

# GUIDELINES

ON THE APPLICATION OF PROVISIONS  
OF THE INTERNATIONAL CONVENTION  
MARPOL 73/78



Saint-Petersburg  
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The Guidelines on the Application of Provisions of the International Convention for Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) have been approved in accordance with the established approval procedure and come into force 1 December 2010.

The present Guidelines have been prepared on the basis of the regulations of Annexes I, II, IV, V and VI to MARPOL 73/78, taking into consideration amendments, resolutions, circulars and unified interpretations of IMO and IACS, as well as amendments developed immediately before publication.

The Guidelines are intended for surveyors, ship crews and shipowners.

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# **PART I. REGULATIONS FOR TECHNICAL SUPERVISION**

## **1 GENERAL**

### **1.1 SCOPE OF APPLICATION**

**1.1.1** The provisions of the present Guidelines apply during survey of ships and shipboard equipment for compliance with the requirements of annexes to MARPOL 73/78 and IMO resolutions considering IMO and IACS unified interpretations.

**1.1.2** The requirements of Annex I to MARPOL 73/78 (Part II “Ship’s Construction, Equipment and Arrangements for the Prevention of Pollution by Oil”), unless expressly provided otherwise, apply to all ships as specified in regulation 2 of Annex I to MARPOL 73/78.

**1.1.3** The requirements of Annex II to MARPOL 73/78 (Part III “Ship’s Construction, Equipment and Arrangements for the Prevention of Pollution by Noxious Liquid Substances in Bulk”), unless expressly provided otherwise, apply to all ships, which are certified to carry noxious liquid substances in bulk as specified in regulation 2 of Annex II to MARPOL 73/78.

**1.1.4** The requirements of Annex IV to MARPOL 73/78 (Part IV “Ship’s Equipment and Arrangements for the Prevention of Pollution by Sewage”), unless expressly provided otherwise, apply to the following ships engaged in international voyages as specified in regulation 2 of Annex IV to MARPOL 73/78:

- .1** new ships of 400 gross tonnage and above;
- .2** new ships of less than 400 gross tonnage, which are certified to carry more than 15 persons;
- .3** existing ships of 400 gross tonnage and above, in 5 years after the date of entry into force of Annex IV to MARPOL 73/78, i.e. after 27 September 2008;
- .4** existing ships of less than 400 gross tonnage, which are certified to carry more than 15 persons, in 5 years after the date of entry into force of Annex IV to MARPOL 73/78, i.e. after 27 September 2008.

The Administration shall ensure that the existing ships specified in 1.1.4.3 and 1.1.4.4, the keels of which were laid or which were at a similar stage of construction before 2 October 1983 are equipped, as far as practicable, to meet the requirements for sewage discharge in accordance with regulation 11 of Annex IV to MARPOL 73/78.

**1.1.5** The requirements of Annex V to MARPOL 73/78 (Part V “Ship’s Equipment and Arrangements for the Prevention of Pollution by Garbage”), unless expressly provided otherwise, apply to all ships as specified in regulation 2 of Annex V to MARPOL 73/78.

**1.1.6** The requirements of the revised Annex VI to MARPOL 73/78 adopted by Resolution MEPC.176(58) (Part VI “Ship’s Equipment and Arrangements for the Prevention of Air Pollution”), unless expressly provided otherwise in regulations 3, 5, 6, 13, 15, 16 and 18 of Annex VI to MARPOL 73/78, apply to all ships as specified in regulation 1 of Annex VI to MARPOL 73/78 and to each marine diesel engine with a power output of more than 130 kW as specified in regulation 13 of Annex VI to MARPOL 73/78.

**1.1.7** In accordance with Article 4 of MARPOL 73/78 any violation of the requirements of the Convention wherever it occurs, including that one occurred within the jurisdiction of any Party to the Convention, including territorial waters, shall be prohibited.

## **1.2 DEFINITIONS AND EXPLANATIONS**

**1.2.1** In the present Guidelines the following definitions and explanations have been adopted.

**A d m i n i s t r a t i o n** means the Government of the State, under whose authority the ship is operating. With respect to a ship entitled to fly a flag of any State, the Administration is the Government of that State.

**G r o s s t o n n a g e** means the gross tonnage of a ship determined in accordance with the provisions of Annex I to the International Convention on Tonnage Measurement, 1969, or in accordance with the provisions of another Convention which will come into force in lieu of the above Convention.

**I M O** means the International Maritime Organization.

**I B C C o d e** means the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.

**M A R P O L 7 3 / 7 8** 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.

**M o b i l e o f f s h o r e d r i l l i n g u n i t ( M O D U )** means a vessel capable of engaging in drilling operations and/or resources extraction beneath the seabed, such as oil, gas, sulphur or salt.

**F i x e d o f f s h o r e p l a t f o r m ( F O P )** means an offshore oil and gas field structure consisting of a topside and a substructure, which is fixed on the seabed throughout its use and which forms a part of the offshore oil and gas field construction.

**F l o a t i n g o f f s h o r e o i l a n d g a s p r o d u c t i o n u n i t ( F P U )** means a self-propelled or non-self-propelled floating offshore structure, including:

floating production, storage and offloading unit (FPSO);  
floating production and offloading unit (FPO);  
floating storage and offloading unit (FSO);  
single point mooring (SPM).

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 time whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, as well as MODU, FOP and FPU.

NO<sub>x</sub> 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** As to the prevention of pollution by oil, every oil tanker of 150 gross tonnage and above and every other ship of 400 gross tonnage and above shall be subject to the surveys specified below:

**.1** an initial survey before the ship is put in service or before the appropriate certificate is issued for the first time, which shall include a complete survey of its structure, equipment, systems, fittings, arrangements and materials in so far as the ship is covered by the requirements of Annex I to MARPOL 73/78 to ensure that the ship complies with the applicable requirements;

**.2** a renewal survey at intervals not exceeding 5 years, except where regulations 10.2, 10.5, 10.6 or 10.7 of Annex I to MARPOL 73/78 are applicable. This

survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and materials fully comply with the applicable requirements;

**.3** an intermediate survey within 3 months before or after the second anniversary date or within 3 months before or after the third anniversary date of the certificate, which shall take the place of one of the annual surveys specified in 2.1.1.4. This survey shall be such as to ensure that the equipment and arrangements as well as associated systems fully comply with the applicable requirements and are in good working order;

**.4** an annual survey within 3 months before or after each anniversary date of the certificate, including a general inspection of the structure, equipment, systems, fittings, arrangements and materials to ensure that they have been maintained in accordance with paragraphs 4.1 and 4.2 of regulation 6 of Annex I to MARPOL 73/78 and that they remain satisfactory for the service for which the ship is intended;

**.5** an occasional survey, according to the circumstances, which shall be made during a repair as a result of inspections prescribed in paragraph 4.3 of regulation 6 of Annex I to MARPOL 73/78, or whenever any important repairs or renewals are made. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the materials and workmanship of such repairs or renewals are in all respects satisfactory and that the ship complies in all respects with the applicable requirements.

**2.1.2** As to the prevention of pollution by noxious liquid substances in bulk, every ship carrying the above substances shall be subject to the surveys specified below:

**.1** an initial survey according to 2.1.1.1;

**.2** a renewal survey according to 2.1.1.2, except where regulations 10.2, 10.5, 10.6 or 10.7 of Annex II to MARPOL 73/78 are applicable;

**.3** an intermediate survey according to 2.1.1.3;

**.4** an annual survey according to 2.1.1.4 to ensure that the structure, equipment, systems, fittings, arrangements and materials have been maintained in accordance with paragraph 3 of regulation 8 of Annex II to MARPOL 73/78;

**.5** an occasional survey depending on the circumstances, which shall be made during the repair as a result of inspections prescribed in paragraph 3.3 of regulation 8 of Annex II to MARPOL 73/78.

**2.1.3** As to the prevention of pollution by sewage, every ship engaged in international voyages of 400 gross tonnage and above, as well as every ship engaged in international voyages of less than 400 gross tonnage which is certified to carry more than 15 persons according to regulation 4 of Annex IV to MARPOL 73/78 shall be subject to the surveys specified below:

**.1** an initial survey according to 2.1.1.1 within the scope of the requirements of Annex IV to MARPOL 73/78;

**.2** a renewal survey according to 2.1.1.2, except where regulations 8.2, 8.5, 8.6 or 8.7 of Annex IV to MARPOL 73/78 are applicable;

**.3** an occasional survey according to 2.1.1.5;

**2.1.4** As to the prevention of pollution by garbage every ship shall be subject to the surveys according to 2.1.1.1, 2.1.1.2, 2.1.1.4 and 2.1.1.5:

**2.1.5** As to the prevention of air pollution every ship of 400 gross tonnage and above, as well as every MODU, FOP and FPU shall be subject to the surveys specified below according to Resolution MEPC.132(53):

**.1** an initial survey according to 2.1.1.1;

**.2** a renewal survey at intervals not exceeding 5 years, except where regulations 9.2, 9.5, 9.6 or 9.7 of Annex VI to MARPOL 73/78. This survey shall be such as to ensure that the equipment, systems, arrangements and materials fully comply with applicable requirements;

**.3** an intermediate survey according to 2.1.1.3;

**.4** an annual survey according to 2.1.1.4 to ensure that the equipment, systems, arrangements and materials have been maintained in accordance with paragraph 4 of regulation 5 of Annex VI to MARPOL 73/78;

**.5** an occasional survey according to 2.1.1.5, according to the circumstances, which shall be made during a repair as a result of inspections prescribed in paragraph 4 of regulation 5 of Annex VI to MARPOL 73/78.

**2.1.6** As to the prevention of air pollution from engines every engine covered by the requirements of regulation 13 of Annex VI to MARPOL 73/78 shall be subject to the surveys specified below:

**.1** a pre-certification survey according to the NO<sub>x</sub> Technical Code and to the developed on its basis Guidelines on the Application of Provisions of the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines;

**.2** an initial survey of every engine having Engine International Air Pollution Prevention Certificate (Form 2.4.40) with Supplement (Form 2.4.41) shall be conducted on board a ship after the engine is installed but before it is placed in service. This survey may lead (as regards compliance with regulation 13 of Annex VI to MARPOL 73/78) to issuance of the International Air Pollution Prevention Certificate (Form 2.4.6) during the ship's initial survey for compliance with Annex VI to MARPOL 73/78;

**.3** special, intermediate and annual surveys, which shall be conducted as part of the ship's surveys required by regulation 5 of Annex VI to MARPOL 73/78, to

ensure that the engine continues to fully comply with the provisions of regulation 13 of Annex VI to MARPOL 73/78 and NO<sub>x</sub> Technical Code.

**2.1.7** No changes shall be made in the equipment, systems, arrangements and materials covered by the above surveys without the express approval of the Register.

## 2.2 SCOPE OF SURVEYS

**2.2.1** The scope of surveys and intervals between them are given in Table 2.2.1. The surveys listed in item 1 of Table 2.2.1 are performed considering the relevant IACS Unified Interpretation MPC96 (Apr. 2009) set out in Annex to the Rules for the Classification and Construction of Sea-Going Ships “Unified Interpretations of the International Association of Classification Societies” (published in electronic form as a separate edition).

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 or 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 competent bodies, if they are subject thereto.

Nos	Item of survey	Ship survey			
		Initial	Annual	Intermediate	Special
<b>1 Equipment and arrangements for the prevention of pollution by oil</b>					
1.1	Tanks (segregated ballast, slop, cargo, oil fuel, oil residues (sludge) and oily bilge water holding tanks)	OH			OMH
1.2	Crude oil washing system	OHP	P	P	OHP
1.3	15 ppm bilge separator	OP <sup>1</sup>	P <sup>1</sup>	P <sup>1</sup>	OMHP <sup>1</sup>
1.4	15 ppm bilge alarm	EMP	MP	MP	EMP
1.5	Automatic stopping device	OP	P	P	OP
1.6	Standard discharge connection	C	C	C	C
1.7	Discharge monitoring and control system for ballast and washing water	OMP	MP	MP	OMP

1.8	Oil content meter	EMP	MP	MP	EMP
1.9	Oil/water interface detectors in slop tanks	EMP	MP	MP	EMP
1.10	Pumping and discharge arrangement for oily bilge water	OHP	P	P	OHP
1.11	Pumping and discharge arrangement for oil residues (sludge)	OHP	P	P	OHP
1.12	Instrumentation	E	E	E	E
<b>2 Equipment and arrangements for the prevention of pollution by noxious liquid substances in bulk</b>					
2.1	Tanks (segregated ballast, slop, cargo)	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
<b>3 Equipment and arrangements for the prevention of pollution by sewage</b>					
3.1	Sewage treatment plant	OP <sup>2</sup>			OMP <sup>2</sup>
3.2	Sewage comminution and disinfection system	OP			OMP
3.3	Holding tanks	O			OM
3.4	Sewage discharge system	OP			OP
3.5	Standard discharge connection	C			C
3.6	Instrumentation	E			E
<b>4 Equipment and arrangements for the prevention of pollution by garbage</b>					
4.1	Incinerator	OP	P	P	OMP
4.2	Garbage comminutors and compactors	OP	P		OP
4.3	Garbage receptacles	C	C		C
4.4	Instrumentation	E	E		E
<b>5 Equipment and arrangements for the prevention of air pollution</b>					
5.1	Engines covered by regulation 13 of Annex VI to MARPOL73/78	OMP	OM	OM	OM
5.2	Arrangements for conversion of the engines to fuel oil with low sulfur content	OP	P	P	OP
5.3	Exhaust gas cleaning system to reduce SO <sub>x</sub> emissions	OMP	P	P	OMP
5.4	Approved method to ensure that the engine complies with the applicable NO <sub>x</sub> limit	OMP	P	P	OMP
5.5	Volatile organic compounds vapours collection system	OP	P	P	OP
5.6	Incinerators	OMP	P	P	OMP
5.7	Instrumentation	E	E	E	E

<sup>1</sup> At annual surveys of ships flying the RF flag, the results of the sample analysis carried out by a recognized laboratory shall be submitted. At initial survey and special surveys of ships flying any flag, sample extraction is made being witnessed by a surveyor to the Register with subsequent submission of the results of the sample analysis made by a recognized laboratory.

<sup>2</sup> At initial survey and special surveys of ships flying the RF flag, conclusion of state sanitary authorities is submitted to confirm compliance of the plants with the requirements of Annex VI to MARPOL 73/78.

