

# GUIDELINES

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

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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 on 1 April 2019.

The Guidelines have been prepared on the basis of the regulations of MARPOL Annexes I, II, IV, V and VI as amended, taking into account recommendations, procedural requirements (PR) and unified interpretations (UI) of the International Association of Classification Societies (IACS) and relevant UI, resolutions and circulars of the International Maritime Organization (IMO), as well as amendments developed immediately before publication.

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

In case of discrepancies between the Russian and English versions, the Russian version shall prevail.

Any amendments introduced into the present Guidelines by circular letters are specified in the Revision History. Editorial amendments are not included in the Revision History.

## REVISION HISTORY

Amended paras/chapters/sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
Part VI, para 2.2.9	The requirements have been specified considering IMO resolution MEPC.301(72)	313-04-1242c of 24.06.2019	24.06.2019
Part VI, Table 2.6.6	The Table has been supplemented by the data on ro-ro cargo ships and ro-ro passenger ships considering IMO resolution MEPC.301(72)	313-04-1242c of 24.06.2019	24.06.2019
Part VI, para 2.6.20	The reference to IACS PR38 (Rev.2 Mar 2019) has been specified	313-04-1223c of 21.05.2019	01.07.2019

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

### **1 GENERAL**

#### **1.1 SCOPE OF APPLICATION**

**1.1.1** The provisions of these Guidelines on the Application of Provisions of the International Convention MARPOL 73/78<sup>1</sup>, as amended by IMO resolution MEPC.265(68), 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 (UI).

**1.1.2** The requirements of Annex I to MARPOL 73/78, as amended by IMO resolution MEPC.265(68) (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, as amended by IMO resolution MEPC.265(68).

**1.1.3** The requirements of Annex II to MARPOL 73/78, as amended by IMO resolution MEPC.265(68) (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, as amended by IMO resolution MEPC.265(68).

**1.1.4** The requirements of Annex IV to MARPOL 73/78, as amended by IMO resolution MEPC.265(68) (Part IV "Ship's Equipment and Arrangements for the Prevention of Pollution by Sewage") apply to the following ships engaged in international voyages as specified in regulation 2 of Annex IV to MARPOL 73/78, as amended by IMO resolution MEPC.265(68):

- .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, as amended by IMO resolution MEPC.265(68), 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, as amended by IMO resolution MEPC.265(68), i.e. after 27 September 2008.

The existing ships mentioned in 1.1.4.3 and 1.1.4.4 under the flag of the states, administrations of which have authorized the Register, shall be subjected to the initial surveys to be performed after 27 September 2008 to issue International Sewage Pollution Prevention Certificate (form 2.4.9) (if these Certificates have not been issued earlier).

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, as amended by IMO resolution MEPC.265(68).

**1.1.5** The requirements of Annex V to MARPOL 73/78, as amended by IMO resolution MEPC.265(68) (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, as amended by IMO resolution MEPC.265(68).

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<sup>1</sup> Hereinafter referred to as "the Guidelines".

**1.1.6** The requirements of Annex VI to MARPOL 73/78 adopted by IMO resolution MEPC.176(58) (Part VI "Ship's Equipment and Arrangements for the Prevention of Air Pollution") with amendments related to energy efficiency of ships adopted by IMO resolutions MEPC.203(62), MEPC.251(66) and MEPC.278(70), unless expressly provided otherwise in regulations 3, 5, 6, 13, 15, 16, 18, 19, 20, 21, 22 and 22A 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** For the purpose of these 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.

**K e e l l a y i n g d a t e f o r f i b e r - r e i n f o r c e d p l a s t i c ( F R P ) s h i p s** means the date that the first structural reinforcement of the complete thickness of the approved laminate schedule is laid either in or on the mould.

**D a t e o f d e l i v e r y** means the completion date (day, month and year) of the survey on which the Certificate is based (i.e. the date of initial survey before the ship is put into service and when Certificate is issued for the first time).

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

**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).

**S i m i l a r s t a g e o f c o n s t r u c t i o n** 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 1 % of the estimated mass of all structural material, whichever is less.

**D i s c h a r g e**, 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 seabed mineral resources; or

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

Ship means a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft, as well as MODU, FOP and FPU, and other floating or fixed platforms.

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 in compliance with IMO resolution A.1120(30).

**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 in compliance with IMO resolution A.1120(30).

**2.1.3** As to the prevention of pollution by sewage, every ship of 400 gross tonnage and above engaged on international voyages, as well as every ship of less than 400 gross tonnage engaged on international voyages 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 in compliance with IMO resolution A.1120(30).

**2.1.4** As to the prevention of pollution by garbage, every ship shall be subject to the surveys upon authorization from the Administration in accordance with 2.2.4, Part III "Survey of Ships in Compliance with International Conventions, Codes, Resolutions and Rules for the Equipment of Sea-Going Ships" of the Guidelines on Technical Supervision of Ships in Service.

