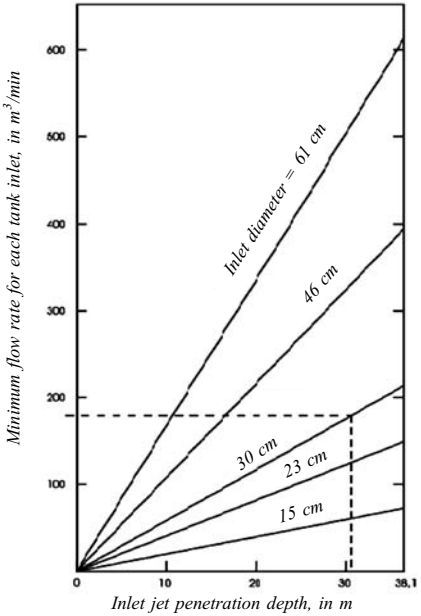

Fig. 4.1.2.1
Minimum flow rate as a function of jet penetration depth

4.1.2.2 Ventilation equipment shall be placed in the tank opening closest to the tank sump or suction point.

4.1.2.3 Ventilation equipment shall, when practicable, be positioned so that the air jet is directed at the tank sump or suction point, and impingement of the air jet on the tank structural members shall be avoided as much as possible.

4.2 TANK WASHING ARRANGEMENTS

4.2.1 Tank washing arrangements are subject to special consideration by the Register in each case.

4.3 DISPOSAL SYSTEMS FOR NOXIOUS LIQUID SUBSTANCES RESIDUES

4.3.1 The discharge of noxious substances within inland waterways is prohibited everywhere and, therefore, tank washings after cleaning operations in a chemical tanker shall be discharged to reception facilities to be available at the consignee's. While navigating within inland waterways, ship's fittings on the pipeline for discharging noxious liquid substances residues shall be sealed.

4.3.2 The arrangement and location of pipelines for pumping and discharge of noxious liquid substances residues shall comply with the requirements of Section 4, Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships.

4.4 CARGO SYSTEMS

4.4.1 Cargo systems shall comply with the requirements of Section 1, Part VI "Systems and Piping" of the Rules for the Classification and Construction of Chemical Tankers, as well as with the requirements of Section 9, Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships.

4.4.2 The cargo system used for unloading noxious liquid substances, which includes cargo and stripping pumps, suction and discharge pipelines and fittings, shall ensure that each tank and the cargo system do not contain a quantity of noxious substances residues in excess of the values specified in regulation 12 of Annex II to MARPOL 73/78.

4.4.3 Pumping performance tests shall use water as the test medium. Such water tests shall, by measurements, show that the system meets the above requirements.

4.5 CARGO PUMP ROOMS

4.5.1 Cargo pump rooms shall comply with the following requirements of the Rules for the Classification and Construction of Chemical Tankers: Section 4, Part II "Structure of Chemical Tanker"; Section 2, Part V "Fire Protection" and Section 18, Part XII "Special Requirements".

4.5.2 The control station of a system for draining pump rooms shall be located outside the pump rooms.

4.5.3 The system for drainage of pump rooms shall ensure the transfer of leakages into a slop or cargo tank.

4.6 UNDERWATER DISCHARGE OUTLET

4.6.1 The ship certified to carry substances of Categories X, Y or Z shall have an underwater discharge outlet (or outlets).

4.6.2 For ships constructed before 1 January 2007 and certified to carry substances in Category Z, an underwater discharge outlet is not mandatory.

4.6.3 Where the underwater discharge outlet is available, it may be used only in the sea areas outside the inland waterways.

4.6.4 The underwater discharge outlet shall be located below the waterline (at any operational draughts) within the cargo area in the vicinity of the turn of the bilge. If dual outlets are provided, they shall be located on the opposite sides of the ship, as specified above.

4.6.5 The underwater discharge outlet shall be arranged so as to avoid the intake of noxious liquid substances by the ship's pumps through sea openings.

4.6.6 The underwater discharge outlet (or outlets) arrangement shall be such that the residue/water mixture discharged into the sea will not pass the ship's boundary layer.

To this end, when the discharge is made normal to the ship's shell plating, the minimum diameter of the discharge outlet is determined by the formula

$$d = Q_d / 5L_d \qquad (4.6.6)$$

where d = minimum diameter of the discharge outlet, in m;
L_d = distance from the forward perpendicular to the discharge outlet, in m.
Q_d = the maximum rate selected at which the ship may discharge a residue/water mixture through the outlet, in m^3/h.

When the discharge is directed at some angle to the ship's shell plating, the above formula shall be modified by substituting for Q_d the component of Q_d which is normal to the ship's shell plating.

5 CARRIAGE OF VEGETABLE OILS

5.1 The carriage of single vegetable oils identified by the relevant footnote in Chapter 17 of the IBC Code is permitted if a chemical tanker meets all the requirements for a type 2 ship specified in the IBC Code.