## 2.3 CERTIFICATES ISSUED

**2.3.1** When authorized by administrations and after initial or renewal surveys, as well as pre-certification surveys of engines, the Register issues the following certificates:

**.1** International Oil Pollution Prevention Certificate (Form 2.4.5) issued to any oil tanker of 150 gross tonnage and above with Supplement (Form 2.4.26) and any other ship of 400 gross tonnage and above with Supplement (Form 2.4.20) which are engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to MARPOL 73/78;

**.2** International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk (Form 2.4.7) issued to any ship intended to carry noxious liquid substances in bulk (except substances listed in Chapter 17 of IBC Code) and engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to MARPOL 73/78;

**.3** International Sewage Pollution Certificate (Form 2.4.9) issued to any ship of 400 gross tonnage and above, as well as any ship of less than 400 gross tonnage which is certified to carry more than 15 persons, engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to MARPOL 73/78;

**.4** Certificate of Compliance of Equipment and Arrangements of the Ship with the Requirements of Annex V to MARPOL 73/78 (Form 2.4.15) issued to any ship engaged in voyages to ports or to offshore terminals under the jurisdiction of other Parties to MARPOL 73/78;

**.5** International Air Pollution Prevention Certificate (Form 2.4.6) with Supplement (Form 2.4.23) issued to any ship of 400 gross tonnage and above engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to MARPOL 73/78;

**.6** Engine International Air Pollution Prevention Certificate (Form 2.4.40) with Supplement (Form 2.4.41) issued to any engine covered by regulation 13 of

Annex VI to MARPOL 73/78 and installed on a ship which is engaged in international voyages irrespective of the ship's gross tonnage for the whole service life of this engine.

### 3 TECHNICAL DOCUMENTATION

**3.1** At initial survey of ships for compliance with the requirements of MARPOL 73/78, availability on board the ship of all the required documentation according to 19.7.5, 19.7.6, 19.8.3, 19.9.3, 19.10.3 and 19.13.3, 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 verified.

In addition to the above, it is necessary to verify 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 a copy of Certificate of Firm Conformity (Form 7.1.27) of this shore center (for oil tankers of 5000 deadweight and above);
- .3** Ozone Depleting Substances Record Book (if applicable);
- .4** approved EGCS-SO<sub>x</sub> Operating Manual (scheme A) (if applicable);
- .5** approved EGCS-SO<sub>x</sub> Operating Manual (scheme B) (if applicable);
- .6** copy of SO<sub>x</sub> Emission Compliance Certificate/Certificate of Unit Approval for Exhaust Gas Cleaning Systems (Form 2.4.42) (if applicable);
- .7** approved Onboard Monitoring Manual (if applicable);
- .8** approved SO<sub>x</sub> Emission Control Area (SECA) Compliance Plan (when EGCS-SO<sub>x</sub> is used);
- .9** procedure for operations on preparation of the ship's fuel oil system for running on low sulphur fuel oil with sulphur content according to regulation 14.4 of Annex VI to MARPOL 73/78, prior to entry into the SO<sub>x</sub> emission control area and the relevant ship's log book 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;
- .10** Volatile Organic Compounds Management Plan (for oil tankers carrying crude oil, if applicable);

**.11** Operation Manual for cargo vapours discharge system (for oil tankers, if applicable);

**.12** approved Ship to Ship Transfer Operation Plan (for oil tankers from 1 January 2011, if applicable);

**.13** programme and test results to determine 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 MARPOL 73/78, the availability on board the ship of documentation according to 3.1 shall be verified, as well as of the following documentation:

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

**.2** full complement of previous Survey Reports, including measurement results of hull members, records of repairs, as well as Report of Oil Tanker Survey within condition assessment scheme (CAS);

**.3** record books of engines parameters for engines covered by the requirements of NO<sub>x</sub> Technical Code;

**.4** bunker delivery notes.

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

### **1 DEFINITIONS AND EXPLANATIONS**

**1.1** In the present Part the following definitions and explanations have been adopted.

**Wing tank** means any tank adjacent to the side shell plating.

**Lightweight** 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.

**Deadweight (DW)** means the difference between the displacement of a ship in water of a density of 1,025 t/m<sup>3</sup> at the load waterline corresponding to the assigned summer freeboard and the lightweight of the ship.

**Length (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 metres.

**Anniversary date** means the day and the month of each year, which will correspond to the date of expiry of the International Oil Pollution Prevention Certificate.

**Fuel oil** 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 specification acceptable to IMO.

**Major conversion** means a conversion of a ship:

which substantially alters the dimensions or carrying capacity of the ship; or  
which changes the type of the ship; or

the intent of which in the opinion of the Administration is substantially to prolong its life; or

which otherwise so alters the ship that, if it were a new ship, it would become subject to relevant provisions of MARPOL 73/78 not applicable as an existing ship.

Notwithstanding the provisions of this definition:

conversion of an oil tanker of 20 000 t deadweight and above delivered on or before 1 June 1982, as defined in regulation 1.28.3 of Annex I to MARPOL 73/78,

to meet the requirements of regulation 18 of this Annex shall not be deemed to constitute a major conversion for the purposes of this Annex;

conversion of an oil tanker delivered before 6 July 1996, as defined in regulation 1.28.5 of Annex I to MARPOL 73/78, to meet the requirements of regulation 19 or regulation 20 of this Annex shall not be deemed to constitute a major conversion for the purposes of this Annex;

alterations or modifications necessary for moving of an existing FPU (FPSO, FPO or FSO) to another area shall not be deemed to constitute a major conversion for the purposes of Annex I to MARPOL 73/78.

Segregated ballast 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.

Combination carrier means a ship designed to carry either oil or solid cargoes in bulk.

Instantaneous rate of discharge of oil content 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 (the definition is not applicable to FPSO/FSO at the site of their operation inasmuch as this definition shall apply to the ship proceeding en route).

A midships 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”, 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 (FPSO and FSO not included in the definition).

Crude oil tanker means a ship engaged in trade of carrying crude oil.

Category 1 oil tanker means an oil tanker of 20 000 tonnes deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and deadweight of 30 000 tonnes deadweight and above carrying oil other than the above, which does not comply with the requirements for oil tankers delivered after 1 June 1982, as defined below.

Category 2 oil tanker means an oil tanker of 20 000 tonnes deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and of 30 000 tonnes deadweight and above carrying oil other than the above, which complies with the requirements for oil tankers delivered after 1 June 1982, as defined below.

Category 3 oil tanker means an oil tanker of 5 000 tonnes deadweight and above but less than that specified above for Category 1 or Category 2 oil tankers.

Oil tanker delivered on or before 1 June 1982 means an oil tanker:

for which the building contract was placed on or before 1 June 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 1 January 1980; or  
the delivery of which was on or before 1 June 1982; or  
which has undergone a major conversion on the date of placing the contract, or beginning the construction work, or completing those work, or before these dates corresponding to the above dates during the construction accordingly.

Oil tanker delivered after 1 June 1982 means an oil tanker:  
for which the building contract was placed after 1 June 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 1 January 1980; or  
the delivery of which was after 1 June 1982; or  
which has undergone a major conversion after the date of placing the contract, or beginning the construction work, or completing those work, corresponding to the above dates during the construction accordingly.

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 those 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 those work, or after these dates corresponding to the above dates during the construction accordingly.

Oil tanker delivered on or after 1 February 2002 means an oil tanker:

for which the building contract was placed on or after 1 February 1999; 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 August 1999; or  
the delivery of which was on or after 1 February 2002; or  
which has undergone a major conversion on the date of placing the contract,  
or beginning the construction work, or completing those 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 those 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 bilge water** means water which may be contaminated by oil re-  
sulting from things such as leakage or maintenance work in machinery spaces.  
Any liquid entering the bilge system including bilge wells, bilge piping, tank top  
or bilge holding tanks is considered oily bilge water.

**Oily mixture** means a mixture with any oil content.

**Oil** means petroleum in any form including crude oil, fuel oil, oil residues  
(sludge), oil refuse and refined products (other than those petrochemicals which  
are subject to the provisions of Annex II to MARPOL 73/78) and, without limit-  
ing the generality of the foregoing, includes the substances listed in Appendix I of  
Annex I to MARPOL 73/78.

**Heavy grade oil** means any of the following:  
crude oils having a density at 15 °C higher than 900 kg/m<sup>3</sup>;  
oils, other than crude oils, having either a density at 15 °C higher than  
900 kg/m<sup>3</sup> or a kinetic viscosity at 50 °C higher than 180 mm<sup>2</sup>/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 con-  
ventional pumping or processing and requires special methods and devices for  
disposal from the ship.

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

**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 any 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.

**Hypothetical outflow of oil** means an outflow in case of assumed damage of the ship calculated as defined in regulation 25 of Annex I to MARPOL 73/78.

**15 ppm 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 not exceeding 15 ppm.

**15 ppm bilge alarm** means a device giving off a signal whenever the oil content in the effluent exceeds 15 ppm.

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

for which the building contract was placed on or before 31 December 1975; 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 31 July 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 those 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 1975; 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 those work, corresponding to  
the above dates during the construction accordingly.

**Oil residues (sludge) incinerators** mean the following:

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 oil residues (sludge) incineration;

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

**Crude oil** means any liquid hydrocarbon mixture occurring naturally in the earth whether or not treated to render it suitable for transporting 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.

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

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

**Centre tank** means any tank inboard of a longitudinal bulkhead.

**Clean ballast** means the ballast in a tank which since oil was last carried therein, has been so cleaned that effluent therefrom if it were discharged from a ship which is stationary into clean calm water on a clear day would not produce visible traces of oil on the surface of the water or on adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines. If the ballast is discharged through an oil discharge monitoring and control system approved by the Administration, evidence based on such a system to the effect that instantaneous rate of discharge of oil content did not exceed 30 litres per nautical mile shall be determinative that the ballast was clean, notwithstanding the presence of visible traces.

**Breadth (B)** means diesel 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 metres.

## **2 TYPES AND SCOPE OF SURVEYS**

**2.1** The types and scope of surveys, as well as documents issued by the Russian Maritime Register of Shipping<sup>1</sup> are given in Part I “Regulations for Technical Supervision”.

## **3 MARPOL 73/78 REQUIREMENTS FOR OIL TANKERS**

### **3.1 SEGREGATED BALLAST TANKS**

**3.1.1** Every crude oil tanker of 20 000 tonnes deadweight and above and every product carrier of 30 000 tonnes deadweight and above delivered after 1 June 1982, as defined in Section 1, shall be provided with segregated ballast tanks and shall comply with paragraphs 2, 3 and 4, or 5 as appropriate, of regulation 18 of Annex I to MARPOL 73/78.

**3.1.2** Every crude oil tanker of 40 000 tonnes deadweight and above delivered on or before 1 June 1982, as defined in Section 1 shall be provided with segregated ballast tanks and shall comply with the requirements of paragraphs 2 and 3 of regulation 18 of Annex I to MARPOL 73/78.

Notwithstanding the above, these oil tankers may have no segregated ballast tanks provided the following conditions are satisfied simultaneously:

oil tankers operate with a cargo tank cleaning procedure using the crude oil washing in accordance with regulations 33 and 35 of Annex I to MARPOL 75/78; and

oil tankers are not intended to carry crude oil which is not suitable for crude oil washing.

**3.1.3** Every product carrier of 40 000 tonnes deadweight and above delivered on or before 1 June 1982, as defined in Section 1 segregated ballast tanks shall be provided with segregated ballast tanks and shall comply with the requirements of

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<sup>1</sup> Hereinafter referred to as “the Register”.

paragraphs 2 and 3 of regulation 18 of Annex I to MARPOL 73/78, or alternatively operate with dedicated clean ballast tanks in accordance with the provisions of paragraphs 8.1 to 8.4 of regulation 18 of Annex I to MARPOL 73/78.

**3.1.4** In every crude oil tanker of 20 000 tonnes deadweight and above and every product carrier of 30 000 tonnes deadweight and above delivered after 1 June 1982, as defined in Section 1, except those tankers delivered on or after 6 July 1996 that meet the double hull and double bottom requirements in accordance with regulation 19 of Annex I to MARPOL 73/78, the segregated ballast tanks required to provide the capacity to comply with the requirements of paragraph 2 of regulation 18 of Annex I to MARPOL 73/78, which are located within the cargo tank length, shall be arranged in accordance with the requirements of paragraphs 13, 14 and 15 of regulation 18 of Annex I to MARPOL 73/78 to provide a measure of protection against oil outflow in the event of grounding or collision.

**3.1.5** Any oil tanker of less than 150 m in length may be considered by the Register as a segregated ballast tanker, provided that the draught of the tanker is calculated by one of the recommended formulae given in Table 3.1.5.

Taking into consideration the unique operating requirements, the surveyor to the Register shall make certain that the particular oil tanker has a sufficient ballast capacity for safe operation. In any case the stability shall be examined independently.

Table 3.1.5

Formula	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	–	–	$0,2+0,032L$	–	$(0,024-6\times 10^{-5}L)L$
B	$0,700+0,0170L$	$2,3+0,030L$	–	$1,550+0,023L$	$1,600+0,013L$
C	$0,5000+0,0225L$	$2,0000+0,0275L$	–	–	–
<p>Note:</p> <p>A – applied for ships of 50 to 150 m in length. Therewith, good ballast conditions during sailing in weather up to and including Beaufort scale 5 are provided.</p> <p>B – good ballast conditions during sailing in weather up to and including Beaufort scale 6 are provided. The formulae of minimum draught at bow and stern, or minimum mean draught or minimum trim may be used in calculation.</p> <p>C – contains certain increased draughts to prevent the propeller emergence and slamming.</p>					

**3.1.6** Any oil tanker which is not required to be provided with segregated ballast tanks in accordance with 3.1.1 to 3.1.3 may, however, be qualified as a

segregated ballast tanker, provided that it complies with the requirements of paragraphs 2, 3, 4 or 5 of regulation 18 of Annex I to MARPOL 73/78.

**3.1.7** Oil tankers delivered on or before 1 June 1982, as defined in Section 1, having special ballast arrangements shall be so constructed or operate in such a manner that they comply at all times with the draught and trim requirements set out in paragraph 2 of regulation 18 of Annex I to MARPOL 73/78 without recourse to the use of ballast water, provided that the requirements of paragraph 10 of regulation 18 of Annex I to MARPOL 73/78 are complied with.

**3.1.8** Oil tankers of 70 000 tonnes deadweight and above delivered after 31 December 1979, as defined in Section 1, shall be provided with segregated ballast tanks and shall comply with paragraphs 2, 3 and 4, or 5 of regulation 18 of Annex I to MARPOL 73/78.

**3.1.9** 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.

**3.1.10** 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. The segregated ballast pipelines and tanks shall not be connected to the pipelines of the freshwater system. The segregated ballast tanks shall not be used for the carriage of any cargo or for storage of any ship's stores or materials.

## **3.2 SLOP TANKS**

**3.2.1** Every oil tanker of 150 gross tonnage and above shall be provided with a slop tank or combination of slop tanks in accordance with the requirements of regulation 29 of Annex I to MARPOL 73/78. In oil tankers delivered on or before 31 December 1979, as defined in Section 1, any cargo tank may be designated as a slop tank. The capacity of a slop tank or combination of slop tanks shall comply with the requirements of paragraph 2.3 of regulation 29 of Annex I to MARPOL 73/78.