**2.1.5** As to the prevention of air pollution in accordance with the requirements of Chapter 2, Annex VI to MARPOL 73/78, every ship of 400 gross tonnage and above, as well as every MODU, FOP and any other platform shall be subject to the surveys specified below in accordance with regulation 5.1, Annex VI to MARPOL 73/78 and IMO resolution A.1120(30), to ensure that the designs of the structure, equipment, systems, fittings, arrangements and materials fully comply with the applicable requirements and are in fit condition:

**.1** an initial survey before the ship is put into service or before the International Air Pollution Prevention Certificate (IAPP Certificate) (form 2.4.6) with the Supplement (form 2.4.23) is issued for the first time in compliance with regulation 6, Annex VI to MARPOL 73/78;

**.2** IAPP 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 are applicable;

**.3** an intermediate survey within three months before or after the second anniversary date or within three months before or after the third anniversary date of the above Certificate which shall take the place of one of the annual surveys specified in 2.1.5.4;

**.4** an annual survey within three months before or after each anniversary date of the above Certificate, including a general inspection of the designs of the structure, equipment, systems, fittings, arrangements and materials to ensure that they have been maintained in accordance with regulation 5.5, Annex VI to MARPOL 73/78 and that they remain satisfactory for the service for which the ship is intended;

**.5** occasional survey either general or partial, according to the circumstances, shall be made during a repair resulting from investigations or whenever any important repairs or renewals are made in accordance with regulations 5.5 and 5.6, Annex VI to MARPOL 73/78. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory and that the ship complies in all respects with the applicable requirements.

**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 (refer to 2.2.1, Part VI "Ship's Equipment and Arrangements for the Prevention of Air Pollution" of these Guidelines) shall be subject to the surveys specified below:

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

**.2** initial survey of every engine having Engine International Air Pollution Prevention Certificate (EIAPP 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 in accordance with IMO resolution A.1120(30). This survey may lead (as regards compliance with regulation 13 of Annex VI to MARPOL 73/78) to issuance of the IAPP Certificate (form 2.4.6) during the ship's initial survey for compliance with Annex VI to MARPOL 73/78;

**.3** IAPP renewal, intermediate and annual surveys in accordance with IMO resolution A.1120(30), 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.

Upon results of initial and periodical surveys of marine diesel engines under the requirements of regulation 13 in Annex VI to MARPOL 73/78, the relevant entries shall be made in para 2.2.1 of the Supplement (form 2.2.41) to the IAPP Certificate (form 2.4.6) in accordance with IMO resolution MEPC.1/Circ.849.

**2.1.7** As to the energy efficiency of ships in accordance with the requirements of Chapter 4, Annex VI to MARPOL 73/78, every ship of 400 gross tonnage and above covered by Chapter 4, Annex VI to MARPOL 73/78 shall be subject to the surveys specified below in compliance with IMO resolution MEPC.203(62), taking into consideration the 2014 Guidelines on Survey and Certification of the Energy Efficiency Design Index (EEDI), given in IMO resolution MERC.254(67), as amended by IMO resolution MEPC.261(68):

**.1** an initial survey before the ship is put into service or before the International Energy Efficiency Certificate (IEE Certificate) (form 2.4.3) is issued for the first time. The survey shall be such as to ensure that attained energy efficiency design index (attained EEDI) of the ship complies with Chapter 4, Annex VI to MARPOL 73/78 and that the Ship Energy Efficiency Management Plan (SEEMP) required by regulation 22 of Annex VI is available onboard;

**.2** a general or partial survey, according to the circumstances, after a major conversion of a new ship to which requirements for EEDI apply. The survey shall ensure that the attained EEDI of the ship is recalculated and meets the requirements of regulation 21, Annex VI to MARPOL 73/78 with the reduction factor *X* corresponding to Table 2.6.4 of Part VI "Ship's Equipment and Arrangements for the Prevention of Air Pollution" of these Guidelines applicable for the type and size of the converted ship in the time phase corresponding to the date of contract for construction or keel laying or delivery specified for the ship prior to conversion;

**.3** in cases where the major conversion of a new or existing ship is so extensive that the ship is regarded as a newly constructed ship, the necessity of an initial survey on attained EEDI shall be determined.

The survey shall ensure that the attained EEDI is calculated and meets the requirements of regulation 21, Annex VI to MARPOL 73/78 with the reduction factor *X* corresponding to Table 2.6.4 of Part VI "Ship's Equipment and Arrangements for the Prevention of Air Pollution" applicable for the type and size of the converted ship at the date of the contract of the conversion or, in absence of a contract, the commencement date of the conversion. The survey shall also verify that the SEEMP required by regulation 22, Annex VI to MARPOL 73/78 is on board;

**.4** for existing ships, the verification of the requirement to have the SEEMP on board according to regulation 22, Annex VI to MARPOL 73/78, shall take place at the first intermediate or IAPP renewal survey of the ship according to 2.1.5.2 and 2.1.5.3, whichever is the first, on or after 1 January 2013.

**2.1.8** No changes shall be made in the equipment, systems, arrangements and materials covered by the above surveys without the express approval of the Russian Maritime Register of Shipping<sup>1</sup>.

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<sup>1</sup>Hereinafter referred to as "the Register, RS".



## 2.2 SCOPE OF SURVEYS

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

Table 2.2.1

Symbols:

O — examination with provision of measures to enable the items involved to be made accessible for examination, to be opened up 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	Renewal
1	2	3	4	5	6
<b>1 Equipment and arrangements for the prevention of pollution by oil</b>					
1.1	Tank (segregated ballast, slop, cargo, oil fuel, oil residue (sludge) and oily bilge water holding tanks)	O			O
1.2	Crude oil washing system	OHP	P	P	OHP
1.3	15 ppm bilge separator	OP	P	P	OMP
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	OP	P	P	OP
1.11	Pumping and discharge arrangement for oil residues (sludge)	OP	P	P	OP
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			O
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	OP	P	P	OP
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			OMP
3.2	Sewage comminution and disinfection system	OP			OMP
3.3	Holding tanks	O			O
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 MARPOL 73/78	OMP	OM	OM	OMP
5.2	Arrangements for conversion of the engines to fuel oil with low sulfur content	OP	P	OP	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

## **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 (IOPP 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 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 upon shipowner's request;

**.5** IAPP 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** EIAPP 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;

**.7** IEE Certificate (form 2.4.3) with Supplement (form 2.4.3.1) shall be issued to any ship of 400 gross tonnage subject to the requirements of Chapter 4, Annex VI to MARPOL 73/78 and engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to MARPOL 73/78.