As specially decided by the RF Administration, the carriage of vegetable oils may be permitted on the chemical tanker meeting all the requirements for ship type 3 except for cargo tanks location. In this case, the entire cargo tank length shall be protected by ballast tanks or spaces other than tanks that carry oil as follows:

.1 wing tanks or spaces shall be arranged such that cargo tanks are located inboard of the moulded line of the side shall plating nowhere less than 760 mm; and

.2 double bottom tanks or spaces shall be arranged such that the distance between the bottom of the cargo tanks and the moulded line of the bottom shell plating measured at right angles to the bottom shell plating is not less than *B*/15 m or 2,0 m at the centreline, whichever is the lesser. The minimum distance shall be 1,0 m.

5.2 In accordance with Resolution MEPC.148(54) dry cargo ships are certified to carry some vegetable oils in deep tanks or independent tanks specially designed for this purpose. The products allowed to be carried are restricted to those unmodified vegetable oils (primarily triglycerides), which are listed in the IBC Code with the indication of pollution hazard only.

5.2.1 The following criteria on construction and carriage shall apply to the above dry cargo ships:

.1 independent tanks for the carriage of vegetable oils shall be located at least 760 mm from the ship's side shell plating;

.2 carriage of vegetable oils in independent tanks or in deep tanks shall be restricted to the trades specially identified by the RF Administration.

5.2.2 Every such dry cargo ship shall have on board the approved Procedures and Arrangements Manual in compliance with Appendix 4 of Annex II to MARPOL 73/78.

PART IV. SHIP'S EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF POLLUTION BY SEWAGE

1 DEFINITIONS

1.1 In the present Part of the Rules the following definitions have been adopted.

Holding tank means a tank used for the collection and storage of untreated sewage, activated sludge and pulp from the sewage and/or sanitary and domestic waste waters treatment plant.

Sewage comminution and disinfection system means a plant, in which sewage is disinfected and the solid particles contained therein are comminuted.

Sewage means:

drainage and other wastes from any form of toilets, urinals and WC scuppers;

drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises;

drainage from spaces containing living animals;

other waste waters when mixed with the drainages defined above.

Sewage treatment plant means a plant, in which sewage and, if applicable, sanitary and domestic waste waters are treated and disinfected.

Sanitary and domestic waste waters mean:

drainage from the wash basins, showers, laundries, wash tubs and scuppers;

drainage from sinks and equipment of galleys and spaces annexed to galleys.

Number of persons on board means crew and special personnel and passengers, which the ship is certified to carry.

2 SCOPE OF TECHNICAL SUPERVISION

2.1 The types and scope of surveys, as well as the guidelines on the documents issued by the Register are given in Part I "Regulations for Technical Supervision".

3 EQUIPMENT FOR COLLECTION, STORAGE, TREATMENT AND DISCHARGE OF SEWAGE, AND SANITARY AND DOMESTIC WASTE WATERS

3.1 GENERAL

3.1.1 Every ship specified in 1.1.1, Part I "Regulations for Technical Supervision" shall be provided with one of the following systems:

.1 sewage treatment plant of an approved type, holding tank(s) for the storage of untreated sewage and holding tank(s) for the storage of sanitary and domestic waste waters;

.2 holding tank(s) for the storage of all untreated sewage and holding tank(s) for the storage of sanitary and domestic waste waters.

3.1.2 Every ship operating only in sea areas, may be provided, instead of the systems specified in 3.1.1, with the Register-approved sewage comminution and disinfection system and holding tank(s) for the storage of untreated sewage and holding tank(s) for the storage of sanitary and domestic waste waters.

3.1.3 It is acceptable to have on board common tank(s) for the storage of untreated sewage and sanitary and domestic waste waters. In this case, discharge from this tank in sea areas shall be performed in compliance with the rules for sewage discharge.

3.1.4 Piping, electrical equipment and automation devices shall comply with the requirements in Part VIII "Systems and Piping", Part IX "Electrical Equipment" and Part XV "Automation" of the Rules for the Classification and Construction of Sea-Going Ships.

3.2 HOLDING TANKS

3.2.1 The customer-agreed calculation of the total capacity of holding tanks having regard to the intended area of navigation, operation of the ship and the number of persons on board shall be submitted to the Register.

3.2.2 Holding tanks may be independent or built-in. The structural elements of holding tanks shall comply with the requirements in Part II "Hull" of the Rules for the Classification and Construction of Sea-Going Ships.

3.2.3 Holding tanks shall be made of steel. The inner surfaces of the tanks shall be smooth (except for built-in tanks), protected against the medium effect and have their bottom inclined towards drain pipes. The holding tanks shall be provided with manholes and fitted with arrangements for water washing and steaming. Arrangements for sewage agitation are recommended.