**3.2.2** Oil tankers of 70 000 tonnes deadweight and above delivered after 31 December 1979, as defined in Section 1, shall be provided with at least two slop tanks.

**3.2.3** Inlets, outlets and baffles of slop tanks shall be so positioned as to avoid excessive turbulence and entrainment of oil or emulsion with the water.

**3.2.4** The requirements of regulation 29 of Annex I to MARPOL 73/78 maybe waived for any oil tanker in the following cases:

**.1** an oil tanker is engaged in voyages of 72 hours or less in duration within 50 miles or less from the nearest land, provided that the oil tanker is engaged exclusively in trades between ports or terminals within a State Party to Annex I to MARPOL 73/78, provided also that all oily mixtures are retained on board for their subsequent discharge to reception facilities, and that the Administration ascertains that such reception facilities are adequate to receive such oily mixtures;

**.2** an oil tanker is engaged in the carriage of asphalt, provided that all residues are retained on board for the subsequent discharge of the residues and tank washings to reception facilities;

**.3** an oil tanker of less than 150 gross tonnage, provided that oil is retained on board for subsequent discharge of all tank washings to reception facilities.

**3.2.5** The requirements of regulation 29 of Annex I to MARPOL 73/78 apply to ships other than oil tankers fitted with cargo spaces of an aggregate capacity of 200 m<sup>3</sup> and above specially designed and used to carry oil. The said requirements also apply to FPU (FPSO and FSO).

These provisions are not applicable if the total capacity of these spaces is less than 1000 m<sup>3</sup>, provided oil residues (sludge) and tank washings are retained on board for subsequent discharge to reception facilities.

**3.2.6** Where a pipeline is provided for discharge of oily bilge water from machinery spaces to slop tanks, it shall be provided with a reliable means to prevent cargo or vapour from penetrating into machinery spaces.

### **3.3 CARGO TANKS**

**3.3.1** Every oil tanker of 150 gross tonnage and above delivered after 31 December 1979, but before 1 January 2010, and delivered on or before 31 December 1979, which falls into one of the following categories:

a tanker, the delivery of which is after 1 January 1977, or

a tanker to which both the following conditions apply:

delivery is not later than 1 January 1977, and

no building contract has previously been placed, but the keel is laid, or the tanker is at a similar stage of construction after 30 June 1974,

as regards limitations of size and arrangement of cargo tanks, as well as pipelines connecting cargo tanks and pipelines running through cargo tanks shall comply with the provisions of regulation 26 of Annex I to MARPOL 73/78.

### **3.4 CRUDE OIL WASHING SYSTEM**

**3.4.1** Every crude oil tanker of 20 000 tonnes deadweight and above delivered after 1 June 1982, as defined in Section 1, shall be fitted with a crude oil washing system. This system shall fully comply with the requirements of regulation 33 of Annex I to MARPOL 73/78 within one year after the tanker was first engaged in the trade of carrying crude oil or by the end of the third voyage carrying crude oil suitable for crude oil washing, whichever occurs later.

**3.4.2** FPU (FPSO and FSO) shall be fitted with a crude oil washing system if the properties of the oil extracted are suitable for crude oil washing.

**3.4.3** Any cargo or slop tank fitted with a crude oil washing system shall be provided with an inert gas system in accordance with the requirements of 9.16, Part VIII “Systems and Piping” of the Rules for the Classification and Construction of Sea-Going Ships.

**3.4.4** The crude oil washing system and associated equipment and arrangements (piping, tank washing machines, pumps, stripping system and ballast pipelines) shall comply with Specifications for the Design, Operation and Control of Crude Oil Washing Systems in accordance with the provisions of Resolution A.446(XI), as amended by Resolutions A.497(XII) and A.897(21), as well as the requirements of 9.12, Part VIII “Systems and Piping” of Rules for the Classification and Construction of Sea-Going Ships.

### **3.5 REQUIREMENTS OF ANNEX I TO MARPOL 73/78 FOR DOUBLE HULL OF OIL TANKERS**

#### **3.5.1 Cargo tanks protection.**

**3.5.1.1** Double hull (double sides and double bottom) of oil tankers of 600 tonnes deadweight and above delivered on and after 6 July 1996, as defined in Section 1, shall comply with the requirements of regulation 19 of Annex I to MARPOL 73/78.

**3.5.1.2** Oil tankers of 5 000 tonnes deadweight and above delivered before 6 July 1996, as defined in Section 1, shall comply with the double hull requirements in accordance with paragraphs 2 to 5, 7 and 8 of regulation 19 of Annex I to MARPOL 73/78, considering conditions specified in regulation 20 of Annex I to MARPOL 73/78.

**3.5.1.3** Oil tankers of 600 t deadweight and above carrying heavy grade oil as cargo regardless of the date of delivery shall meet double hull and double bottom requirements according to paragraphs 2 to 8 of regulation 19 of Annex I to MARPOL 73/78, on conditions specified in regulation 21 of this Annex.

**3.5.1.4** For FPU (FPSO and FSO) it is recommended to apply regulations 19.3.1, 19.3.6, 19.7 and 19.8 of Annex I to MARPOL 73/78.

**3.5.2 Cargo pump rooms protection.**

**3.5.2.1** On oil tankers of 5000 t deadweight and above constructed on or after 1 January 2007, cargo pump rooms shall be provided with the following protective means in accordance with the requirements of regulation 22 of Annex I to MARPOL 73/78:

**.1** on these ships cargo pump rooms shall be provided with a double bottom. The double bottom protecting the cargo pump room may be a void tank, a ballast tank or, unless prohibited by other regulations, an oil fuel tank;

**.2** ballast pumps shall be provided with suitable arrangements to ensure efficient discharge from double bottom tanks;

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

**.4** suction wells within the double bottom of cargo pump rooms shall be as small as practicable, and the distance between the well bottom and the ship's base line measured at right angles to the ship's base line shall be not less than half height of the double bottom.

**3.5.2.2** In case the cargo pump room bottom or part thereof (cases NO 2 and NO 3, Fig. 3.5.2.2) is located above the ship's base line (BL) by at least the minimum height required in regulation 22.2 of Annex I to MARPOL 73/78, 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 required in regulation 22.2, this part of the pump room shall serve as a double bottom protecting the above part of the pump room (cases NO 1 and NO 3, Fig. 3.5.2.2).

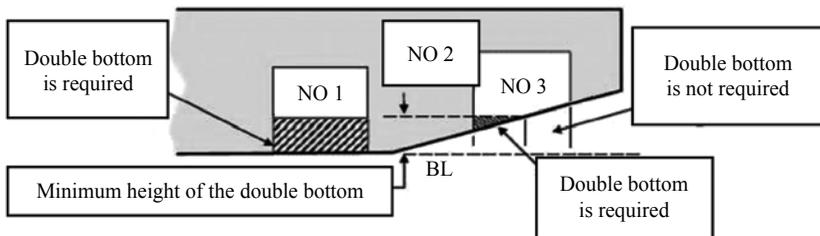


Fig. 3.5.2.2

## **4 CALCULATION OF DAMAGE ASSUMPTIONS AND HYPOTHETICAL OUTFLOW OF OIL FOR OIL TANKERS**

**4.1** For oil tankers delivered before 1 January 2010, as regards hypothetical outflow of oil, as well as limitations of size and arrangement of cargo tanks, regulations 25 and 26 of Annex I to MARPOL 73/78 shall apply.

For the purpose of calculating hypothetical oil outflow damage assumptions shall be in accordance with regulation 24 of Annex I to MARPOL 73/78.

The pipeline installed within the double bottom shall be fitted with valves or other closing arrangements at the point of connection to the tank served. In accordance with the unified interpretation of regulation 25.3.3 (MEPC 56/23, Annex 15) these valves shall be installed not less than  $h/2$  distant from the bottom plate (refer to Fig. 13.2.6). Apart from the fact that the suction wells referred to in regulation 25.3.3 of Annex to MARPOL 73/78 shall not be excessive in area, their size shall correspond to this of the suction.

As reducing oil outflow in case of bottom damage, the approved cargo transfer systems are used according to paragraph 5 of regulation 25 of Annex I to MARPOL 73/78. If the installed cargo transfer system connects two cargo tanks or more, valves or other closing arrangements shall be provided to separate tanks from each other.

**4.2** For oil tankers delivered on or after 1 January 2010, accidental oil outflow performance apply according to regulation 23 of Annex I to MARPOL 73/78 considering the provisions of Resolution MEPC.122(52) as amended by Resolution MEPC.146(54). The oil outflow for each cargo tank shall be calculated subject to the unified interpretation of regulation 23.7.3.2 (accidental oil outflow performance) of Annex I to MARPOL 73/78 (MEPC.59/24, Annex 24).

**4.3** For FPU (FPSO and FSO) the application of regulations 24 and 25 of Annex I to MARPOL 73/78 is recommended as regards side damage only.

## **5 THE 15 PPM BILGE SEPARATORS**

### **5.1 GENERAL**

**5.1.1** Any ship of 400 gross tonnage and above shall be fitted with the 15 ppm bilge separator.

It is recommended that any ship of less than 400 gross tonnage be fitted with the 15 ppm bilge separator.

**5.1.2** The provisions of 5.1.1 are not applicable to the ships covered by the provisions of 11.1.2.

**5.1.3** The 15 ppm bilge separator shall be of the approved design according to the provisions of the applicable IMO Resolutions (A.393(X), MEPC.60(33), MEPC.107(49)) and be of capacity sufficient to provide oil content in the oily mixture discharged overboard not exceeding 15 ppm.

## **5.2 TECHNICAL REQUIREMENTS OF THE NORMATIVE DOCUMENTS**

**5.2.1** The 15 ppm bilge separators preventing discharge of oily bilge water with the oil content exceeding 15 ppm shall comply with the technical requirements and requirements for tests for type approval according to the provisions of Resolution MEPC.107(49) (considering the provisions of MEPC.1/Circ.643) in the following cases:

**.1** the 15 ppm bilge separators are fitted on ships, the keels of which are laid on or after 1 January 2005;

**.2** the 15 ppm bilge separators are ordered on or after 1 January 2005, for fitting on ships, the keels of which are laid before that date (refer to MEPC/Circ.420).

**5.2.2** The 15 ppm bilge separators are considered to be applicable for use in conjunction with oily bilge water and oily ballast water from oil fuel tanks, as these are of low or medium capacity.

**5.2.3** The 15 ppm bilge separators shall be so designed that they are capable of reliable operation under the environment conditions in accordance with 2.3, Part VII “Machinery Installations” and 2.1, Part XI “Electrical Equipment” of the Rules for the Classification and Construction of Sea-Going Ships.

**5.2.4** The 15 ppm bilge separators operating under excessive pressure shall be provided with safety devices. A safety device shall be set to a pressure equal to  $p_{open} = 1,1 p$ , where  $p$  is working pressure.

**5.2.5** The 15 ppm bilge separators shall be of a reliable design. Units and parts subject to periodical examination and maintenance shall be readily accessible for attending personnel. The capacity of the 15 ppm bilge separator pump shall be consistent with the throughput of the 15 ppm bilge separator. In any case the capacity of the 15 ppm bilge separator shall not exceed more than 1,1 times the throughput of the 15 ppm bilge separator.

**5.2.6** Provision shall be made for the drainage of the 15 ppm bilge separator.

**5.2.7** When the oily mixture shall be heated in the 15 ppm 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.

**5.2.8** The 15 ppm bilge separator shall be so designed that it functions automatically.

However, fail-safe arrangements shall be provided to avoid any discharge in case of malfunction.

There shall be no need for any adjustment to valves or other equipment to bring the 15 ppm bilge separator into operation. The equipment shall be capable of operating for at least 24 hours of normal duty without attention.

**5.2.9** Changing the feed to the 15 ppm bilge separator (from oily bilge water to oil, oily bilge water to emulsified bilge water, or from oil and/or eater to air) shall not result in the discharge overboard of any oily mixture containing more than 15 ppm of oil.

**5.2.10** The 15 ppm bilge separators, pumps and other equipment shall be fitted with pressure, temperature and level gauges, and an alarm and protection system shall be provided.

**5.2.11** If a centrifugal separator is incorporated in the 15 ppm 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

**5.2.12** Where there is a possibility of oil residues (sludge) leakage, the 15 ppm 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.

**5.2.13** In a vertical section of the piping for discharge of purified water, after the 15 ppm bilge separator, provision shall be made for a sampling arrangement as close as practicable to the 15 ppm bilge separator outlet. The design of the sampling arrangement shall correspond to the design shown in Fig. 5.2.13.

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

**5.2.15** The electronic units of the 15 ppm bilge separator shall comply with the provisions of 5.2.3.

**5.2.16** Re-circulating facilities shall be provided, after and adjacent to the overboard outlet of the stopping device, to enable the 15 ppm bilge separator system, including the 15 ppm bilge alarm and the automatic stopping device, to be tested with the overboard discharge closed.

**5.2.17** The pipeline for discharge of purified water after the 15 ppm bilge separator shall not have connections with bilge (including oily bilge water pipeline system) and ballast system, except for the outlet referred to in 5.2.16 and the re-

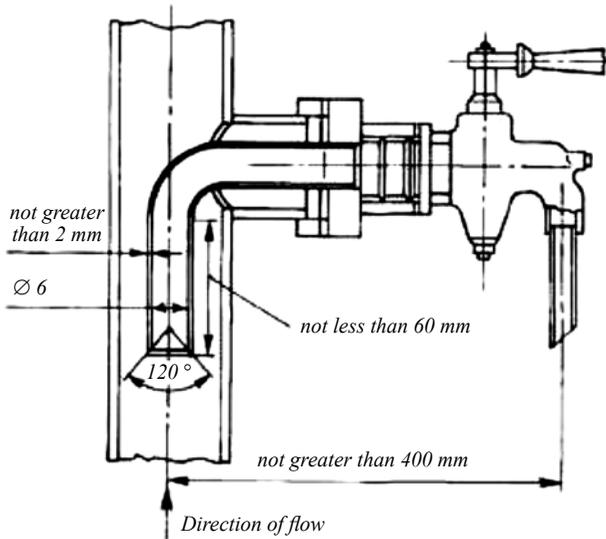


Fig. 5.2.13  
Sampling arrangement for pressure piping

circulation pipeline after automatic stopping device. Re-circulating facilities for oily bilge water shall exclude any by-pass of the 15 ppm bilge separator.

**5.2.18** The 15 ppm bilge separator inlet pipelines shall not have connections with the pipelines of sea water or fresh water systems. The 15 ppm bilge separator pipelines may have connections with the above pipelines for washing purposes in accordance with the approved design of the 15 ppm bilge separator.