### **3 TECHNICAL DOCUMENTATION**

**3.1** At initial surveys of ships for compliance with the requirements of MARPOL 73/78, availability on board the ship of all the documentation required according to Section 17 of the Guidelines on Technical Supervision of Ships under Construction (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** user manual for a system of prompt access to computerised, shore-based emergency response services capable of carrying out damage stability and residual structural strength calculations; agreement with a shore-based emergency response service undertaking damage stability and residual structural strength calculations; Report (form 6.3.29) on the shore-based damage stability and residual structural strength calculation program with the approved test loading conditions used by the emergency response service, as well as information relating to a shore-based emergency response service recorded in SOPEP/SMPEP;

**.3** Ozone Depleting Substances Record Book, if applicable;

**.4** approved Exhaust Gas Cleaning (EGC) System — Technical Manual for Scheme A (ETM-A), if applicable, in accordance with IMO resolution MEPC.259(68);

**.5** approved EGC System — Technical Manual for Scheme B (ETM-B), if applicable, in accordance with IMO resolution MEPC.259(68);

**.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** Onboard Monitoring Manual (OMM), if applicable, in accordance with IMO resolution MEPC.259(68);

**.8** approved SO<sub>x</sub> Emissions Compliance Plan (SECP) (when EGCS-SO<sub>x</sub> is used) in accordance with IMO resolution MEPC.259(68);

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

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

**.12** 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;

**.13** Ship Energy Efficiency Management Plan (SEEMP) (if applicable, according to 2.6.8, Part VI "Ship's Equipment and Arrangements for the Prevention of Air Pollution");

**.14** EEDI Technical File (if applicable, according to regulations 20 and 21, Annex VI to MARPOL 73/78).

**3.2** At renewal, 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** Statement 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 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** For the purpose of this 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 % of the total length on a waterline at 85 % 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 IOPP Certificate (form 2.4.5).

**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 20000 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).

**Designated pump for oil residue (sludge) disposal** means any pump used for the disposal of oil residues (sludge) through the standard discharge connection referred to in regulation 13 of Annex I to MARPOL 73/78, or any pump used to transfer oil residues (sludge) to any other approved means of oil residue (sludge) disposal such as an incinerator, auxiliary boiler suitable for burning oil

residues (sludge) or other acceptable means which are prescribed in paragraph 3.2 of the Supplement (form 2.4.20 or 2.4.26) to the IOPP Certificate (form 2.4.5).

**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 20000 t deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and deadweight of 30000 t 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 20000 t deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and of 30000 t 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 5000 t 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 resulting 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 reined products (other than those petrochemicals which are subject to the provisions of Annex II to MARPOL 73/78) and, without limiting 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 conventional 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.

Oil residue (sludge) incineration systems mean the following:

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

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

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

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

Category A and B ships means the ships designed for operation in polar waters as determined in 2.1 and 2.2 of the Introduction of the International Code for Ships Operating in Polar Waters (Polar Code) given in IMO resolution MEPC.264(68).

Ship delivered on or before 31 December 1975 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.

Ship delivered before 1 January 2014 means a ship:

for which the building contract is placed before 1 January 2011; or

in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction before 1 January 2012; or

the delivery of which is before 1 January 2014.

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 residue (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.

**B r e a d t h ( *B* )** means the maximum breadth of the ship measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material. The breadth (*B*) is measured in metres.



## **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" of these Guidelines.

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

#### **3.1 SEGREGATED BALLAST TANKS**

**3.1.1** Every crude oil tanker of 20000 t deadweight and above and every product carrier of 30000 t 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 40000 t 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 73/78; 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 40000 t 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 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 — 8.4 of regulation 18 of Annex I to MARPOL 73/78.

**3.1.4** In every crude oil tanker of 20000 t deadweight and above and every product carrier of 30000 t 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.

Based on IACS Unified Interpretation (UI) MPC5, as amended, for the purpose of determining the minimum vertical depth of each double bottom tank or space to be taken into account when calculating the protecting area PAs, suction wells may be neglected, provided such wells are not excessive in area and extend below the cargo tank for a minimum distance and in no case more than half the height of the double bottom tank or space.

**3.1.5** In accordance with regulation 18.5 of Annex I to MARPOL 73/78, notwithstanding the provisions of regulation 18.2 concerning the capacity of the segregated ballast tanks, the segregated ballast conditions for oil tankers less than 150 m in length shall be to the satisfaction of the Administration. The Administrations may also follow the Guidance to Administrations Concerning Draughts Recommended for Segregated Ballast Tankers below 150 m in Length given in Appendix 1 of the Unified Interpretations of Annex I to MARPOL 73/78.

**3.1.6** Any oil tanker which is not required to be provided with segregated ballast tanks in accordance with 3.1.1 — 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.

Taking into consideration the unique operating requirements, the RS surveyor 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.