3.2.4 Holding tanks shall be separated with cofferdams from potable, washing and feed water tanks, vegetable oil tanks, as well as from accommodation, service (utility) and cargo spaces. No cofferdams are required between holding tanks and engine and cargo spaces if the latter are not used for carrying food raw material and foodstuffs.

The holding tank may be placed in a single space having forced exhaust ventilation.

3.2.5 Holding tanks shall be tested at a proof pressure equal to 1,5 times the water column pressure measured from the tank bottom to the lower sanitary unit having no lock in a discharge pipeline, but not less than 25 kPa.

3.2.6 Holding tanks shall be provided with visual and audible alarm activated at their filling by 80 per cent, as well as with means to indicate visually the amount of its contents.

3.3 SEWAGE TREATMENT PLANTS

3.3.1 The capacity of the sewage treatment plant, in litres per day, shall be determined by the formula

$$Q = nq \qquad (3.3.1)$$

where n = number of persons;
q = daily amount of sewage and, if applicable, sanitary and domestic waste waters per a person, in litres (according to the current standard).

3.3.2 The sewage treatment plant installed in ships used for operation in inland waterways shall ensure a purification rate in compliance with the standards given in Table 3.3.2-1 and have the Register Type Approval Certificate in compliance with Resolution MEPC.2(VI) or MEPC.159(55), whichever is applicable.

Table 3.3.2-1

Normalizable characteristics	Sewage treatment and disinfection plants	
	installed before 1997	installed on or after 1997
Suspended solids, in mg/l	⩽50	⩽40
BOD_5, in mg/l	⩽50	⩽40
Coli-index	⩽1000	⩽1000
Residual chlorine, in mg/l	1,5 to 3,0	1,5 to 3,0
COD, in mg/l	—	—
Effluent pH factor	—	—
Notes: suspended solid is a geometric mean of total suspended solids; BOD_5 is a geometric mean of 5-day biochemical oxygen demand; COD is a geometric mean of chemical oxygen demand; coli-index is a geometric mean of the thermotolerant coliforms per 1 litre of water; effluent pH factor is degree of water acidity/alkalinity.		

At that the effluent shall not produce visible floating solids and shall not change a colour of the ambient water.

Sewage treatment plants with a contract date for delivery on or after 1 January 2010 shall ensure purification rate in compliance with the standards given in Table 3.3.2-2 and have the Register Type Approval Certificate in compliance with Resolution MEPC.159(55).

Table 3.3.2-2

Normalizable characteristics	Sewage treatment and disinfection plants with a contract date for delivery on or after 1 January 2010
Suspended solids, in mg/l	⩽35
BOD_5, in mg/l	⩽25
Coli-index	⩽1000
Residual chlorine, in mg/l	⩽0,5
COD, in mg/l	⩽125
Effluent pH factor	6 to 8,5
Notes — refer to Table 3.3.2-1.	

3.3.3 Sewage treatment plants shall be tested for tightness in accordance with 3.2.5. Pipelines shall be subjected to a hydraulic test pressure equal to $p_t = 1{,}5p$ (where p is a working pressure).

3.3.4 Sewage treatment plants shall be subjected to the tests at the manufacturer's or on board the ship according to the program approved by the Register.

3.3.5 Sewage treatment plants may be located in engine rooms or in separate spaces provided with effective forced exhaust ventilation.

3.3.6 Provision shall be made for an effective washing and disinfection system for serving sewage treatment plants, their machinery and piping, and for plants inspection and repairs.

3.3.7 The sewage treatment plant shall be provided with an arrangement for sampling treated and disinfected waters.

3.3.8 Sewage piping from the ship's space scuppers to sewage treatment plants and holding tanks shall be provided with the arrangements preventing the penetration of an untreated sewage smell to ship's spaces.

3.4 SEWAGE COMMINUTION AND DISINFECTION SYSTEMS

3.4.1 The sewage comminution and disinfection systems shall comply with the requirements of 3.3.1, 3.3.2 (for disinfection rate), 3.3.3, 3.3.5 to 3.3.8.

3.4.2 The holding tanks associated with the system shall comply with the requirements of 3.2.

3.4.3 The sewage comminution and disinfection systems shall ensure the comminution of solid particles inherent in sewage to a size not exceeding 25 mm.

3.5 ARRANGEMENTS FOR SEWAGE, AND SANITARY AND DOMESTIC WASTE WATERS DISCHARGE

3.5.1 In every ship, provision shall be made (irrespective of availability of the sewage and sanitary and domestic waste waters treatment plant or the sewage and sanitary and domestic waste waters holding tank) for a pipeline for discharge of sewage and sanitary and domestic waste waters to reception facilities.

The pipeline shall be led to both sides of the ship. In well-grounded cases, by agreement with the Register, the pipeline may be led to one side. The discharge manifolds shall be located in places convenient for connection of hoses and shall be fitted with standard discharge connections with flanges in compliance with Fig. 3.5.1, and also shall be provided with nameplates. The discharge manifolds shall be provided with blank flanges.