**5.2.19** Recommended throughput of the 15 ppm bilge separators depending on the ship's gross tonnage is given in Table 5.2.19.

Table 5.2.19

Ship's gross tonnage	Recommended throughput of the 15 ppm bilge separators (m <sup>3</sup> /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

## **6 THE 15 PPM BILGE ALARM**

### **6.1 GENERAL**

**6.1.1** The 15 ppm bilge alarm shall be fitted in accordance with regulation 14 of Annex I to MARPOL 73/78:

on any ship of 10 000 gross tonnage and above;

on any ship of 400 gross tonnage and above, but less than 10 000 gross tonnage, which carries water ballast in oil fuel tanks;

on any ship of 400 gross tonnage and above, but less than 10 000 gross tonnage, if the 15 ppm bilge separator needs to be used during voyages within the special areas as defined in MARPOL 73/78.

**6.1.2** The 15 ppm bilge alarm shall be so designed as to comply with the provisions of the applicable IMO Resolutions (A.393(X), MEPC.60(33), MEPC.107(49)) and the provisions of 6.2.

**6.1.3** Ships fitted with the 15 ppm bilge alarm shall be provided with an automatic stopping device meeting the provisions of Section 7.

### **6.2 TECHNICAL REQUIREMENTS OF THE NORMATIVE DOCUMENTS**

**6.2.1** The 15 ppm bilge alarm shall have type approval according to Resolution MEPC.107(49) (considering the provisions of MEPC.1/Circ.643) in the following cases:

**.1** the 15 ppm bilge alarm is fitted on ships, the keels of which are laid on or after 1 January 2005;

**.2** the 15 ppm bilge alarm is ordered on or after 1 January 2005, for fitting on ships, the keels of which are laid before that date (refer to MEPC/Circ.420).

**6.2.2** The 15 ppm bilge alarm shall resist corrosion in conditions of the marine environment. The 15 ppm bilge alarm shall not contain or use any substance of a dangerous nature, unless adequate arrangements, approved by the Register, are provided to eliminate any hazards introduced thereby.

**6.2.3** The 15 ppm bilge alarm shall, if intended to be fitted in locations where flammable atmosphere may be present, comply with the requirements of 2.9, Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships. Any moving parts of the 15 ppm bilge alarm, which are fitted in hazardous areas, shall be so designed to avoid the formation of static electricity.

**6.2.4** The 15 ppm 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.

**6.2.5** The response time of the 15 ppm bilge alarm, that is, the time, which elapses between an alteration in the sample being supplied to the 15 ppm bilge alarm and ppm display showing the correct response, shall exceed 5 s.

**6.2.6** The 15 ppm bilge alarm shall be fitted with an electrical/electronic device, which shall be pre-set by the manufacturer to activate when the effluent exceeds 15 ppm with simultaneous provision of a command signal to the automatic stopping device to discontinue discharge overboard. This shall also operate automatically if at any time the 15 ppm bilge alarm fails to function, requires a warm-up period or otherwise is de-energized.

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

**6.2.8** The 15 ppm bilge alarm shall record date, time and alarm status, and operating status of the 15 ppm bilge separator. The recording device shall also store data for at least eight months and shall be able to display or print a protocol for official inspections as required. In the event the 15 ppm bilge alarm is replaced, means shall be provided to ensure the data recorded remains available on board for 18 months.

**6.2.9** To avoid willful manipulation of the 15 ppm bilge alarms, the following items shall be included:

**.1** every access of the 15 ppm bilge alarm beyond the operations specified in 6.2.7 requires the breaking of the seal; and

**.2** the 15 ppm bilge alarm shall be designed so that the alarm is always activated whenever clean water is used for cleaning or zeroing purposes.

**6.2.10** The accuracy of the 15 ppm bilge alarm shall be within  $\pm 5$  ppm, and it shall be checked at a renewal surveys according to the manufacturers instructions. The calibration certificate for the 15 ppm bilge alarm, certifying date of last calibration check, shall be retained onboard. The calibration of 15 ppm bilge alarms may be performed by the manufacturer or persons authorized by the manufacturer.

**6.2.11** The 15 ppm bilge alarm shall be installed in the ship relative to the 15 ppm bilge separator so that the overall response time (including the response time of the 15 ppm bilge alarm) between an effluent discharge from the 15 ppm bilge separator exceeding 15 ppm, and the operation of the automatic stopping device preventing overboard discharge, shall be as short as possible and in any case not more than 20 s.

**6.2.12** The arrangement on board ship for the extraction of samples from the 15 ppm bilge separator discharge line to the 15 ppm bilge alarm shall give an adequate pressure and flow.

## **7 AUTOMATIC STOPPING DEVICE**

**7.1** The automatic stopping device shall stop any discharge overboard of oily mixture when the 15 ppm bilge alarm referred to in 6.2 activates.

**7.2** The automatic stopping device shall consist of a valve arrangement installed in the effluent outlet line of the 15 ppm bilge separator, which automatically diverts the effluent mixture from being discharged overboard back to the ship's bilges or oily bilge water holding tanks when the oil content of the effluent exceeds 15 ppm.

## **8 OIL DISCHARGE MONITORING AND CONTROL SYSTEM**

### **8.1 GENERAL**

**8.1.1** In accordance with regulation 31 of Annex I to MARPOL 73/78, oil tankers of 150 gross tonnage and above, as well as FPU (FPSO and FSO) shall be equipped with an approved oil discharge monitoring and control system, except for cases specified in regulation 3 of this Annex. Application of the above regulation for FPSO and FSO shall be considered as regards fulfillment of regulation 34 of Annex I to MARPOL 73/78. If all oily mixtures are discharged from FPSO and FSO into reception facilities the oil discharge monitoring and control system is not required.

The oil discharge monitoring and control system is a system which monitors the discharge into the sea of oily ballast water or other oily bilge water from the cargo tank areas.

**8.1.2** The requirements to discharge when using the oil discharge monitoring and control system are defined in regulation 34 of Annex I to MARPOL 73/78.

### **8.2 TECHNICAL REQUIREMENTS OF THE NORMATIVE DOCUMENTS**

**8.2.1** The technical requirements in accordance with the provisions of Resolution MEPC.108(49) shall apply to the oil discharge monitoring and control system.

**8.2.2** The above Resolution MEPC.108(49) apply to equipment installed in oil tankers the keels of which are laid on or after 1 January 2005. The oil tankers constructed before this date shall comply with IMO Resolutions A.393(X), A.496(XII) MEPC.13(19) and A.586(14).

**8.2.3** The oil discharge monitoring and control system shall come into operation when there is any discharge of effluent into the sea and shall be such that

will ensure that the discharge of oily mixture is automatically stopped when the instantaneous rate of discharge of oil exceeds that permitted by regulation 34 of Annex I to MARPOL 73/78.

**8.2.4** The oil discharge monitoring and control system shall function effectively under all environment conditions which oil tankers are normally assumed to encounter. The oil discharge monitoring and control system shall be designed and constructed to meet the requirements for reliable performance in climatic conditions and under mechanical effects specified in 2.1, Part XI “Electrical Equipment” of the Rules for the Classification and Construction of Sea-Going-Ships.

**8.2.5** The oil discharge monitoring and control system shall comprise the equipment specified in paragraph 6.1.4 of Resolution MEPC.108(49), including an oil content meter. The meter shall be approved in accordance with the provisions of this Resolution, and shall be issued the Type Approval Certificate specifying the range of cargoes carried.

**8.2.6** Any failure of the oil discharge monitoring and control system shall stop the discharge. In the event of failure of oil discharge monitoring and control system the manually operated alternative method may be used.

### **8.3 OIL CONTENT METER**

**8.3.1** The accuracy of oil content meters designed shall be such that the reading will represent the actual oil content of the sample being tested within  $\pm 10$  ppm or  $\pm 10$  per cent, whichever is greater. The accuracy shall remain within the above limit despite the presence of contaminants other than oil, such as entrained air, rust, mud and sand.

**8.3.2** The meter shall be designed so that it functions within the above limit when the power supply (in the form of electricity, compressed air, etc.) is varied by  $\pm 10$  per cent, from the value for which the meter is designed.

**8.3.3** It shall not be necessary to calibrate the meter on board ship in case of change of oil type, but pre-set alterations in the calibration may be made in accordance with the manufacturer’s instructions. The accuracy of the readings shall at all times remain within the limit specified in 8.3.1.

**8.3.4** The response time of the meter shall not exceed 20 s.

**8.3.5** The meter may have several scales as appropriate for its intended use. The full range of the scale shall not be less than 1000 ppm.

**8.3.6** The meter shall have simple means to enable the ship’s crew to check its functioning by introduction of a simulated signal corresponding approximately to half the full-scale reading of the meter.

**8.3.7** The meter or any electrical equipment, which is part of the meter, shall, if intended to be fitted in locations where flammable atmospheres may be present, comply with the requirements of 19.2, Part XI “Electrical Equipment” of the Rules for the Classification and Construction of Sea-Going Ships. Any moving parts, which are fitted in hazardous areas, shall be so arranged as to avoid the formation of static electricity.

**8.3.8** The meter shall not contain or use any substance of a dangerous nature, unless adequate safety arrangements, approved by the Register, are provided.

**8.3.9** The meter shall resist corrosion in conditions of the marine environment.

**8.3.10** The meter shall be constructed from materials compatible with oily mixtures.

## **9 OIL/WATER INTERFACE DETECTORS**

**9.1** In accordance with regulation 32 of Annex I to MARPOL 73/78, oil tankers of 150 gross tonnage and above, as well as MODU, FOP and FPU shall be provided with oil/water interface detectors for a rapid and accurate determination of the oil/water interface in slop tanks, except for cases specified in regulation 3 of this Annex. For FPSO and FSO the detector is not required if all oily mixtures are discharged into reception facilities.

**9.2** The technical requirements in accordance with the provisions of Resolution MEPC.5(XIII) shall apply to oil/water interface detectors. The detector shall be approved in accordance with the provisions of this Resolution and shall have Type Approval Certificate.

**9.3** The oil/water interface detectors may be permanently installed or portable. When only permanently installed detectors are used, each slop tank shall be provided with such a detector.

**9.4** The interface detectors shall be capable of detecting the vertical position of the oil/water interface at any level in the tank.

**9.5** The position of permanently installed equipment or access openings for portable equipment shall be selected with due regard for the tank structure and ship motions.

**9.6** The control and display units of permanently installed oil/water interface detectors shall be located in the cargo control room or similar space.

**9.7** Permanently installed detectors shall withstand the impact from the jets of tank washing equipment.

**9.8** The detector shall be designed so as to determine interfaces of liquids having a wide range of density differences. The detector shall be provided with a plate indicating the conditions of application and limitations imposed.

**9.9** The detector shall be so designed that it can be installed in a dangerous space. The detector shall not interfere with radio communication.

**9.10** The detector shall be practical, reliable and constructed of materials suitable for use in the marine environment.

**9.11** The detector shall be capable of reliable operation at ambient temperatures from  $-30$  to  $+50$  °C.

**9.12** The detector shall respond promptly and in a distinctive manner to changes between oil and water.

**9.13** The detector shall be capable of providing an indication of the oil/water interface by means of an indicator. There is no need for continuous indication of the interface position.

**9.14** The accuracy of the detector indication shall be such that it will indicate within  $\pm 25$  mm the actual position of the interface between oil and water.

**9.15** The detector shall be capable of being checked on board for correct working.

## **10 PUMPING, PIPING AND DISCHARGE ARRANGEMENTS FOR OILY MIXTURE**

### **10.1 GENERAL**

**10.1.1** Oily mixture pumping, piping and discharge arrangements, hydraulic tests of the pipes and fittings shall meet the requirements of Part VIII “Systems and Piping” of the Rules for the Classification and Construction of Sea-Going Ships.

### **10.2 REQUIREMENTS OF THE NORMATIVE DOCUMENTS FOR PUMPING, PIPING AND DISCHARGE ARRANGEMENTS FOR OILY MIXTURE**

#### **10.2.1 Oil tankers.**

**10.2.1.1** Equipment and arrangements for the discharge to the sea of ballast water or oily bilge water from cargo tank areas of oil tankers, as well as ships fitted with cargo spaces which are constructed and utilized to carry oil in bulk of aggregate capacity of 2000 cubic metres or more, as well as FPU (FPSO and FSO)

shall comply with the requirements of regulation 30 of Annex I to MARPOL 73/78 and include the following:

.1 discharge manifolds for the discharge of oily mixtures (oily ballast water, washing water, etc.) to reception facilities located on the open deck on both sides of the ship (for FPSO and FSO a manifold may be available at least at a single point);

.2 pipelines for the discharge to the sea of the ballast water or oily bilge water from cargo tank areas above or below the waterline in the deepest ballast condition depending upon the conditions referred to in this regulation (not applicable to FPSO and FSO);

.3 means for stopping the discharge into the sea of ballast water or oily bilge water from cargo tank areas;

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

.5 stripping devices;

.6 part flow arrangements for control of ballast water or oily bilge water discharge from cargo tank areas;

.7 sea chests with valves connected to the cargo pipeline systems with use of a positive means.

#### **10.2.2 All ships including oil tankers.**

**10.2.2.1** In every ship provision shall be made for a pipeline to discharge oily 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 regulation 13 of Annex I to MARPOL 73/78 (Fig. 10.2.2.1). The pipeline shall be led to both sides of the ship.

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.

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

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

**10.2.2.4** 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.

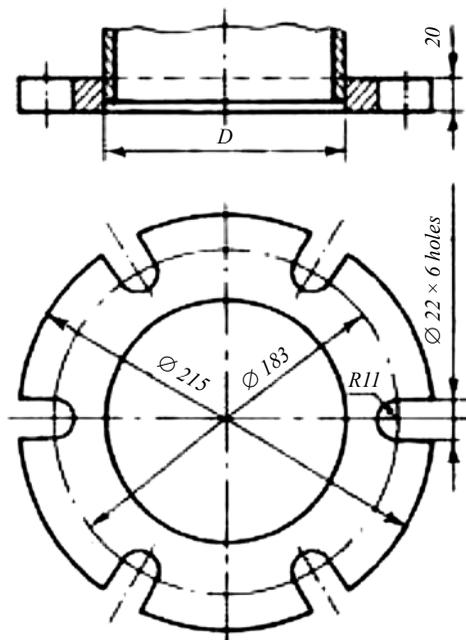


Fig. 10.2.2.1

**Note.** The flange is designed to accept pipes up to a maximum internal 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 period of 0,6 MPa. The flange is connected by six bolts of suitable length and of 20 mm in diameter each.