**3.1.7** Oil tankers delivered on or before 1 June 1982, 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 70000 t 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 70000 t 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 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;

**.2** 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 Administration may waive the requirements of regulation 29 of Annex I to MARPOL 73/78 for any oil tanker which engages on voyages both of 72 h or less in duration and within 50 miles 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.

**3.2.6** 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.

**3.2.7** 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** As regards limitations of size and arrangement of cargo tanks, as well as pipelines connecting cargo tanks and pipelines running through cargo tanks, every oil tanker of 150 gross tonnage and above, as listed below, shall comply with the provisions of regulation 26 of Annex I to MARPOL 73/78:

.1 ship delivered after 31 December 1979, but before 1 January 2010; and

.2 ship delivered on or before 31 December 1979, which falls into one of the following categories:  
a ship, the delivery of which is after 1 January 1977; or

a ship 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, every oil tanker of 150 gross tonnage and above delivered on or after 1 January 2010 shall comply with the provisions of regulation 23 of Annex I to MARPOL 73/78.

**3.3.2** In accordance with regulation 19.3.6 of Annex I to MARPOL 73/78, ballasting piping and other piping such as sounding and vent piping to ballast tanks shall not pass through cargo tanks. Cargo piping and similar piping to cargo tanks shall not pass through ballast tanks. Exemptions to this requirement may be granted for short lengths of piping, provided that they are completely welded or equivalent.

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

**3.4.1** Every crude oil tanker of 20000 t 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 the International Code for Fire Safety Systems (FSS Code) considering IMO resolution MSC.98(73), as amended.

**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 IMO resolution A.446(XI), as amended by IMO resolutions A.497(XII) and A.897(21).

### **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 t 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.

The aggregate capacity of ballast tanks on crude oil tankers of 20000 t deadweight and above and product carriers of 30000 t deadweight and above, shall be calculated in accordance with regulation 19.3.4 of Annex I to MARPOL 73/78 considering IACS UI MPC6, as amended, set out in the Supplement to Rules and Guidelines of Russian Maritime Register of Shipping "IACS Procedural Requirements, Unified Interpretations and Recommendations" (published in electronic form as a separate edition).

**3.5.1.2** Turn of the bilge area or at locations without a clearly defined turn of the bilge, when the distances  $h$  and  $w$ , as specified in regulation 19.3.3 of Annex I to MARPOL 73/78, are different, the distance  $w$  shall have preference at levels exceeding  $1,5h$  above the baseline.

In accordance with IACS UI MPC9, as amended, this requirement for turn of the bilge areas is applicable throughout the entire tank length.

**3.5.1.3** Oil tankers of 5000 t 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 — 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.

**3.5.1.4** 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 — 8 of regulation 19 of Annex I to MARPOL 73/78, on conditions specified in regulation 21 of Annex I.

**3.5.1.5** 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.

**3.5.1.6** Notwithstanding compliance with the requirements of 3.5.1.4 on ships operating in the Antarctic area, they are prohibited to carry in bulk as cargo or carry and use as fuel heavy grade oil listed in regulation 43 of Annex I to MARPOL 73/78.

**3.5.1.7** For category A and B oil tankers of less than 5000 t deadweight constructed on or after 1 January 2017, when operating in Polar waters as defined by the Polar Code given in IMO resolution MEPC.264(68), the entire cargo tank length shall be protected with:

double bottom tanks or spaces arranged in accordance with the requirements of regulation 19.6.1 of Annex I to MARPOL 73/78; and

wing tanks or spaces arranged in accordance with regulation 19.3.1 and complying, in relation to the distance, with the applicable requirements of regulation 19.6.2 of MARPOL Annex I.

**3.5.1.8** For category A and B ships other than oil tanks constructed on or after 1 January 2017, when operating in Polar waters as defined by the Polar Code given in IMO resolution MEPC.264(68), all cargo tanks constructed and utilized to carry oil shall be separated from the outer shell by a distance of not less than 0,76 m.

### **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.

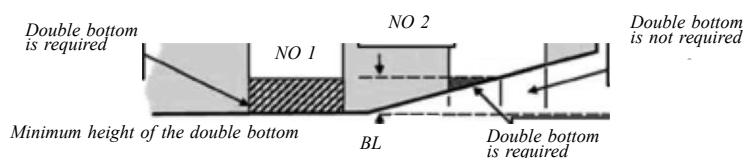


Fig. 3.5.2.2

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).

### **3.6 SUBDIVISION AND STABILITY**

**3.6.1** Every oil tanker of 5000 t deadweight and above delivered on or after 1 February 2002 (as defined in regulation 1.28.7 of Annex I to MARPOL 73/78) shall comply with the intact stability criteria specified in paragraphs 1.1 and 1.2 of regulation 27 of Annex I to MARPOL 73/78.

**3.6.2** Every oil tanker delivered after 31 December 1979 (as defined in regulation 1.28.2 of Annex I to MARPOL 73/78), of 150 gross tonnage and above, shall comply with the subdivision and damage stability criteria as specified in regulation 28.3 of Annex I to MARPOL 73/78.

**3.6.3** In accordance with regulation 28 of Annex I to MARPOL 73/78, as amended by IMO resolution MEPC.248(66), all oil tankers shall be fitted with a stability instrument, capable of verifying compliance with applicable intact and damage stability requirements.

**3.6.4** For oil tankers constructed on or after 1 January 2016, a survey of stability instrument shall be carried out at initial survey.

For oil tankers constructed before 1 January 2016, such survey shall be carried out at the first scheduled IOPP renewal survey of the ship after 1 January 2016 but not later than 1 January 2021.