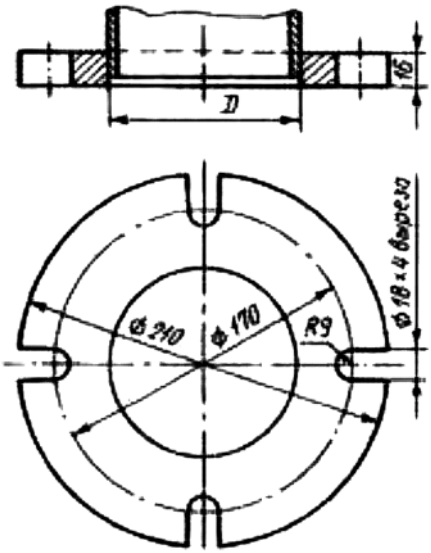

Fig. 3.5.1

N o t e . The flange is designed to accept pipes up to a maximum inner diameter of 100 mm and shall be of steel or other equivalent material having a flat face. This flange, together with a suitable gasket, shall be suitable for a working pressure of 0,6 MPa. For ships having a moulded depth of 5 m and less, the inner diameter of the discharge connection may be 38 mm. The flange is connected by four bolts of suitable length and of 16 mm in diameter each.

3.5.2 Starting and stopping of the discharge arrangements shall be effected manually. In the vicinity of the discharge manifolds provision shall be made for the discharge observation and remote cut-off position or for the effective communication system (telephone or radio system) between the observation position and the discharge control position.

3.5.3 The piping of a system for discharge of sewage and sanitary and domestic waste waters to the reception facilities shall have no connections to the piping of other systems except the specified in 3.5.4.

3.5.4 The piping of a system for discharge of sewage and sanitary and domestic waste waters shall have a possibility to be washed with seawater. At that the washing water shall be drained to the reception facilities or back to the holding tank.

3.5.5 Provision shall be made for two pumps for discharge of sewage and sanitary and domestic waste waters from holding tanks. One of the pumps may

be replaced by an ejector. Taking into account the ship's purpose and service conditions, only one pump may be fitted if agreed with the Register.

3.5.6 If agreed with the Register, the discharge observation and remote cut-off position, as well as the communications between the observation position and the discharge control position may be unnecessary in ships of less than 24 m in length. In this case measures shall be taken to prevent any potential discharge of these waters overboard.

3.5.7 Provision shall be made for a possibility to seal the shut-off valves of discharge piping.

PART V. SHIP'S EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF POLLUTION BY GARBAGE

1 GENERAL

1.1 Provision shall be made for special arrangements for the prevention of pollution by garbage in any ship with people on board.

1.2 In inland waterways, the garbage generated on board the ship shall be collected and stored for discharge to the reception facilities or incineration in a ship's incinerator (in case of no restrictions of the RF Administration).

2 DEFINITIONS

2.1 In the present Part of the Rules the following definitions have been adopted.

Incinerator means the ship's plant for burning of solid waste generated during operation of the ship.

Garbage means all kinds of victual, domestic and operational waste (excluding fresh fish and parts thereof) generated during the normal operation of the ship as specified in Annex V to MARPOL 73/78.

Garbage processing device means a plant for comminution or reducing the volume of garbage.

Garbage receptacle means containers and other receptacles for the collection and storage of garbage.

Number of persons on board means crew, passengers and special personnel, which the ship is certified to carry.

3 SCOPE OF TECHNICAL SUPERVISION

3.1 The types and scope of surveys, as well as the guidelines on the documents issued by the Register are given in Part I "Regulations for Technical Supervision".

4 EQUIPMENT AND DEVICES FOR GARBAGE COLLECTION, STORAGE AND PROCESSING

4.1 GENERAL

4.1.1 In every ship provision shall be made for garbage collection and storage devices. Ships may be fitted with incinerators and garbage processing devices having regard to such factors as the type of the ship, area of navigation, number of crew, etc.

4.1.2 The garbage processing devices and incinerators shall comply with the requirements of Part VIII "Systems and Piping" and Part XI "Electrical Equipment", and the control, regulation and monitoring devices shall comply with the requirements of Part XV "Automation" of the Rules for the Classification and Construction of Sea-Going Ships.

4.2 GARBAGE RECEPTACLES

4.2.1 Garbage receptacles may be removable or permanently fixed.

4.2.2 The customer-agreed calculation of the total capacity of the garbage receptacles having regard to the intended area of navigation, service conditions of the ship and number of persons on board shall be submitted to the Register.

4.2.3 The garbage receptacles shall be so designed as to allow their easy discharge and cleaning.

4.2.4 The garbage receptacles shall have smooth inner surfaces.

4.2.5 The removable garbage receptacles shall be provided with appliances for reliable securing on board the ship.

4.2.6 The garbage receptacles shall be provided with covers ensuring the tight closure of openings for garbage loading.

4.2.7 The garbage receptacles shall be grouped into three categories:

receptacles for plastics;

receptacles for food waste;

receptacles for other garbage.