## 11 HOLDING TANKS

### 11.1 OILY BILGE WATER HOLDING TANKS

**11.1.1** If oily bilge water holding tank (tanks) for machinery spaces is arranged, it shall be of sufficient capacity to provide to the ship the flexibility of operation in ports, coastal waters and special areas to prevent unauthorized discharge of oily mixtures into the sea.

In accordance with MEPC.1/Circ.642 the recommended capacity of oily bilge water holding tank (tanks) for machinery spaces shall be determined by the formulae given in Table 11.1.1.

Table 11.1.1

Main engine rating $P$ , kW	Capacity of tank, m <sup>3</sup>
Up to 1000	4,0
1 000 to 20 000	$P/250$
Above 20 000	$40 + P/500$

**11.1.2** If a ship is exclusively engaged in voyages within special areas as defined in Annex I to MARPOL 73/78, the Administration may waive the requirements for the ship fitting with filtering equipment. In this case, when determining oily bilge water holding tank (tanks) capacity, absence of this equipment shall be taken into consideration.

The calculation of the total capacity of oily bilge water holding tanks, approved by the customer, with regard to the intended area of navigation and service conditions of the ship shall be submitted to the Register.

**11.1.3** Any MODU, FOP and FPU shall be equipped with oily bilge water holding tank (tanks) for machinery spaces whose capacity calculations shall be submitted to the Register for consideration. The capacity of the above tanks shall comply with Table 11.1.1, where  $P$  means the main engine rating of MODU/drilling ship/FPU or the total power of driving engines of the FOP main electrical power source.

## 11.2 OIL RESIDUES (SLUDGE) TANKS

**11.2.1** In accordance with regulation 12 of Annex I to MARPOL 73/78 any ship of 400 gross tonnage and above shall be provided with a tank or tanks, having regard to the type of machinery and length of voyage, to receive oil residues (sludge) the minimum capacity of which, in m<sup>3</sup>, shall be calculated by the formulae:

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

$$V_1 = K_1 CD \tag{11.2.1.1}$$

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 is purified for main engine use;

0,005 – for ships using diesel oil or heavy fuel oil which does not require purification before use;

- $C$  = daily oil fuel consumption, in  $m^3$ ;  
 $D$  = maximum duration of voyage between ports, where oil residues (sludge) may be discharged into reception facilities, in days (where the duration of voyage is not known it shall be adopted equal to 30 days);

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

$V_1 = 50$  per cent of the value stipulated under 11.2.1, 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 greater;

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

$$V_2 = V_1 + K_2 B \quad (11.2.1.3)$$

where  $F_1$  = refer to 11.2.1.1 or 11.2.1.2

$K_1$  = factor equal to:

0,01 for heavy fuel oil bunker tanks;

0,005 for diesel oil bunker tanks;

$B$  = capacity of ballast water tanks, which can also be used to carry oil fuel, in t.

**11.2.2** The pipeline system of tank or tanks, referred to in 11.2.1 shall be provided with a special pump intended to discharge the contents into reception facilities, which shall comply with the requirements of 11.2.10. Starting and stopping of the special pump shall be effected according to 10.2.2.3.

**11.2.3** The pump discharge pipelines of the system referred to in 11.2.2 shall not be connected to the oily bilge water piping except for the common pipeline running to the standard discharge connections specified in 10.2.2.1, as well as to oily bilge water holding tanks, bilges of machinery spaces or 15 ppm bilge separators.

However, arrangements may be provided to discharge settled water from oil residues (sludge) tanks to oily bilge water holding tanks by means of manually operated self-closing valve with the possibility to visually observe the discharge or of similar arrangements (provided oil residues (sludge) tanks are located above oily bilge water holding tanks).

**11.2.4** Piping to and from oil residues (sludge) tanks shall have no direct connection overboard, other than the common pipeline to standard discharge connections in accordance with 10.2.2.1.

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

**11.2.6** In accordance with MEPC.1/Circ.642 an independent tank may be provided for collection of separated sludge. The accumulated oil as a result of the 15 ppm separator operation may also be discharged to this tank.

**11.2.7** 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 draining facilities specified in 11.2.3.

**11.2.8** Whenever possible, the separated sludge tank shall be located below the heavy fuel oil purifier. If this is not possible, the separated sludge tank shall be located close to the heavy fuel oil purifier in such a way that the discharge line to the tank can be installed at the maximum gradient. The pipelines shall, wherever possible, be straight or fitted with large radius elbows.

**11.2.9** The oil residues (sludge) pump suction pipeline shall be as short as possible. The oil residues (sludge) tank shall be designed so that oil residues (sludge) have free access to the suction line. The suction opening or the submersible pump shall be arranged so that the oil residues (sludge) path to the suction opening is as short as possible.

**11.2.10** The pump suitable for use with high viscosity oil residues (sludge) shall be self-priming displacement pump with suitable means for protection against dry running and shall have a sufficient total head and delivery rate.

In any case the pump delivery rate shall not be less than the value when the tank discharge is provided within 4 to 8 hours. The pressure side of the pump shall only be connected to the standard connection on deck and to oil residues (sludge) tanks and to oil residues (sludge) incinerators specified in the Supplement (Form 2.4.20 or 2.4.26) to the International Oil Pollution Prevention Certificate (Form 2.4.5).

### **11.3 CONSTRUCTION AND EQUIPMENT OF HOLDING TANKS**

**11.3.1** Holding tanks may be built-in or independent. The equipment of holding tanks shall comply with the requirements of MEPC.1/Circ.642.

**11.3.2** The holding tank shall be provided with:

- .1** an access hole for inspection and cleaning;
- .2** an air pipe;

.3 a heating system according to 11.3.4 if heavy fuel oil is used on board;

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

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

**11.3.4** Separated sludge tanks (irrespective of the fuel relative density) shall be equipped with tank heating systems. 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 sludge up to 60 °C.

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

**11.3.5** Access holes of the oil residues (sludge) tank shall be arranged so that all areas of the tank can be cleaned. An access hole shall be sited on top of the tank to facilitate the use of a portable pump.

**11.3.6** The top of oil residues (sludge) tanks shall be fitted with steaming-out lines for cleaning.

**11.3.7** Ships intended for operation with heavy fuel oil of a relative density greater than 0,94 at 15 °C shall be provided with oily bilge water holding tank (tanks) fitted with heating facilities to preheat the oily mixture prior to the discharge of the tank (tanks) contents through the 15 ppm bilge separator.

## **12 OTHER MEANS FOR REMOVAL OF OIL RESIDUES (SLUDGE)**

**12.1** Other means for removal of oil residues (sludge) include oil residues (sludge) incinerators referred to in Section 1.

**12.2** Oil residues (sludge) incinerator systems shall consist of the following:  
steam boiler or heater of thermal liquid systems, or incinerator;  
oil residues (sludge) processing system.

**12.3** Oil residues (sludge) processing system shall consist of the following:  
a tank for mixing oil residues (sludge) with oil fuel (mixing tank);  
oil residues (sludge) preheating systems;  
filter;  
homogenization systems.

**12.4** The mixing tank shall be equipped with suitable drainage facilities and a oil fuel supply connection shall be provided.

**12.5** The homogenization system shall assure that the entire contents of the mixing tank are processed into homogeneous and combustible mixture. This system shall be put into operation following adequate draining of the tank. A device for continuous indication and monitoring of the water content in oil residues (sludge) shall be provided.

## **13 OIL FUEL TANKS PROTECTION**

### **13.1 DEFINITIONS AND EXPLANATIONS**

**13.1.1** A ship delivered on or after 1 August 2010 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 February 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 those work, corresponding to the above dates during the construction accordingly.

Small oil fuel tank means an oil fuel tank with a maximum individual capacity not greater than 30 m<sup>3</sup>.

Skeg means a structure of the ship keel extending below the moulded line of the bottom shell plating.

### **13.2 REQUIREMENTS OF THE NORMATIVE DOCUMENTS FOR OIL FUEL TANKS AND THEIR PIPELINES**

**13.2.1** On ships delivered on or after 1 August 2010, as defined in 13.1.1, oil fuel tanks shall be located as follows:

for ships having an aggregate oil fuel capacity of 600 m<sup>3</sup> and above, oil fuel tanks shall be located above the moulded line of the bottom shell plating at a distance in accordance with regulation 12A(6) of Annex I to MARPOL 73/78;

for ships having an aggregate oil fuel capacity of 600 m<sup>3</sup> or more but less than 5000 m<sup>3</sup>, oil fuel tanks shall be located inboard of the moulded line of the side shell plating at a distance in accordance with regulation 12A(7) of Annex I to MARPOL 73/78;

for ships having an aggregate oil fuel capacity of 5000 m<sup>3</sup> and above, oil fuel tanks shall be located inboard of the moulded line of the side shell

plating at a distance in accordance with regulation 12A(8) of Annex I to MARPOL 73/78.

**13.2.2** The provisions of regulation 12A of Annex I to MARPOL 73/78 shall apply to FPU except paragraph 6 of the said regulation. However, in any voyage from the place of operation for any purpose, double bottom oil fuel tanks shall be void if they are not in compliance with the requirements of paragraph 6 of regulation 12A.

**13.2.3** The provisions of regulation 12A apply to all oil fuel tanks except small oil fuel tanks, provided that the aggregate capacity of such tanks is not greater than 600 m<sup>3</sup>.

**13.2.4** Individual oil fuel tanks shall not have a capacity of over 2500 m<sup>3</sup>.

**13.2.5** Suction wells in oil fuel tanks shall comply with regulation 12A(10) of Annex I to MARPOL 73/78. In addition to being as small as practicable, the size of the suction wells mentioned in regulation 12A(10) of Annex I to MARPOL 73/78, shall be appropriate to the size of the suction pipe and area covered.

**13.2.6** Oil fuel piping shall comply with regulation 12A(9) of Annex I to MARPOL 73/78.

In this case, the provisions of regulation 12A(10) of Annex I to MARPOL 73/78 as regards location of suction wells in oil fuel tanks may be similarly applied to the location of valves in pipelines of oil fuel tanks, namely, these valves may be located at a distance of not less than  $h/2$  from the bottom shell plating (refer to Fig. 13.2.6).

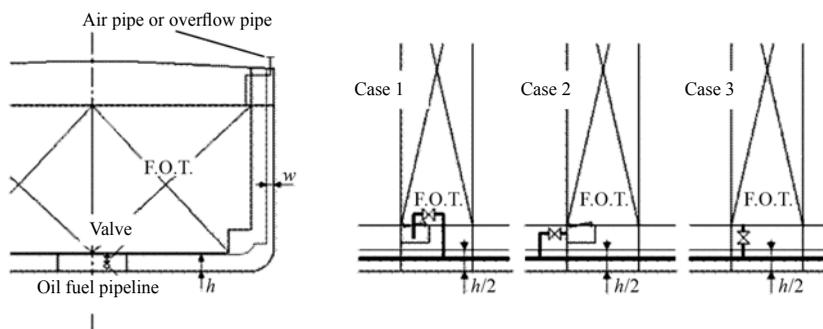


Fig. 13.2.6:

$h$  means the minimum distance of oil fuel tanks location from the moulded line of the bottom shell plating according to regulation 12A(6) of Annex I to MARPOL 73/78, in m;

$w$  means the minimum distance of oil fuel tanks location from the moulded line of the side shell plating according to regulation 12A(7) or 12A(8) of Annex I to MARPOL 73/78, in m;

F.O.T. means an oil fuel tank

Valves in pipelines of oil fuel tanks may be located at a distance from the ship's bottom or side shell plating of less than  $h$  and  $w$  respectively, provided that the accidental oil fuel outflow performance standard, as defined in regulation 12A(11) of Annex I to MARPOL 73/78, is complied with.

Air or overflow pipes of oil fuel tanks shall not be considered as part of oil fuel piping, and therefore may be located at a distance of less than  $w$  from the side shell plating (refer to Fig. 13.2.6).

**13.2.7** The distance  $h$  shall be measured from the moulded line of the bottom shell plating at right angles thereto.

**13.2.8** For ships designed with a skeg, it shall not be considered as providing oil fuel tanks protection. For the area within the skeg breadth the distance  $h$  shall be measured at right angles to the line parallel to the base line, at the intersection of the skeg and moulded line of the bottom shell plating as shown in Fig. 13.2.8.

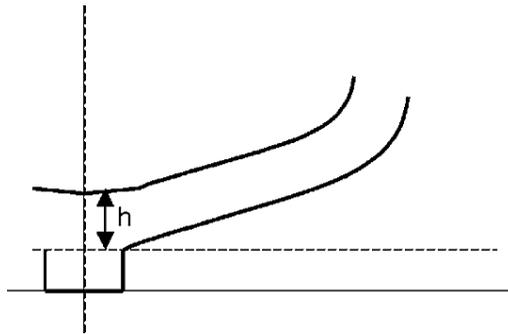


Fig. 13.2.8

**13.2.9** For ships designed with constant trim, the base line shall not be used as a reference point. The distance  $h$  shall be measured at right angles to the moulded line of the bottom shell plating at the relevant frames where oil fuel tanks protection shall be provided.

**13.2.10** When the distances  $h$  and  $w$  are different, the distance  $w$  shall have preference at levels exceeding  $1,5h$  above the base line.

For ships designed with the bottom rise, the distance  $1,5h$  shall be measured from the moulded line of the bottom shell plating but at right angles to the base line as shown in Fig. 13.2.10.

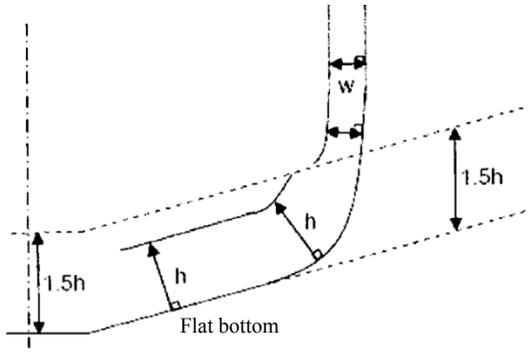


Fig. 13.2.10

**13.2.11** The distance  $h$  referred to in regulation 12A(11)(8) of Annex I to MARPOL 73/78 shall be measured as specified in 13.2.9 and 13.2.10.

#### **14 APPLICATION OF THE REQUIREMENTS OF ANNEX I TO MARPOL 73/78 FOR MODU, FOP AND FPU**

**14.1** MODU, FOP and FPU shall comply with the requirements of Annex I to MARPOL 73/78 applicable to ships of 400 gross tonnage and above other than oil tankers, except for specified in regulation 39.2 of this Annex.

**14.2** In survey of FPU for compliance with Annex I to MARPOL 73/78, in addition to the requirements of regulation 39.2 of this Annex, the provisions of the Guidelines for the Application of the Revised Annex I to MARPOL 73/78 Requirements to FPSO and FSO, in accordance with Resolution MEPC.139(53), as amended according to Resolution MEPC.142(54), shall be taken into consideration.