## **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.

Suction wells may be neglected in the determination of the value  $h$  provided such wells are not excessive in area and extend below the tank for a minimum distance and in no case more than half the height of the double bottom. If the depth of such a well exceeds half the height of the double bottom  $h$ , shall be taken equal to the double bottom height minus the well height.

Piping serving such wells if installed within the double bottom shall be fitted with valves or other closing arrangements located at the point of connection to the tank served to prevent oil overflow in the event of damage to the piping. These valves or other closing arrangements located in accordance with the unified interpretation of regulation 25.3.3 of Annex I to MARPOL 73/78 (IMO document MEPC 56/23, Annex 15), may be treated in a manner similar to the treatment of suction wells as per regulation 12A.10 of Annex I to MARPOL 73/78 and, therefore, arranged at a distance from the bottom plating of not less than  $h/2$  (refer to Fig. 13.2.6). In addition to being not excessive in area, the size of the suction wells mentioned in regulation 25.3.3 of Annex I to MARPOL 73/78, shall be appropriate to the size of the suction pipe.

In accordance with regulation 23.11 of Annex I to MARPOL 73/78, the cargo pipelines of piping that run through cargo tanks in a position less than  $0,30B_S$  ( $B_S$  is the greatest moulded breadth of the ship) from the ship's side or less than  $0,30D_S$  ( $D_S$  is the moulded depth) from the bottom plating shall be fitted with valves or similar closing devices at the point at which they open into any cargo tank.

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 IMO resolution MEPC.122(52), as amended by IMO 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 (IMO document 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, except in the case when the Administration may waive this requirement in compliance with regulation 14.5 of Annex I to MARPOL 73/78, as amended by IMO resolution MEPC.265(68).

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

Ships, such as hotel ships, storage vessels, etc., which are stationary except for non-cargo-carrying relocation voyages need not be provided with 15 ppm bilge separators, provided they are fitted with a holding tank having a volume adequate for the total retention on board of the oily bilge water.

**5.1.2** 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 filtering ability 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 IMO resolution MEPC.107(49) (considering the provisions of IMO circular 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 IMO circular 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 electrical and electronic sections of the 15 ppm bilge separators shall function satisfactorily on completion of environmental testing in accordance with Part 3 of the Annex to IMO resolution MEPC.107(49).

**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  $p_{open} = 1,1p$ , 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 rated capacity of the 15 ppm bilge separator. In any case the capacity of the 15 ppm bilge separator pump shall not exceed more than 1,1 times the rated capacity 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.

**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 h 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** Where there is a possibility of oil residue (sludge) leakage, the 15 ppm bilge separators, pumps and other equipment shall be fitted with arrangements for collecting leakages.

**5.2.12** 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. 5.2.12.

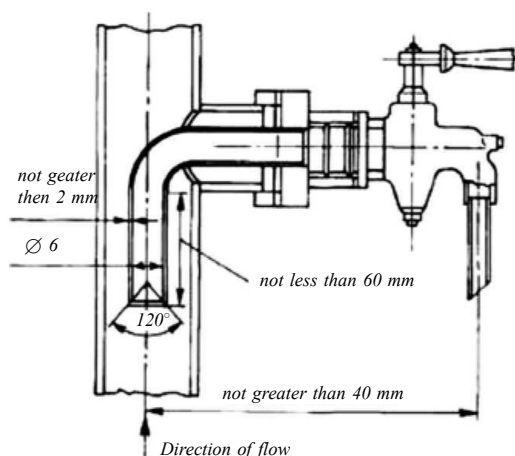


Fig. 5.2.12  
Sampling arrangement for pressure piping

**5.2.13** 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.

**5.2.14** Any electrical equipment which is part of the 15 ppm bilge separator shall be based in a non-hazardous area, or shall be certified by the Administration as safe for use in a hazardous area. Any moving parts which are fitted in hazardous areas shall be arranged so as to avoid the formation of static electricity.

**5.2.15** 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.

**5.2.16** 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 5.2.15 and the re-circulation pipeline after automatic stopping device. Re-circulating facilities for oily bilge water shall exclude any by-pass of the 15 ppm bilge separator.

**5.2.17** 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.

**5.2.18** Recommended rated capacity of the 15 ppm bilge separators depending on the ship's gross tonnage is given in Table 5.2.18.

Table 5.2.18

Ship's gross tonnage	Recommended rated capacity of the 15 ppm bilge separators, in 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

**5.2.19** At voluntary upgrading of existing 15 ppm bilge separator having the Certificate of Type Approval issued by Administration according to IMO resolution MEPC.60(33), to improvement its capabilities for compliance with IMO resolution MEPC.107(49) by installation of add-on equipment, this add-on equipment shall be tested and surveyed according to IMO resolution MEPC.205(62) "2011 Guidelines and Specifications for Add-on Equipment for Upgrading Resolution MEPC.60(33) — Compliant Oil Filtering Equipment".

Upon satisfactory results of tests and survey of the add-on equipment, the Certificate of Type Approval for Add-on Equipment (form 2.4.17.2) is issued.

## **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 10000 gross tonnage and above;  
on any ship of 400 gross tonnage and above, but less than 10000 gross tonnage, which carries water ballast in oil fuel tanks, if the 15 ppm bilge separator needs to be used to discharge into the sea such ballast;

on any ship of 400 gross tonnage and above, but less than 10000 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 in accordance with 6.1.1 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 IMO resolution MEPC.107(49), as amended by IMO resolution MEPC.285(70) (considering the provisions of IMO circular 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 IMO circular 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** Any electrical equipment which is part of the 15 ppm bilge alarm shall be placed in a non-hazardous area, or shall be certified by the Administration as safe for use in a hazardous atmosphere. Any moving parts which are fitted in hazardous areas shall be arranged so as to avoid the formation of static electricity.