The garbage receptacles from each of the three categories shall be clearly marked and differ in colour.

4.2.8 Provision shall be made for special containers for collection of ashes from incinerators after plastics incineration which contain the residues of toxic substances or heavy metals.

4.2.9 The garbage receptacles shall be located in places convenient for discharge of garbage to reception facilities and for its transport to processing or incineration locations. The garbage receptacles may be placed on the weather deck or in ventilated spaces isolated from accommodation and service spaces. In all cases garbage shall be so stored to avoid human health and safety hazards.

4.3 GARBAGE COMMINUTERS AND COMPACTORS

4.3.1 The garbage comminuters shall provide for comminution of particles not exceeding 25 mm in size.

4.3.2 Garbage compactors shall be installed in a compartment with an adequate space for operating and maintaining the unit and storing trash to be processed. The compartment shall have a fresh water flushing system, coamings, deck drains, adequate ventilation and fire-fighting equipment.

4.3.3 The garbage comminuters and compactors shall be provided with plates indicating conditions of their use.

4.4 INCINERATORS

4.4.1 The incinerators installed in ships shall have the Type Approval Certificate in compliance with IMO Resolution MEPC.59(33) or MEPC.76(40), whichever is applicable.

4.4.2 The incinerators listed below shall be manufactured and shall have the Type Approval Certificate in compliance with the requirements of Resolution MEPC.76(40) as applied to the incinerators with capacities of up to 1500 kW:

incinerators installed in ships, the keels of which were laid on or after 1 January 2000;

new incinerators installed in existing ships, the date of contract for delivery of which is on or after 1 January 2000.

Utilization in ships of the above mentioned incinerators having no Type Approval Certificate in compliance with the requirements of Resolution MEPC.76(40) is prohibited.

4.4.3 The incinerators installed in existing ships, the date of contract for delivery of which is before 1 January 2000, may have the Type Approval Certificate in compliance with the requirements of Resolution MEPC.59(33) or other normative documents.

4.4.4 Provision shall be made for pans and their efficient drainage in the areas of potential fuel oil and oil residues (sludge) leaks. These latter

accumulated on pans shall be carried away to a piping system for collecting oil leaks.

4.4.5 The exhaust system, fuel oil piping, oil residues (sludge) piping, fittings, mechanical and flexible joints of incinerators shall comply with the requirements of Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships.

4.4.6 The incinerators intended for incineration of oil residues (sludge) shall be provided with an oil residues (sludge) processing system.

4.4.7 The processing system for oil residues (sludge) incineration shall include:

tank for mixing oil residues (sludge) with fuel oil;

oil residues (sludge) preheating system;

homogenization system;

filter.

4.4.8 The homogenization system shall ensure processing oil sludge into a homogenized mixture, which can be incinerated. The system shall be put into operation after proper draining sediment from a tank. Provision shall be made for an arrangement, which continuously measures the water content in the oil sludge.

4.4.9 Incinerators may be installed in machinery spaces or shall be located in separate spaces.

4.4.10 A system for feeding fuel oil to burners shall make possible their shutting off from two locations one of which shall be outside the space wherein the incinerator is installed.

4.4.11 When the incinerator is installed in a separate space, provision shall be made for the following:

.1 plenum-exhaust ventilation providing an adequate air intake needed for the incinerator functioning;

.2 an automatic fire alarm in compliance with 4.2.1, Part VI "Fire Protection" of the Rules for the Classification and Construction of Sea-Going Ships;

.3 fire-extinguishing system in compliance with item 10 in Table 3.1.2.1, Part VI "Fire Protection" of the Rules for the Classification and Construction of Sea-Going Ships.

PART VI. SHIP'S EQUIPMENT AND ARRANGEMENTS FOR THE PREVENTION OF AIR POLLUTION

1 GENERAL

1.1 APPLICATION

1.1.1 The provisions of the present Part of the Rules apply to all the following ships specified in 1.1.1, Part I "Regulations for Technical Supervision":

ships in service not later than the their first scheduled dry-docking after the Rules coming into force;

ships under construction, which technical designs are submitted to the Register for review after the date of the Rules coming into force.

1.2 DEFINITIONS

1.2.1 In the present Part of the Rules the following definitions have been adopted.

Emission means any release of substances subject to control by Annex VI to MARPOL 73/78 from ships into the atmosphere or sea.

Major conversion in relation to nitrogen oxides (NO_x) emission control means modification on or after 19 May 2005 of a marine diesel engine that has not already been certified to the standards set forth in 2.2.6, where:

.1 the engine is replaced by a marine diesel engine, or an additional marine diesel engine is installed; or

.2 any substantial modification, as defined in the revised NOx Technical Code, 2008 is made to the engine; or

.3 the maximum continuous rating of the engine is increased by more than 10 per cent as compared to the maximum continuous rating of the original certification of the engine.