**14.3** FPU (FPSO and FSO) shall not be considered as offshore terminals and are not intended for reception of contaminated ballast and washing water from tankers under loading or unloading operations.

**15 APPLICATION OF THE REQUIREMENTS OF ANNEX I  
TO MARPOL 73/78 FOR OIL TANKERS OF LESS THAN 150 GROSS  
TONNAGE AND OTHER SHIPS OF LESS THAN 400 GROSS  
TONNAGE IN ALL AREAS**

**15.1** On each oil tanker of less than 150 gross tonnage and FPU (FPSO and FSO), and on each other ship of less than 400 gross tonnage, the Administration shall take adequate measures to ensure that the applicable provisions of Annex I to MARPOL 73/78 are complied with.

**15.2** In accordance with regulation 14.4 of Annex I to MARPOL 73/78 the Administration shall ensure that ships of less than 400 gross tonnage are equipped, as far as practicable, to retain onboard oil or oily mixtures (a holding tank of sufficient capacity and a pipeline for discharge of oily mixtures to reception facilities with standard discharge connections) or discharge them in accordance with the requirements of regulation 15.6 of this Annex, namely: the discharge of oily mixtures is carried out through 15 ppm separators approved by the Administration provided the ship is proceeding en route.

**15.3** For a ship of less than 400 gross tonnage flying the flag of the Russian Federation, which is equipped at least with an oil residues (sludge) tank (tanks) of sufficient capacity and pipelines for discharge of oil residues (sludge) and oily bilge water to reception facilities with standard discharge connections as specified in 10.2.2.1, the Register may issue the Oil, Sewage and Garbage Pollution Prevention Certificate (Form 2.4.18) upon the results of relevant surveys (provided the requirements of Annexes IV and V to MARPOL 73/78 are complied with, if applicable).

**15.4** For oil tankers of less than 150 gross tonnage and FPU (FPSO and FSO) the requirements of regulation 29 (slop tanks), regulation 31 (oil discharge monitoring and control system) and regulation 32 (oil/water interface detector) of Annex I to MARPOL 73/78, shall not apply, provided that oil is retained on board with subsequent discharge of all contaminated washing water to the reception facilities.

**15.5** In addition to the provisions of 15.3, for an oil tanker of less than 150 gross tonnage flying the flag of the Russian Federation, which is equipped at least on both sides of the open deck with discharge manifolds for connection to reception facilities for discharge of oily ballast water or oily bilge water, the Register may issue the Oil, Sewage and Garbage Pollution Prevention Certificate (Form 2.4.18) upon the results of relevant surveys (provided the requirements of Annexes IV and V to MARPOL 73/78, if applicable).

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

## **1 DEFINITIONS AND EXPLANATIONS**

**1.1** In the present Part the following definitions and explanations have been adopted.

**Noxious liquid substances** mean substances of Categories X, Y, Z or OS indicated in the pollution category column of Chapter 17 or Chapter 18 of the IBC Code.

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

**Other substances** mean substances indicated as OS (other substances) in the pollution category column of Chapter 18 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk have been evaluated and found to fall outside Category X, Y and 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.

**Liquid substance** means substance having a vapour pressure not exceeding 0,28 MPa absolute at a temperature of 37,8 °C.

**Solidifying substance** means a noxious liquid substance, which:  
in the case of a substance with a melting point of less than 15 °C which is at a temperature of less than 5 °C above its melting point at the time of unloading; or

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

**Segregated ballast** means ballast water introduced into a tank permanently allocated to the carriage of ballast or cargoes other than oil or noxious liquid substances, and which is completely separated from the cargo and fuel oil systems.

**Category 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.

**L o w - v i s c o s i t y s u b s t a n c e** means a noxious liquid substance, which is not a high-viscosity substance.

**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.

**N o n - s o l i d i f y i n g s u b s t a n c e** means a noxious liquid substance, which is not a solidifying substance.

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

**A s s o c i a t e d p i p i n g** means the pipeline from the suction point in a cargo tank to the shore connection used for unloading the cargo and includes all ship’s piping, pumps and filters which are in open connection with the cargo unloading line.

**R e s i d u e / w a t e r m i x t u r e** means residue, to which water has been added for any purpose (e.g. tank cleaning, ballasting, oily bilge slops).

**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 TYPES AND SCOPE OF SURVEYS**

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

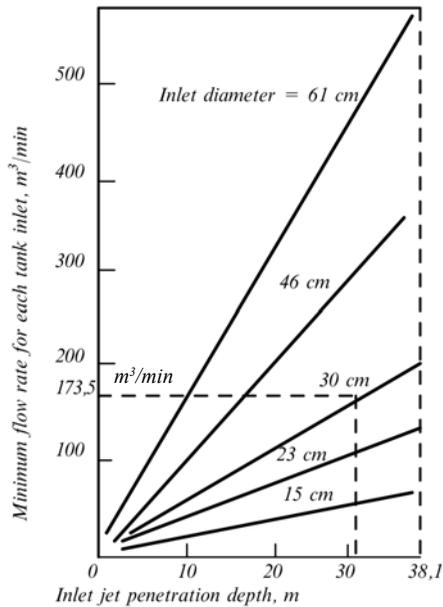


Fig. 4.1.2.1  
Minimum flow rate as function of jet penetration depth

### 3 CONSTRUCTION OF SHIPS CARRYING NOXIOUS LIQUID SUBSTANCES IN BULK

#### 3.1 GENERAL

**3.1.1** The construction of chemical tankers and NLS tankers shall comply with the requirements of the revised texts of Annex II to MARPOL 73/78, the IBC Code, as well as the Rules for the Classification and Construction of Chemical Tankers.

**3.1.2** The requirements for construction and equipment of ships carrying dangerous and noxious substances in bulk other than chemical tankers and bulk carriers for the carriage of noxious liquid substances are given in Section 6.

## **4 REQUIREMENTS OF THE NORMATIVE DOCUMENTS 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 12, Part VIII “Systems and Piping” of the Rules for the Classification and Construction of Sea-Going Ships.

**4.1.2** The characteristics and arrangement of the ventilation equipment shall comply with the following requirements.

**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 jet penetration depth is shown in Fig. 4.1.2.1.

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

**4.1.2.3** Ventilation equipment shall, when practicable, be positioned so that the air jet is directed at the tank swamp 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.

### **4.3 DISPOSAL SYSTEMS FOR NOXIOUS LIQUID SUBSTANCES RESIDUES**

**4.3.1** The equipment and systems for pumping and discharge of noxious liquid substances residues shall preclude the possibility of their discharge exceeding the specified values.

**4.3.2** 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.

**4.4.2** The cargo system used for unloading of 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 residue 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 measurement, show that the system meets the above requirements.

## 4.5 UNDERWATER DISCHARGE OUTLET LOCATION

**4.5.1** The underwater discharge outlet (or outlets) for the residue/water mixture discharge shall be located below the waterline (at any operation draughts) within the cargo area in the vicinity of the bilge. If dual outlets are provided, they shall be located on the opposite sides of the ship, as specified above.

**4.5.2** The underwater discharge outlet (or outlets) shall be so arranged so as to avoid the re-intake of residue/water mixtures by the ship’s pumps through sea-water intakes.

## 4.6 UNDERWATER DISCHARGE OUTLET SIZE

**4.6.1** 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 governed by the formula:

$$D = Q_d / 5 L_d \quad (4.6.1)$$

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 discharge rate selected at which the ship may discharge a residue/water mixture through the outlet, in m<sup>3</sup>/h.

When the discharge is directed at an 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.

## 4.7 SLOP TANKS

**4.7.1** Though a ship is not required to be fitted with separate slop tanks, they may be required for some washing operations. Cargo tanks may be used as slop tanks.

## 5 CARRIAGE OF VEGETABLE OILS

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

As specially decided by the Administration, the carriage of vegetable oils may be permitted on ships meeting all 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 shell 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 m at the centreline, whichever is the lesser. The minimum distance shall be 1 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, specifically 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 indication of pollution hazard only.

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

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

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

**5.2.2** Every such dry cargo ship shall meet the requirements of Annex II to MARPOL 73/78 regarding the discharge requirements and the availability of the relevant Manual.

## **6 REQUIREMENTS OF THE NORMATIVE DOCUMENTS FOR THE EQUIPMENT OF SHIPS OTHER THAN CHEMICAL TANKERS**

### **6.1 GENERAL**

**6.1.1** Ships other than chemical tankers or bulk carriers for the carriage of noxious liquid substances (supply vessels for MODU and FOP; dry cargo ships certified to carry vegetable oils in bulk) shall comply with the applicable provisions of Resolution A.673(16), as amended in accordance with Resolution MSC.236(82), and Resolution MEPC.148(54).

**6.1.2** Construction and equipment of ships other than chemical tankers or bulk carriers for the carriage of noxious liquid substances, which carry noxious liquid substances in bulk shall be such as to minimize uncontrolled discharge of such substances into the sea.

**6.1.3** A technical justification, agreed with the shipowner, of the possibility and conditions of carriage of noxious liquid substances in bulk by the ship shall be submitted to the Register for approval. The technical justification shall consider the category of the substance to be carried, equipment available on board and shall contain a list of specifications and practical requirements to be complied with on ships carrying noxious liquid substances, which are indicated in the IBC Code.

**6.1.4** The provisions of 6.1.3 may be waived in respect of ships for which the carriage of a particular noxious liquid substance is predestined by their purpose and for which the requirements of 6.1.3 shall be complied with and approved in the ship's design and technical documentation.

**6.1.5** The provisions of the present Part do not cover process discharges of fishing and fish processing vessels, which are the result of fishing products processing, except cod-liver oil discharges. Observance of procedural requirements with regard to these discharges is within the shipowner's competence.

**6.1.6** Fish transport vessels carrying cod-liver oil may be covered by regulation 4.1.3 of Annex II to MARPOL 73/78, according to which the Administration may permit the carriage of vegetable oils and cod-liver oil on type 3 ships, provided the requirements of this Regulation as regards cargo tanks location against the ship's shell plating are complied with.

For fish transport vessels, whose constructional and operational features are such that ballasting of cargo tanks is not required and cargo tanks washing is only required for repair or dry-docking, the Administration, in accordance with regulation 4.4 of Annex II, may allow exemption from the provisions of regulation 12 of

Annex II to MARPOL 73/78 (including underwater discharge outlet), provided the following conditions are complied with:

any effluent from cod-liver oil tank washings is discharged to a reception facility;

the International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk (Form 2.4.7) indicates that each cargo tank is certified for the carriage of cod-liver oil only without intermediate cleaning, as well as the particulars of the exemption;

the ship carries the Procedures and Arrangements Manual approved by the Administration or by the Register on its behalf.

**6.1.7** The requirements may be waived in respect of fishing vessels, the technological equipment of which is intended for the production and storage of cod-liver oil.

However the following conditions shall be complied with:

arrangements for storage and delivery of cod-liver oil shall be approved by the Register within the ship's design;

any discharges of cod-liver oil, including residues of cargo and washing water containing cod-liver oil, except cases specified in regulation 3 of Annex II to MARPOL 73/78;

any effluent from cod-liver oil tank washings is discharged to a reception facility;

the ship carries the Procedures and Arrangements Manual approved by the Register.

The Manual shall contain a technical justification of the possibility and conditions of cod-liver oil storage on board. The technical justification shall consider the equipment available on board and shall contain a list of specifications and practical requirements to be complied with to prevent marine pollution by noxious substances;

cod-liver oil unloading operations shall be recorded in the relevant ship's log book;

the Certificate (Form 2.4.7) is not issued to a fishing vessel. Although, during approval of the Procedures and Arrangements Manual and the ship survey for compliance with the provisions of the Manual, the Report (Form 6.3.10) shall be issued.

## **6.2 CONSTRUCTION AND EQUIPMENT OF SHIPS INTENDED FOR THE CARRIAGE OF NOXIOUS LIQUID SUBSTANCES IN BULK**

**6.2.1** The design and equipment of ships intended for the carriage of particular noxious liquid substances in bulk as the main or additional cargo shall comply

with the applicable requirements of the Rules for the Classification and Construction of Chemical Tankers and of Sections 3 and 4 of the present Part.

**6.2.2** The requirements for ships not intended for the carriage of particular noxious liquid substances are subject to the Register approval in accordance with 6.1.3.

**6.2.3** For the loading, unloading and other operations with noxious liquid substances an independent cargo system shall be provided on board, which shall be served by a separate pump. The necessity of the pump (pumps) operation on a standby basis is within the shipowner's competence.

**6.2.4** The design and laying of cargo system piping shall maximally facilitate the drainage of piping and pumps as a result of the flowing of cargo to the suction point. Where necessary, special drainage facilities shall be provided, which shall remove the drainage to cargo or slop tanks.

**6.2.5** To exclude accidental spillage in way of discharge sockets, provision shall be made for a watching position equipped with a means of remotely switching off the pumping facilities, or for effective communication (such as telephone or radio) between the position for watching the discharge and the control position for pumping facilities.

**6.2.6** For diluting the residues of noxious liquid substances in tanks and for tank washing a special system shall be provided. The piping by which the washing water is led to the tanks, shall be equipped with non-return valves.

**6.2.7** Circulation of the washing water in tanks during the dilution of cargo residues and the discharge of washing water shall be effected by means of a special pump. On agreement with the Register, cargo pumps may be used for that purpose.

**6.2.8** Efficient measures shall be taken for washing cargo system piping.

**6.2.9** Ships certified to carry noxious liquid substances of Categories X, Y and Z shall have an underwater discharge outlet (or outlets). For ships constructed before 1 January 2007, which are certified to carry noxious liquid substances of Category Z, the underwater discharge outlet is not mandatory.

**6.2.10** Noxious liquid substances residues and washing water shall be discharged to reception facilities in accordance with 6.2.5.

**6.2.11** The sockets of cargo discharge piping shall be provided with shut-off valves, reducer and blank flanges. The type of reducer shall be approved by the Register.

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

## **1 DEFINITIONS AND EXPLANATIONS**

**1.1** In the present Part the following definitions and explanations have been adopted.

**I n t e r n a t i o n a l v o y a g e** means a voyage from a country, to which MARPOL 73/78 applies, to a port outside this country or conversely.

**N e w s h i p** means a ship for which the building contract is placed, 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 the date of entry into force of Annex IV to MARPOL 73/78; or the delivery of which is three years or more after the date of entry into force of Annex IV to MARPOL 73/78.

**H o l d i n g t a n k** means a tank for the collection and storage of untreated sewage, activated sludge and pulp from the sewage treatment plant.

**S e w a g e c o m m i n u t i o n a n d d i s i n f e c t i o n s y s t e m** means a plant, in which sewage is disinfected and the solid particles contained therein are comminuted.