**6.2.4** The electrical and electronic sections of the 15 ppm bilge separators shall function satisfactorily on completion of environmental testing in accordance with Part 3 of Annex to IMO resolution MEPC.107(49).

**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 eighteen 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 eighteen 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 15 ppm bilge alarms shall be within  $\pm 5$  ppm, and it shall be checked by calibration and testing of the equipment conducted by a manufacturer or persons authorized by the manufacturer and shall be done at intervals not exceeding five years or within the term specified in the manufacturer's instructions, whichever is shorter. The calibration certificate for the 15 ppm bilge alarm, certifying date of last calibration check, shall be retained onboard and its validity shall be checked at IOPP annual/intermediate/renewal surveys carried out in accordance with 2.1.1, Part I "General".

**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 (ODMCS), except for cases specified in regulation 3 of Annex I to MARPOL 73/78 considering IMO resolution MEPC.265(68). 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 ODMCS is not required.

The ODMCS is a system which monitors the discharge into the sea of oily ballast water or other oily water from the cargo tank areas.

**8.1.2** The requirements to discharge when using the ODMCS are defined in regulation 34 of Annex I to MARPOL 73/78, as amended by IMO resolution MEPC.265(68).

**8.1.3** The requirements of regulation 31 of Annex I to MARPOL 73/78 shall apply to ships other than oil tankers fitted with cargo spaces which are constructed or utilized to carry oil in bulk of an aggregate capacity of 1000 m<sup>3</sup> and more.

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

**8.2.1** The technical requirements in accordance with the provisions of IMO resolution MEPC.108(49), as amended by IMO resolution MEPC.240(65), shall apply to the ODMCS.

**8.2.2** The above IMO resolution MEPC.108(49), as amended, 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 ODMCS 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 ODMCS shall function effectively under all environment conditions which oil tankers are normally assumed to encounter. The ODMCS shall be designed and constructed to meet the requirements for reliable performance in climatic conditions and under mechanical effects specified in Part 2 of the Annex to IMO resolution MEPC.108(49), as amended.

**8.2.5** The ODMCS shall comprise the equipment specified in 6.1.4 of IMO resolution MEPC.108(49), as amended, including an oil content meter. The meter shall be approved in accordance with the provisions of this resolution, and the Certificate of Type Approval specifying the range of cargoes carried shall be issued.

Oil content meters, which have been tested and submitted for type approval on or after 17 May 2013, shall have the Certificates of Type Approval issued in the form given in IMO resolution MEPC.240(65) regardless of whether such oil content meter is intended for monitoring of bio-fuel blends or not.

**8.2.6** Any failure of the ODMCS shall stop the discharge. In the event of failure of ODMCS the manually operated alternative method may be used.

**8.2.7** The ODMCS shall have an operational manual approved by the Administration in compliance with IMO resolution MEPC.108(49), as amended, and containing the information considering IACS UI MPC2, as amended.

### **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  $\pm 10$  %, 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  $\pm 10\%$ , 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 oil content meter and any electrical equipment which is part of the meter shall be placed in a non-hazardous area, or shall be certified by the Administration as safe for use in a hazardous atmosphere. 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 Annex I. 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 IMO 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 Certificate of Type Test for Oil/Water Interface Detectors for Use in Slop Tanks and Other Tanks (form 2.4.19).

**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  $-30\text{ }^{\circ}\text{C}$  to  $+50\text{ }^{\circ}\text{C}$ .

**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  $\pm 25\text{ mm}$  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.

**9.16** The requirements of regulation 32 of Annex I to MARPOL 73/78 shall also apply to ships other than oil tankers fitted with cargo spaces which are constructed or utilized to carry oil in bulk of an aggregate capacity of  $1000\text{ m}^3$  and more.



## **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 the Administration.

### **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 200 m<sup>3</sup> 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.

The pipeline may be led to one side of the ship subject to the possibility of providing discharge to both sides 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** No part of the machinery spaces oily bilge water system shall form part of any direct operational bilge water discharge system, such as cargo hold bilge discharge or anchor chain locker discharge.

**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.

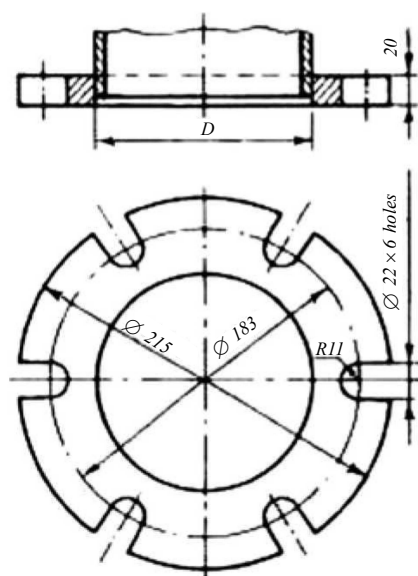


Fig. 10.2.2.1

**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 IMO circular 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 $P$ , in kW	Capacity of tank, in $m^3$
Up to 1000	4,0
1000 to 20000	$P/250$
Above 20000	$40 + P/500$

**11.1.2** If a ship is exclusively engaged on voyages within special areas as defined in Annex I to MARPOL 73/78, the Administration may waive the requirements for the ship fitting with oil filtering equipment provided the conditions specified in regulation 14.5 of Annex I to MARPOL 73/78 are complied with including the ship fitting with an oily bilge water holding tank having a volume adequate, to the satisfaction of the Administration, for the total retention on board of the oily bilge water. The tank adequate volume shall be confirmed by the appropriate calculation with regard to the intended area of navigation and service conditions of the ship.