Ozone depleting substances mean controlled substances defined in paragraph 4 of article I of the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, listed in Annexes A, B, C or E to the said Protocol in

force at the time of application or interpretation of Annex VI to MARPOL 73/78.

Ozone depleting substances that may be found on board the ship include, but are not limited to:

halons:

1211 Bromochlorodifluoromethane;

1301 Bromotrifluoromethane;

2402 1,2-Dibromo-1,1,2,2-tetrafluoroethane (also known as Halon 114B2);

chlorofluorocarbons (CFCs):

CFC-11 Trichlorofluoromethane;

CFC-12 Dichlorodifluoromethane;

CFC-113 1,1,2-Trichloro-1,1,2-trifluoroethane;

CFC-114 1,2-Dichloro-1,1,2,2-tetrafluoroethane;

CFC-115 Chloropentafluoroethane.

SO_x emission control area means an area where the adoption of special mandatory measures for SO_x emissions from ships is required to prevent, reduce and control air pollution from SO_x and its attendant adverse impacts on land and sea areas.

Shipboard incineration means the incineration of wastes and other matter on board the ship, if such wastes or other matter were generated during the normal operation of that ship.

Cargo vapour collection system means an arrangement consisting of pipelines and hoses applied for collecting vapours from cargo tanks of oil tankers and their transfer to the device intended for their processing (i.e. utilization, for example, by means of incineration).

Ships constructed mean ships the keels of which are laid or which are at a similar stage of construction.

Installation (in relation to regulation 12 of Annex VI to MARPOL 73/78) means the installation of systems, equipment, including portable fire extinguishers, insulation, or other material on the ship, excluding repair or recharge of previously installed systems, equipment, insulation or other material, or recharge of portable fire extinguishers.

Fuel incinerator in relation to exhaust gas cleaning systems to reduce sulphur oxides (SO_x) emission means any engines, auxiliary boilers, gas turbines or other installations, in which fuel is burned.

1.3 SURVEYS AND SCOPE OF TECHNICAL SUPERVISION

1.3.1 The types and scope of surveys, as well as the guidelines on the documents issued by the Register are given in Part I "Regulations for Technical Supervision".

1.3.2 Subject to the Register technical supervision are the following (if applicable):

.1 installations and systems with regard to applying therein ozone depleting substances (fire-fighting systems, refrigerating equipment);

.2 diesel engines with power output of more than 130 kW power output with regard to nitrogen oxides (NO_x) emission control in compliance with the NO_x Technical Code;

.3 exhaust gas cleaning system for reduction of NO_x emissions in compliance with the NO_x Technical Code;

.4 exhaust gas cleaning system for reduction of sulphur oxides (SO_x) emission in compliance with Resolution MEPC.184(59);

.5 fuel oil system of the ship with regard to possibility of engine change-over to low sulphur fuel oil at the ship entering an SO_x Emission Control Area and of fuel oil sampling at receiving pipeline by means of sampling equipment, which design is approved by the Register in compliance with Resolution MEPC.182(59);

.6 cargo vapour discharge system in relation to the availability of the system approved by the Register on board the oil tankers subject to volatile organic compound (VOC) vapour emission control;

.7 shipboard incinerators.

2 CONTROL OF EMISSIONS FROM SHIPS

2.1 OZONE DEPLETING SUBSTANCES

2.1.1 Any deliberate emissions of ozone depleting substances occurring in the course of recharging, maintaining and repairing of installations on board the ship shall be prohibited (except for the purpose of securing the safety of a ship or saving life at sea, or in case of a ship damage). Deliberate emissions do not include minimal releases associated with recapture or recycling of ozone depleting substances.

2.1.2 The operation of the following installations is prohibited:

.1 installations, which contain ozone depleting substances other than hydro-chlorofluorocarbons (HCFCs):

on ships constructed on or after 19 May 2005; or

in the case of ships constructed before 19 May 2005, which have a contractual delivery date of the equipment to the ship on or after 19 May 2005 or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 19 May 2005;

.2 installations, which contain hydro-chlorofluorocarbons (HCFCs):

on ships constructed on or after 1 January 2020; or

in the case of ships constructed before 1 January 2020, which have a contractual delivery date of the equipment to the ship on or after 1 January 2020 or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 1 January 2020.

2.1.3 The ozone depleting substances and equipment containing such substances shall be delivered to appropriate reception facilities when removed from ships.

2.1.4 Permanently tight equipment containing CFCs and HCFCs with no compounds for charging of cooling agent or removable components shall not be subject to control of ozone depleting substances emissions from ships. Domestic refrigerators, refrigerating chambers, air conditioners, etc. may be considered as such equipment.