**S e w a g e** means:

drainage and other wastes from any form of toilets, urinals and WC scuppers;  
drainage from wash basins, wash tubs and scuppers located in medical premises (dispensary, sick bay, etc.);

drainage from spaces containing living animals;

other waste waters when mixed with the drainages defined above.

**E x i s t i n g s h i p** means a ship, which is not a new ship.

**S e w a g e t r e a t m e n t p l a n t** means a plant, in which sewage is treated and disinfected.

**S e w a g e t r e a t m e n t p l a n t s i n s t a l l e d o n s h i p s o n o r a f t e r 1 J a n u a r y 2 0 1 0 :**

for new ships – plants on ships the keels of which are laid, or which are at the similar stage of construction on or after 1 January 2010;

for existing ships – new plants the date of contract for delivery of which is on or after 1 January 2010, or in the absence of a contract for delivery, new plants which shall be actually delivered on or after 1 January 2010.

**S a n i t a r y a n d d o m e s t i c w a s t e w a t e r s** 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 TYPES AND SCOPE OF SURVEYS**

**2.1** Types and scope of surveys, as well as documents issued by the Register are specified in Part I “Regulations for Technical Supervision”.

**2.2** All ships listed in 1.1.4, Part I “Regulations for Technical Supervision” are subject to surveys in accordance with regulation 4 of Annex IV to MARPOL 73/78.

**2.3** Based on the results of surveys, the International Sewage Pollution Prevention Certificate (Form 2.4.9) shall be issued to ships or renewed in accordance with regulations 5 to 8 of Annex IV to MARPOL 73/78.

## **3 EQUIPMENT FOR SEWAGE STORAGE, TREATMENT AND DISCHARGE**

### **3.1 GENERAL**

**3.1.1** In ships listed in 1.1.4, Part I “Regulations for Technical Supervision”, provision shall be made for equipment of one of the following types:

**.1** sewage treatment plant of the type approved by the Administration;

**.2** sewage comminution and disinfection system approved by the Administration. This system shall be equipped by the means satisfying the requirements of the Administration for temporary sewage storage, when the ship is within the area, where the discharge is prohibited;

**.3** holding tank of the capacity satisfying the requirements of the Administration.

**3.1.2** No discharge of comminuted and disinfected sewage, as well as of untreated sewage, shall be possible in areas where the discharge is prohibited.

**3.1.3** The pipelines, electrical equipment and control devices shall comply with the requirements of Part VIII “Systems and Piping”, Part XI “Electrical Equipment” and Part XV “Automation” of the Rules for the Classification and Construction of Sea-Going Ships as appropriate.

**3.1.4** Equipment for collection, storage, treatment and discharge of sewage from MODU, FOP and FPU shall meet the requirements of Section 3,

Part V “Equipment for Prevention of Pollution” of the Rules for the Equipment of MODU and FOP.

### 3.2 HOLDING TANKS

**3.2.1** The calculation of the total capacity of holding tanks 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.

**3.2.2** Holding tanks shall have construction meeting the Administration requirements.

### 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

$$Q = nq \tag{3.3.1}$$

where  $n$  = number of persons;

$q$  = daily amount of sewage per one person, in l (according to the current standard).

**3.3.2** Technical requirements for sewage treatment plants installed on ships before 1 January 2010 shall be applied in accordance with the provisions of Resolution MEPC.2(VI).

The technical requirements for sewage treatment plants installed on ships on or after 1 January 2010 shall be applied in accordance with the provisions of Resolution MEPC.159(55).

**3.3.3** Efficiency of means for washing and disinfection shall be checked, as well as associated machinery and piping of the plant.

### 3.4 SEWAGE COMMINATION AND DISINFECTION SYSTEMS

**3.4.1** The sewage comminution and disinfection systems shall meet the requirements of 3.3.1 and 3.3.3.

**3.4.2** The holding tanks for temporary storage of sewage associated with the systems shall meet the requirements of 3.2.

**3.4.3** The sewage comminution and disinfection systems shall provide for comminution of particles not exceeding 25 mm in size.

3.4.4 The systems shall ensure a degree of sewage disinfection according to the current international standards.

### 3.5 ARRANGEMENTS FOR SEWAGE DISCHARGE

3.5.1 In every ship provision shall be made (irrespective of availability of sewage treatment plant or sewage holding tank) for a pipeline for discharge of sewage to reception facilities.

The pipeline shall be led to both sides of the ship. In well-grounded cases, in 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; they shall be fitted with standard discharge connections with flanges according to regulation 10 of Annex IV to MARPOL 73/78 (Fig. 3.5.1), as well as shall be provided with nameplates. The discharge manifolds shall be provided with blank flanges.

3.5.2 Starting and stopping of the discharge shall be effected manually. In the vicinity of the discharge manifolds provision shall be made for the discharge

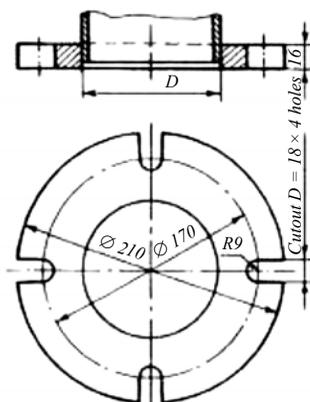


Fig. 3.5.1

Note. The flange is designed to accept pipes up to maximum internal 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 service 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.

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** To provide the discharge of untreated sewage from the ship's holding tanks in the areas, where the discharge is allowed in accordance with regulation 11.1.1 of Annex IV to MARPOL 73/78 (as amended by Resolution MEPC.164(56)), the shipowner shall submit the calculation of the rate of discharge to the Register for review. This calculation shall be prepared on the basis of the requirements of Resolution MEPC.157(55).

The rate of discharge shall be determined based upon the ship's maximum summer draft and maximum service speed.

Where sewage is to be discharged from a holding tank using a pump calibrated at a fixed rate, the pump can either be calibrated at a rate permitted at 4 knots, or calibrated for a specific minimum ship's speed in excess of 4 knots.

Where the sewage pump capacity may be alternating, the rate of discharge may be increased up to the maximum calculated value corresponding to the ship's maximum summer draft and maximum service speed as a result of the pump capacity increase, provided that the ship's speed corresponds to the maximum rate of discharge.

When the above calculation and untreated sewage discharge facilities in accordance with the approved rate of discharge (pumps with relevant fixed or alternating capacity, shut-off and control valves, etc.) are not available on board, discharge of untreated sewage into the sea within the areas where the discharge is permitted shall be prohibited in accordance with regulation 11.1.1 of Annex IV to MARPOL 73/78. In this case all sewage shall be stored in holding tanks and discharged to the reception facilities. The fact of discharge of untreated sewage within the areas where the discharge is permitted without the above measures taken shall be considered as a violation of the MARPOL 73/78 requirements.

## **4 INSTRUMENTATION**

**4.1** The holding tanks shall be provided with the visual and audible alarm operating in case of 80 per cent filling of the tank.

**4.2** The sewage treatment plant shall be fitted with devices for collection of samples of purified and disinfected waters.

## **5 APPLICATION OF THE REQUIREMENTS OF ANNEX IV TO MARPOL 73/78 FOR SHIPS NOT ENGAGED IN INTERNATIONAL VOYAGES**

**5.1** On ships not engaged in international voyages the Administration shall take adequate measures to meet the applicable provisions of Annex VI to MARPOL 73/78.

**5.2** For ships flying the flag of the Russian Federation equipped with at least a sewage holding tank of sufficient capacity and a sewage discharge pipeline with standard discharge connections according to 3.5.1, the Register may issue the Oil, Sewage and Garbage Pollution Prevention Certificate (Form 2.4.18) upon the results of relevant surveys (provided the requirements of Annexes I and V to MARPOL 73/78 are complied with, if applicable).

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

## **1 GENERAL**

### **1.1 SCOPE OF APPLICATION**

**1.1.1** The provisions of the present Part cover all the ships in accordance with the requirements of Annex V to MARPOL 73/78.

**1.1.2** The MODU, FOP and FPU equipment and arrangements for the prevention of pollution by garbage shall comply with the requirements of Section 4, Part V "Equipment for Prevention of Pollution" of the Rules for the Equipment of MODU and FOP.

### **1.2 DEFINITIONS AND EXPLANATIONS**

**1.2.1** In the present Part the following definitions and explanations have been adopted.

**I n c i n e r a t o r** means the ship's plant for burning of solid waste generated during operation of the ship.

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

**G a r b a g e p r o c e s s i n g d e v i c e** means a plant for comminution or reducing the volume and mass of garbage.

**G a r b a g e r e c e p t a c l e** means containers and other receptacles for the collection and storage of garbage.

**N u m b e r o f p e r s o n s o n b o a r d** means crew, passengers and special personnel, which the ship is certified to carry.

### **1.3 SCOPE OF TECHNICAL SUPERVISION**

**1.3.1** General provisions on the procedure of technical supervision during manufacture of the equipment and arrangements designed for garbage processing and their survey, as well as the requirements for the technical documentation submitted to the Register for review are specified in the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships and in Part I "Regulations for Technical Supervision".

Every ship is subject to surveys as specified in 2.1.3, Part I “Regulations for Technical Supervision”.

**1.3.2** Subject to the Register technical supervision during manufacture are incinerators of the approved type and garbage processing devices with the associated electrical equipment, control, regulation and monitoring devices.

**1.3.3** Subject to the Register technical supervision during the ship’s survey are incinerators of the approved type, garbage processing devices and garbage receptacles.

## **2 EQUIPMENT AND DEVICES FOR GARBAGE COLLECTION, STORAGE AND PROCESSING**

### **2.1 GENERAL**

**2.1.1** 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 type of ship, area of navigation, number of crew, etc.

**2.1.2** 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.

### **2.2 GARBAGE RECEPTACLES**

**2.2.1** Garbage receptacles may be removable or permanently fixed. In both cases garbage receptacles shall have smooth inner surfaces.

**2.2.2** The 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.

**2.2.3** The permanently fixed garbage receptacles shall be so designed as to allow easy discharge and cleaning.

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

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

**2.2.6** 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.

**2.2.7** The garbage receptacles shall be located in places convenient for permitted garbage disposal into the sea, discharge to reception facilities, 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.

## **2.3 GARBAGE COMMINUTERS AND COMPACTORS**

**2.3.1** The garbage comminutors shall provide for comminution of particles not exceeding 25 mm in size.

**2.3.2** Garbage compactors shall be installed in a compartment with adequate room for operating and maintaining the unit and storing trash to be processed. The space shall have freshwater washdown service, coamings, deck drains, adequate ventilation and fire-fighting equipment.

**2.3.3** The arrangements for disposal of garbage into the sea shall be provided with plates indicating the conditions of their use.

## **2.4 INCINERATORS**

**2.4.1** The incinerator installed on board the ship shall comply with the requirements of Resolution MEPC.59(33) or Resolution MEPC.76(40), whichever is applicable.

**2.4.2** In accordance with regulation 16 of Annex VI to MARPOL 73/78, the incinerators set forth below shall be manufactured in compliance with the requirements of Resolution MEPC.76(40) as regards the incinerators up to 1500 kW and shall have type approval of the Administration:

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 in accordance with the requirements in Resolutions MEPC.76(40) shall not be allowed.

**2.4.3** Incinerators installed in existing ships, the date of contract for delivery of which is before 1 January, 2000, may have type approval in accordance with the requirements of Resolution MEPC. 59(33) or other normative documents.

**2.4.4** During survey of incinerators on board, the following units and devices shall be tested:

**.1** flame safeguard of incinerating furnace in case of the burner flame failure with verification of audible alarm and visible indicator operation. The shut-down times shall be verified in accordance with the requirements of the above resolutions;

**.2** limit controls for operation;

**.3** fuel oil pressure limit control for operation in case of fuel oil pressure lowering below the value required for safe combustion;

**.4** other interlocks provided as specified by the incinerator manufacturer;

**.5** programming controls controlling and cycling the unit (prepurge, ignition, postpurge, etc.) as specified by the incinerator manufacturer;

**.6** fuel oil supply controls: operation of two fuel oil control solenoid valves for all conditions of the incinerator operation;

**.7** device shutting off fuel oil supply to burners in case of reduced voltage;

**.8** switches for proper operation;

**.9** availability of marking (name of manufacturer, type, serial number, power in thermal units per time unit, IMO Resolution for compliance with which the incinerator was approved), as well as warning plates;

**.10** oil residues (sludge) processing system (if available):

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

oil residues (sludge) preheating system;

homogenization system.

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

## **1 GENERAL**

### **1.1 SCOPE OF APPLICATION**

**1.1.1** The provisions of the present Part apply to all ships subject to the Register technical supervision, as well as to their equipment, arrangements and systems for the prevention of air pollution, except where expressly provided otherwise, in compliance with the requirements of Annex VI to MARPOL 73/78 and NO<sub>x</sub> Technical Code.

### **1.2 DEFINITIONS AND EXPLANATIONS**

**1.2.1** In the present Part the following definitions and explanations 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<sub>x</sub>) emission control** means a modification on or after 1 January 2000 of a marine diesel engine that has not already been surveyed to the standards set forth in regulations 13.1, 13.4 or 13.5.1.1 of Annex VI to MARPOL 73/78 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 NO<sub>x</sub> Technical Code 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 initial survey of the engine.

**Approved method** means a method for a particular engine, or a range of engines, which if applied to the engine, will ensure that the engine complies with the applicable NO<sub>x</sub> limit as detailed in regulation 13.7 of Annex VI to MARPOL 73/78. Approved methods may be the necessary engine settings or the installation of the set of equipment for the engine modernization.

**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 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 (CFC):

CFC-11 Trichlorofluoromethane;

CFG-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<sub>x</sub> emission control area** means an area where the adoption of special mandatory measures for SO<sub>x</sub> emissions from ships is required to prevent, reduce and control air pollution from SO<sub>x</sub> and its attendant adverse impacts on land and sea areas.

**Shipboard incineration** means the incineration of wastes and other matter on board a 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 tankers and their transfer to the device intended for their processing (i.e. utilization, for example, by means of burning).

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

**Installations (in relation to ozone depleting substances)** means the installation of systems, equipment including portable fire extinguishing units, insulation or other material on a ship, but excludes the repair or recharge of previously installed systems, equipment, insulation, or other material, or the recharge of portable fire extinguishing units.

**Fuel oil incinerators** mean any engines, auxiliary boilers, gas turbines or other installations consuming fuel oil except shipboard incinerators.

### **1.3 SURVEYS AND SCOPE OF TECHNICAL SUPERVISION**

**1.3.1** Every ship of 400 gross tonnage and above, as well as every MODU, FOP and FPU shall be subject to surveys in accordance with regulation 5 of Annex VI to MARPOL 73/78.