**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 review. 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 main electrical power source of the FOP or non-self-propelled ships or floating facilities.

### 11.2 OIL RESIDUE (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  $m^3$ , shall be calculated by the formulae:

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

$$V_1 = K_1 CD \quad (11.2.1.1)$$

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 residue (sludge) incinerators, or other arrangements for oil residue (sludge) discharge approved by the Register

$V_1 = 50$  % 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  $V_1$  = refer to 11.2.1.1 or 11.2.1.2

$K_2$  = factor equal to:

0,01 for heavy fuel oil bunker tanks;

0,005 for diesel oil bunker tanks;

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

**11.2.2** The pipeline system of oil residue (sludge) tank or tanks shall be provided with a designated pump for oil residue (sludge) disposal through the standard discharge connection referred to in regulation 13 of Annex I to MARPOL 73/78. Where oil residue (sludge) service tank referred to in 11.2.3 directly supplies oil residues (sludge) to any other approved means of oil residues (sludge) disposal such as an incinerator, auxiliary boiler suitable for burning oil residues (sludge) or other acceptable means which are prescribed in paragraph 3.2 of the Supplement (form 2.4.20 or 2.4.26) to IOPP Certificate (form 2.4.5), the above pump used for the disposal of oil residue (sludge) from this service tank through the standard discharge connection may not be provided.

The designated pump for oil residue (sludge) disposal through the standard discharge connection may also be used to transfer oil residues (sludge) to any other approved means of oil residue (sludge) disposal, and to discharge oily bilge water to reception facilities through the standard discharge connection.

The above pump shall comply with 11.2.11 and 10.2.2.4.

**11.2.3** Tanks holding oil residues (sludge) prior to incineration in the approved means referred to in 11.2.2 (oil residue (sludge) service tanks) shall be provided. The above tanks shall be provided in addition to oil residue (sludge) tanks and shall be listed under paragraph 3.1 of the Supplement (form 2.4.20 or 2.4.26) to IOPP Certificate (form 2.4.5).

Oil residue (sludge) service tanks shall be equipped with suitable drainage facilities and fuel oil supply connections with a view to improving combustibility and calorific value (refer to MEPC.1/Circ.642).

**11.2.4** In compliance with amendments to regulation 12 of Annex I to MARPOL 73/78 given in IMO resolution MEPC.266(68), there shall be no interconnections between the sludge tank discharge piping mentioned in 11.2.2 and bilge-water piping other than possible common piping leading to the standard discharge connection referred to in 10.2.2.1. Also the piping shall have no connections to oily bilge water holding tanks, bilges of machinery spaces or 15 ppm separators. The common piping shall not be used to transfer oil residues (sludge) between ship's oil residue (sludge) tanks.

However, the oily residue (sludge) tanks may be fitted with drains, with manually operated self-closing valves and arrangements for subsequent visual monitoring of the settled water, that lead to an oily bilge water holding tank or bilge well, or an alternative arrangement, provided such arrangement does not connect directly to the bilge piping system.

**11.2.5** In compliance with IACS UI MPC99, the oil residue (sludge) tank discharge piping and bilge water piping shall be equipped with non-return valves to prevent oil residues (sludge) from discharging to the bilge water piping, bilge water tank, bilges of machinery spaces and bilge water separator. The piping specified in 11.2.4 may serve only one purpose: to connect the oil residue (sludge) tank discharge piping and oily bilge water discharge piping to the standard discharge connection referred to in 10.2.2.1, or any other approved means of disposal.

Acceptable piping arrangements are given in IACS recommendation No. 121 "Uniform Application of MARPOL Annex I, Revised Regulation 12".

**11.2.6** Ships constructed before 1 January 2017 shall be arranged to comply with the requirements of 11.2.4 and 11.2.5 not later than the first renewal survey carried out on or after 1 January 2017.

**11.2.7** Piping to and from oil residue (sludge) tanks shall have no direct connection overboard, other than the common pipeline to standard discharge connections in accordance with 10.2.2.1. Ships having piping to and from oil residue (sludge) tanks to overboard discharge outlets, other than the standard discharge connections referred to in 10.2.2.1, installed prior to 4 April 1993 may comply with regulation 12.3 of Annex I to MARPOL 73/78 by the installation of blanks in this piping.

**11.2.8** Oil residue (sludge) tanks shall be designed and constructed so as to facilitate their cleaning and the discharge of residues to reception facilities. In compliance with amendments to IMO resolution MEPC.266(68) this requirement need only be applied as far as is reasonable and practicable to ships delivered on or before 31 December 1979, as defined in regulation 1.28.1 of Annex I to MARPOL 73/78.

**11.2.9** In accordance with IMO circular 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.

**11.2.10** 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 is 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 11.2.4 (into oily bilge water tank or bilge wells).

**11.2.11** 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.

**11.2.12** The suction pipeline of the designated pump for oil residue (sludge) disposal shall be as short as possible. The oil residue (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 residue (sludge) path to the suction opening is as short as possible.