2.1.5 Each ship of 400 gross tonnage and above:

shall maintain a list of equipment containing ozone depleting substances. This list shall be entered in the Certificate (form 2.4.18);

which has rechargeable systems that contain ozone depleting substances shall maintain an Ozone Depleting Substances Record Book.

2.1.6 The Ozone Depleting Substances Record Book may form part of an existing log book or electronic recording system as approved by the RF Administration.

Entries in the Ozone Depleting Substances Record Book shall be recorded in terms of mass, in kg, of the ozone depleting substances in respect of the following:

.1 recharge, full or partial, of equipment containing ozone depleting substances;

.2 repair or maintenance of equipment containing ozone depleting substances;

.3 deliberate and non-deliberate discharge of ozone depleting substances to the atmosphere;

.4 discharge of ozone depleting substances to the land-based reception facilities; and

.5 supply of ozone depleting substances to the ship.

2.2 NITROGEN OXIDES (NO_X)

2.2.1 The requirements for control of NO_x emissions shall apply to:

each diesel engine with a power output of more than 130 kW which is permanently installed on a ship constructed on or after 19 May 2005;

each diesel engine with a power output of more than 130 kW which has undergone a major conversion on or after 19 May 2005, except the cases when it is demonstrated that such engine is identical to the one it replaces.

2.2.2 The requirements for control of NO_x emissions do not apply to:

emergency diesel engines;

engines installed in lifeboats and any equipment intended to be used solely in case of emergency;

engines ensuring the operation of mobile offshore drilling units, fixed offshore platforms and floating production units.

2.2.3 The date of major conversion may be determined:

by the contract for this conversion; or

by the date of engine removal from service in compliance with the ship's log book (if the contractual date for conversion is lacking).

2.2.4 For a major conversion involving the replacement of a marine diesel engine with a non-identical marine diesel engine or the installation of an additional marine diesel engine, the requirements in 2.2.1 in force at the time of the replacement or addition of the engine shall apply. On or after 1 January 2016 in the case of replacement engines only, if it is not possible for such a replacement engine to meet the standards applied to the Tier III engines, then that replacement engine shall meet the standards applied to the Tier II engines (tiers are defined further in 2.2.6).

2.2.5 Where substantial modification was made to any diesel engine (except those specified in 2.2.2) on or after 19 May 2005, or its maximum continuous rating was increased by more than 10 per cent, as compared with that of the same engine at its original certification, the NO_x emission (calculated as the total weighted NO_x emission) from the engine shall meet the following standards:

for ships constructed prior to 19 May 2005, the standard applied to the Tier I engines shall apply;

for ships constructed on or after 19 May 2005, the standards in force at the time the ship was constructed (standards for Tier I, II and III engines) shall apply.

2.2.6 The operation of each diesel engine to which regulation 2.2.1 applies, is prohibited, except when the NO_x emission (calculated as the total weighted NO_x emission) from the diesel engine is within the following limits for the

mentioned below tiers of diesel engines compliance with the requirements of regulation 2.2.1:

Tier I: diesel engine is installed in the ship constructed on or after 19 May 2005, but before 1 January 2011:

17,0 g/kWh when n is less than 130 rpm;

$45{,}0 \times n^{(-0{,}20)}$ g/kWh when n is 130 or more, but less than 2000 rpm;

9,8 g/kWh when n is 2000 rpm or more;

Tier II: diesel engine is installed on a ship constructed on or after 1 January 2011:

14,4 g/kWh when n is less than 130 rpm;

$44{,}0 \times n^{(-0{,}23)}$ g/kWh when n is 130 or more, but less than 2000 rpm;

7,7 g/kWh when n is 2000 rpm or more;

Tier III: diesel engine is installed on a ship constructed on or after 1 January 2016 and intended for operation in the RF inland waterways and within the NO_x Emission Control Areas designated in accordance with regulation 13.6 of Annex VI to MARPOL 73/78:

3,4 g/kWh when n is less than 130 rpm;

$9{,}0 \times n^{(-0{,}20)}$ g/kWh when n is 130 or more, but less than 2000 rpm;

2,0 g/kWh when n is 2000 rpm or more;

N o t e . In all cases n is rated engine speed.

The emission standard for Tier II engines may be applied to the diesel engine installed on a ship constructed on or after 1 January 2016 and intended for operation outside the RF inland waterways and the above NO_x Emission Control Areas.

2.2.7 Diesel engines, which are covered by these requirements, shall be subject to pre-certification survey on the manufacturer's test bench in compliance with the Guidelines on the Application of Provisions of the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines. The Register shall approve for those engines the NO_x Technical Files prepared by the manufacturer.

2.2.8 Upon satisfactory results of the survey, the Register shall issue Statements of Compliance for Engine Air Pollution Prevention (form 2.4.40.1) with Supplements (form 2.4.41.1) to the parent engines and to each engine of the group or family.