**1.3.2** Subject to the Register technical supervision are the following:

- .1 installations and systems in relation to application therein ozone depleting substances (fire-fighting systems, refrigerating equipment);
- .2 marine diesel engines of more than 130 kW power output in relation to NO<sub>x</sub> emission control in compliance with NO<sub>x</sub> Technical Code;
- .3 exhaust gas cleaning system to reduce NO<sub>x</sub> emission in compliance with NO<sub>x</sub> Technical Code;
- .4 exhaust gas cleaning system to reduce SO<sub>x</sub> emission in compliance with Resolution MEPC.184(59);
- .5 shipboard fuel system in relation to the possibility of conversion of the ship engines to fuel oil with low sulphur content within SO<sub>x</sub> emission control areas, and the possibility of fuel oil sampling on the ship suction fuel oil piping by means of sampling device of the design approved by the Register in compliance with Resolution MEPC.182(59);
- .6 cargo vapour discharge system in relation to availability of the system approved by the Register on board tankers subject to control in relation to volatile organic compounds vapour emission;
- .7 shipboard incinerators.

**1.1.3** During survey of ships and marine diesel engines the provisions of the Guidelines on the Application of Provision of the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines.

**1.1.4** In the case of ships of less than 400 gross tonnage, the Administration may establish appropriate measures in order to ensure that the applicable provisions of Annex VI to MARPOL 73/78 are complied with.

## **2 CONTROL OF EMISSIONS FROM SHIPS**

### **2.1 OZONE DEPLETING SUBSTANCES**

**2.1.1** Any deliberate emissions of ozone depleting substances occurring during recharging, maintenance and repair of installations on board shall be prohibited (except for ensuring ship security or safety of life at sea, or in case of ship damage). Deliberate emissions do not include minimal releases associated with recapture or recycling of ozone depleting substances.

**2.1.2** In accordance with regulation 12.3 of Annex VI to MARPOL 73/78 the following installations shall be prohibited:

- .1 installations which contain ozone depleting substances other than hydrochlorofluorocarbons (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 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 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 CFC and HCFC 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 subject to regulation 6.1 of Annex VI to MARPOL 73/78, namely each ship of 400 gross tonnage and above engaged in international voyages:

shall maintain a list of equipment containing ozone depleting substances. This list shall be entered in item 2.1 of the Supplement to the International Air Pollution Prevention Certificate (Form 2.4.23);

which has rechargeable systems that contain ozone depleting substances shall maintain the 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 Administration.

Entries in the Ozone Depleting Substances Record Book shall be recorded in terms of mass, in kg, of substance and shall be completed 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 land-based reception facilities; and
- .5 supply of ozone depleting substances to the ship.

## **2.2 NITROGEN OXIDES (NO<sub>x</sub>)**

**2.2.1** Regulation 13 of Annex VI to MARPOL 73/78 applies to:

each marine diesel engine with a power output of more than 130 kW permanently installed on a ship;

each marine diesel engine with a power output of more than 130 kW which undergoes a major conversion on or after 1 January 2000 except when demonstrated to the satisfaction of the Administration that such engine is an identical replacement to the engine which it is replacing and is otherwise not covered by regulation 13.1.1.1 of Annex VI to MARPOL 73/78.

Notwithstanding the above provisions, the Administration may provide an exclusion from the application of this regulation for any marine diesel engine which is installed on a ship constructed, or for any marine diesel engine which undergoes a major conversion, before 19 May 2005, provided that the ship on which the engine is installed is solely engaged in voyages to ports or offshore terminals within the State the flag of which the ship is entitled to fly.

**2.2.2** The date of major conversion may be determined:

by the contract for this conversion; or

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

**2.2.3** 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 standards in regulation 13 of Annex VI to MARPOL 73/78 in force at the time of 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 replacement engine to meet the standards set forth in regulation 13.5.1.1 of Annex VI to MARPOL 73/78 (Tier III), then that replacement engine shall meet the standards set forth in regulation 13.4 of Annex VI to MARPOL 73/78 (Tier II). IMO shall develop guidelines to set forth the criteria of when it is not possible for replacement engine to meet the standards in regulation 13.5.1.1 of Annex VI to MARPOL 73/78.

**2.2.4** If any substantial modification is made to any marine diesel engine (unless it is covered by regulation 13.1.2 of Annex VI to MARPOL 73/78); or the maximum continuous rating of the engine is increased by more than 10 per cent

as compared to the maximum continuous rating of the initial survey of the engine, then the  $\text{NO}_x$  emission (calculated as the total weighted emission of  $\text{NO}_2$ ) from this engine shall be within the following limits:

for a ship constructed prior to 1 January 2000, the standards set forth in regulation 13.3 of Annex VI to MARPOL 73/78 (Tier I) shall apply;

for a ship constructed on or after 1 January 2000, the standards set forth in regulation 13 of Annex VI to MARPOL 73/78 in force at the time the ship was constructed (Tiers I, II or III) shall apply.

**2.2.5**  $\text{NO}_x$  emission limitations do not apply to:

emergency marine diesel engines;

marine diesel engines installed in lifeboats and any device or equipment intended to be used solely for emergencies;

marine diesel engines installed on ships not engaged in international voyages, provided that such engines are subject to an alternative  $\text{NO}_x$  control measure established by the Administration;

marine diesel engines ensuring the operation of MODU, FOP and FPU process equipment.

**2.2.6** Subject to regulation 13 of Annex VI to MARPOL 73/78, the operation of a marine diesel engine is prohibited, except when the emission of  $\text{NO}_x$  (calculated as the total weighted emission of  $\text{NO}_2$ ) from the engine is within the limits specified in regulation 13 of Annex VI to MARPOL 73/78, for the following tiers of compliance of marine diesel engines with the requirements of this regulation:

**Tier I: marine diesel engine is installed on a ship constructed on or after 1 January 2000 and prior to 1 January 2011:**

17,0 g/kWh,	when $n$ is less than 130 rpm;
$45,0 \times n^{(-0,2)}$ g/kWh,	when $n$ is 130 or more but less than 2000 rpm;
9,8 g/kWh,	when $n$ is 2000 rpm or more

where  $n$  = rated engine speed.

**Tier II: marine 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

where  $n$  = rated engine speed.

**Tier III: marine diesel engine is installed on a ship constructed on or after 1 January 2016 and operating in NO<sub>x</sub> emission control areas designated under regulation 13.6 of Annex VI to MARPOL 73/78:**

3,4 g/kWh,                    when  $n$  is less than 130 rpm;  
9,0 ×  $n^{(-0.2)}$  g/kWh,      when  $n$  is 130 or more but less than 2000 rpm;  
2,0 g/kWh,                    when  $n$  is 2000 rpm or more

where  $n$  = rated engine speed.

Tier II standard may apply to a marine diesel engine installed on a ship constructed on or after 1 January 2016 and operating outside NO<sub>x</sub> emission control areas designated under regulation 13.6 of Annex VI to MARPOL 73/78.

**Existing marine diesel engine with a power output of more than 5000 kW and a per cylinder displacement at or above 90 l installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000.**

NO<sub>x</sub> emission limits from the above existing marine diesel engine shall remain within limits of Tier I standard. To this end the Administration of Party to Protocol 1997 (Annex VI to MARPOL 73/78) shall survey an approved method for that engine and submit notification of such survey to IMO.

Compliance with the above requirement may be demonstrated through one of the following:

installation of the approved method, as confirmed by a survey using the verification procedure specified in the Approved Method File, including appropriate notation on the Supplement to the International Air Pollution Prevention Certificate (Form 2.4.23); or

pre-certification survey of the engine confirming that it operates within the NO<sub>x</sub> emission limits set forth in regulation 13.7.4 of Annex VI to MARPOL 73/78 (i.e. within limits of Tier I standard), as a result of which the Technical File of Marine Diesel Engine has been approved, the Engine International Air Pollution Prevention Certificate (Form 2.4.40) has been issued, including appropriate notation on the Supplement to the International Air Pollution Prevention Certificate (Form 2.4.23).

Compliance with the above requirement shall be demonstrated no later than the first survey to renew the International Air Pollution Prevention Certificate (Form 2.4.6) that occurs 12 months or more after deposit to IMO of the Administration's notification about survey of the approved method. If a shipowner of a ship on which an approved method shall be installed can demonstrate to the satisfaction of the Administration that the approved method was not commercially available

despite best efforts to obtain it, then that approved method shall be installed on the ship no later than the next annual survey of that ship which falls after the approved method is commercially available.

Survey of an approved method shall be in accordance with chapter 7 of the revised NO<sub>x</sub> Technical Code and shall include verification:

by the designer of the base marine diesel engine to which the approved method applies that the calculated effect of the approved method will not decrease engine rating by more than 1 per cent, increase fuel consumption by more than 2 per cent as measured according to the appropriate test cycle set forth in revised NO<sub>x</sub> Technical Code, or adversely affect engine durability or reliability;

that the cost of the approved method as compared to the amount of NO<sub>x</sub> reduced by the approved method calculated in accordance with the formula in regulation 13.7.5.2 of Annex VI to MARPOL 73/78, is not excessive, i.e. it doesn't exceed 375 SDR (definitions for the above formula are given in MEPC.1/Circ.678).

**2.2.7** Marine diesel engines covered by regulation 13 of Annex VI to MARPOL 73/78 specified in 2.2.1, shall be subject to pre-certification survey at the manufacturer's in accordance with the revised NO<sub>x</sub> Technical Code and the provisions of the Guidelines on the Application of Provisions of the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines.

Upon the survey results the Engine International Air Pollution Prevention Certificate (Form 2.4.40) with Supplement (Form 2.4.41) shall be issued to parent engines and to each engine of the group or family by the Register on behalf of the Administration.

## **2.3 SULPHUR OXIDES (SO<sub>x</sub>)**

**2.3.1** In accordance with regulation 14.1 of Annex VI to MARPOL 73/78, the sulphur content of any fuel oil used on board ships shall not exceed the following limits, even though the International Air Pollution Prevention Certificate (Form 2.4.6) has not been issued to the ship yet:

4,5 % m/m prior to 1 January 2012;

3,5 % m/m on and after 1 January 2012;

0,5 % m/m on and after 1 January 2020.

**2.3.2** In accordance with regulation 14.4 of Annex VI to MARPOL 73/78 while ships are operating within SO<sub>x</sub> emission control area, the sulphur content of any fuel oil used on board ships shall not exceed the following limits, even though the International Air Pollution Prevention Certificate (Form 2.4.6) has not been issued to the ship yet:

- 1,5 % m/m prior to 1 July 2010;
- 1,0 % m/m on and after 1 July 2010;
- 0,1 % m/m on and after 1 January 2015.

**2.3.3** An exhaust gas cleaning system for shipboard fuel oil incinerators approved by the Administration, taking into account the provisions of Resolution MEPC.184(59) providing for equal compliance with the requirements of 2.3.1 and 2.3.2, may be used as an alternative compliance method to reduce SO<sub>x</sub> emission.

**2.3.4** In accordance with Resolution MEPC.184(59) during approval of the above incinerators the compliance with regulations 14.1 and 14.4 of Annex VI to MARPOL 73/78 shall be demonstrated on the basis of SO<sub>2</sub> (ppm)/CO<sub>2</sub> (% v/v) ratio given in Table 2.3.4.

Table 2.3.4

**Limits of fuel oil sulphur content specified in regulations 14.1 and 14.4 of Annex VI to MARPOL 73/78 and corresponding values of emissions**

Fuel oil sulphur content (% m/m)	Emission ratio SO <sub>2</sub> (ppm)/CO <sub>2</sub> (% 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. Emission ratio limits may be only applicable when using a distillate based fuel oil or residual fuel oil.	

**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 kept onboard for three years since fuel oil delivery and which shall be accompanied by a representative sample obtained at the receiving ship's inlet bunker manifold by one of the following methods:

- .1 manual valve-setting continuous-drip sampler;
- .2 time-proportional automatic sampler;
- .3 flow-proportional automatic sampler.

Bunker delivery notes shall permanently be kept onboard even though the International Air Pollution Prevention Certificate (Form 2.4.6) has not been issued to the ship yet.

**2.3.6** The representative fuel oil sample shall be retained under the ship's control until the fuel oil delivered is totally consumed, but in any case for a period of not less than twelve months from the time of bunkering. The fuel oil verification procedure for the purposes of Annex VI to MARPOL 73/78 is specified in Appendix VI of Annex VI to MARPOL 73/78. Requirements for the sampling and sample storage are set forth in Resolution MEPC.182(59) and MEPC/Circ.508.

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

.1 possibility of fuel oil sampling at the receiving ship's inlet bunker manifold by means of the sampler according to Resolution MEPC.182(59);

.2 possibility of ensuring safe transfer on to fuel oils with sulphur content as specified in 2.3.2 prior to entry into SO<sub>x</sub> emission control area. The fuel oil service system shall be fully flushed of all kinds of fuels exceeding permissible limits of sulphur content.

## **2.4 VOLATILE ORGANIC COMPOUNDS**

**2.4.1** All oil tankers which are subject to volatile organic compounds vapour emission control in accordance with regulation 15.5 of Annex VI to MARPOL 73/78 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.

**2.4.2** In accordance with regulation 15.6 of Annex VI to MARPOL 73/78 a tanker carrying crude oil shall have on board and implement a Volatile Organic Compounds Management Plan approved by the Administration. Such a plan shall be prepared in accordance with Resolution MEPC.185(59), as well as MEPC.1/Circ.680 and MEPC.1/Circ.719.

## **2.5 SHIPBOARD INCINERATION**

**2.5.1** Shipboard incineration shall be in accordance with regulation 16 of Annex VI to MARPOL 73/78.

**2.5.2** General provisions for use and surveys of incinerators are given in 2.4, Part V "Ship's Equipment and Arrangements for the Prevention of Pollution by Garbage".

**2.5.3** In accordance with MEPC.1/Circ.642 shipboard incineration of oil residues (sludge) shall be allowed 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;  
systems 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.

### **3 REQUIREMENTS OF THE NORMATIVE DOCUMENTS FOR MODU, FOP AND FPU**

**3.1** MODU, FOP and FPU shall comply with the requirements of regulation 19 of Annex VI to MARPOL 73/78.

**3.2** Emissions arising from process equipment of MODU, FOP and FPU used in exploration and extraction of seabed mineral resources are not subject to control in accordance with Annex VI to MARPOL 73/78.

**3.3** The regulation 18 of Annex VI to MARPOL 73/78 as regards fuel oil quality shall not apply to the use of hydrocarbons produced and subsequently used at the site as oil fuel, when approved by the Administration.

Российский морской регистр судоходства

**Руководство по применению положений  
Международной конвенции МАРПОЛ 73/78**

Russian Maritime Register of Shipping

**Guidelines on the Application of Provisions  
of the International Convention MARPOL 73/78**

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