2.3 SULPHUR OXIDES (SO_X)

2.3.1 The sulphur content of any fuel oil used on board the ships shall not exceed the following limits, even though a Certificate (form 2.4.18) has not been issued to the ship yet:

4,50 % m/m, prior to 1 January 2012;

3,50 % m/m, on and after 1 January 2012; and

0,50 % m/m, on and after 1 January 2020.

2.3.2 For the ships within inland waterways, as well as SO_x Emission Control Areas, the sulphur content of any fuel oil used on board any ship shall not exceed the following limits, even though the Certificate (form 2.4.18) has not been issued to the ship yet:

1,50 % m/m, prior to 1 July 2010;

1,00 % m/m, on and after 1 July 2010; and

0,10 % m/m, on and after 1 January 2015.

2.3.3 A cleaning system of exhaust gases from the shipboard fuel oil combustion machinery approved by the Register, taking into account the provisions of IMO Resolution MEPC.184(59) and the requirements in 2.3.1 and 2.3.2 as appropriate, may be used as an alternative compliance method to reduce the emission of sulphur oxides.

2.3.4 To approve the above plants, according to IMO Resolution MEPC.184(59), it shall be demonstrated their conformity to the above limits on the basis of SO_2 (ppm)/CO_2 (% v/v) ratio values given in Table 2.3.4.

Table 2.3.4

Limits of fuel oil sulphur content and corresponding values of emissions

Fuel oil sulphur content (% m/m)	Emission ratio SO_2 (ppm^{-1}) / CO_2 (% v/v)
4,5	195,0
3,5	151,7
1,5	65,0
1,0	43,3
0,5	21,7
0,1	4,3
Note. The limits of emissions ratios may be only applicable when using petroleum based distillate or residual fuel oils.	

2.3.5 For ships of 400 gross tonnage and above, details of fuel oil delivered to and used on board shall be recorded by means of bunker delivery notes, which shall be under the ship control within three years since the time of fuel oil

delivery and shall be accompanied by a representative fuel oil sample obtained at the receiving inlet bunker manifold by one of the following methods:

.1 manual valve-setting continuous-drip sampler; or

.2 time-proportional automatic sampler; or

.3 flow-proportional automatic sampler.

Bunker delivery notes shall permanently be kept on board even though the Certificate (form 2.4.18) has not been issued to the ship yet.

2.3.6 The representative fuel oil sample shall be retained under the ship control until the fuel oil delivered is substantially consumed, but in any case for a period not less than 12 months from the time of delivery. The fuel oil verification procedure is detailed in Appendix VI of Annex VI to MARPOL 73/78. The requirements for procedure for sampling and storing the samples are set forth in IMO Resolution MEPC.182(59) and IMO Circular MEPC/Circ.508.

2.3.7 Considering the above, the ship fuel oil systems shall ensure the following:

.1 possibility of fuel oil sampling at the receiving inlet bunker manifold by means of the sampler approved by the Register;

.2 possibility of ensuring safe change-over to the fuel oil with sulphur content, as specified in 2.3.2, prior to entry into inland waterways, as well as into SO_x Emission Control Areas. In this case, a possibility of full flushing of the fuel oil service system of all kinds of fuels with sulphur content exceeding the levels specified in 2.3.2 shall be ensured.

2.4 VOLATILE ORGANIC COMPOUNDS (VOC)

2.4.1 All the oil tankers which are subject to volatile organic compounds vapour emission control shall be provided with a vapour collection system approved by the Register in accordance with the requirements of 9.9, Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships.

The Register-approved VOC management plans developed in compliance with Resolution MEPC.185(59) and Circular MEPC.1/Circ.680 shall be available on board the oil tankers carrying crude oil and shall be followed.

2.5 SHIPBOARD INCINERATION

2.5.1 Shipboard solid waste incineration shall be allowed only in a shipboard incinerator having the Type Approval Certificate.

Shipboard incineration of oil residues (sludge) is allowed only in the following approved plants:

incinerators with appropriate system of oil residues (sludge) preparation for burning;

auxiliary steam boilers with appropriate system of oil residues (sludge) preparation for burning;

heaters of thermal liquid heaters with appropriate system of oil residues (sludge) preparation for burning;

inert gas systems with appropriate system of oil residues (sludge) preparation for burning.

2.5.2 Every shipboard incinerator installed on board on or after 1 January 2000 shall have the Type Approval Certificate in compliance with Resolution MEPC.76(40).

2.5.3 The provisions for surveys of incinerators on board the ship are given in 4.4, Part V "Ship's Equipment and Arrangements for the Prevention of Pollution by Garbage".

Российский морской регистр судоходства
Правила по предотвращению загрязнения с судов, эксплуатирующихся в морских районах и внутренних водных путях Российской Федерации 2010 г.

Russian Maritime Register of Shipping
Rules for the Prevention of Pollution from Ships Intended for Operation in Sea Areas and Inland Waterways of the Russian Federation 2010

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