**11.2.13** The designated pump for oil residue (sludge) disposal 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 — 8 h. The pressure spool piece of the pump shall only be connected to the standard discharge connections and to oil residue (sludge) tanks and to oil residue (sludge) incinerators specified in paragraph 3.2 of the Supplement (form 2.4.20 or 2.4.26) to IOPP 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 IMO circular 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 11.3.3 and 11.3.6;
- .4 visual and audible alarm operating in case of 80 % filling of the tank.

**11.3.3** 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.

**11.3.4** Access holes of the oil residue (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.

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

**11.3.6** 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.

**11.3.7** For category A and B ships constructed on or after 1 January 2017, when operating in Polar waters as defined by the Polar Code given in IMO resolution MEPC.264(68), all oil residue (sludge) tanks and oily bilge water holding tanks shall be separated from the outer shell by a distance of not less than 0,76 m. This provision does not apply to small oil fuel tanks with a maximum individual capacity not greater than 30 m<sup>3</sup>.

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

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

**12.2** Oil residue (sludge) incineration systems may consist of the following:

steam boiler or heater of thermal liquid systems, or incinerator;

oil residue (sludge) processing system.

**12.3** Oil residue (sludge) processing system shall consist of the following:

oil residue (sludge) service tank;

oil residue (sludge) preheating systems;

filter;

homogenization systems.

**12.4** The oil residue (sludge) service tank shall be equipped with suitable drainage facilities and an oil fuel supply connection shall be provided.

**12.5** The homogenization system shall assure that the entire contents of the service 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>.

Sk e g 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.

Having regard to the type of the ship, and in case of impossibility to provide structural protection, alternatively to the requirements prescribed above, ships shall comply with the accidental oil fuel outflow performance standard according to regulation 12A.11 of MARPOL Annex I.

**13.2.2** The provisions of regulation 12A of Annex I to MARPOL 73/78 shall apply to self-elevating drilling units and 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 of Annex I to MARPOL 73/78.

**13.2.3** The provisions of regulation 12A of Annex I to MARPOL 73/78 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>. In case when the aggregate oil fuel capacity is less than 600 m<sup>3</sup>, the provisions of regulation 12A shall not apply to all oil fuel tanks.

**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).



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).

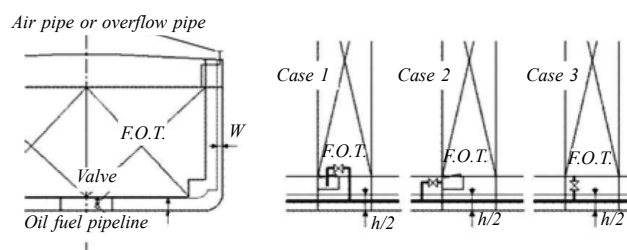


Fig. 13.2.6:

$h$  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

**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.

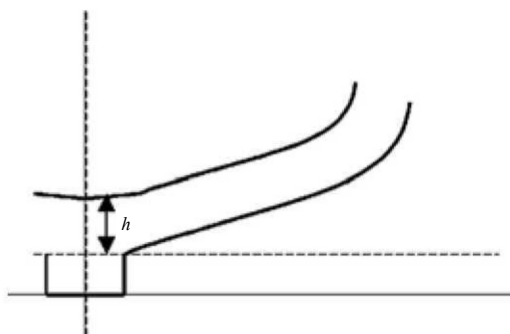


Fig. 13.2.8

**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.

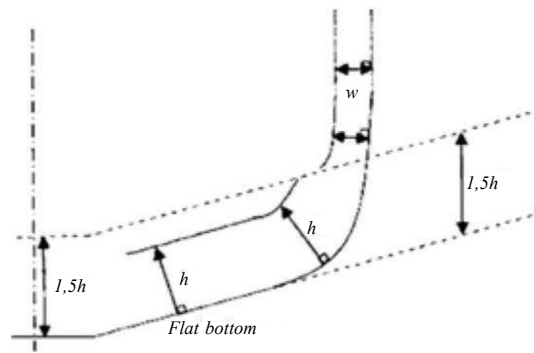


Fig. 13.2.10

**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.

**13.2.12** For category A and B ships constructed on or after 1 January 2017 with an aggregate oil fuel capacity of less than 600 m<sup>3</sup>, when operating in Polar waters as defined by the Polar Code given in IMO resolution MEPC.264(68), all oil fuel tanks shall be separated from the outer shell by a distance of not less than 0,76 m. This provision does not apply to small oil fuel tanks with a maximum individual capacity not greater than 30 m<sup>3</sup>.

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

**14.1** MODU, FOP and FPU, and other floating facilities or fixed platforms 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 those specified in regulation 39.2 of Annex I.

**14.2** In survey of FPU for compliance with MARPOL Annex I, in addition to the requirements of regulation 39.2 of Annex I, the provisions of the 2018 Guidelines for the Application of MARPOL Annex I Requirements to Floating Production, Storage and Offloading Facilities (FPSOs) and Floating Storage Units (FSUs) given in IMO resolution MEPC.311(73), 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 Annex I, 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 under the flag of the state, Administration of which has authorized the Register, the standard oil pollution prevention certificate (as per form 2.4.5) with a supplement (as per form 2.4.20) may be issued according to 1.11.3, Part III "Survey of Ships in Compliance with International Conventions, Codes, Resolutions and Rules for the Equipment of Sea-Going Ships" of the Guidelines on Technical Supervision of Ships in Service upon results of the appropriate survey, provided, at least, oil residue (sludge) tank discharge piping and bilge water piping with the standard discharge connections are available on board as specified in 10.2.2.1.

**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 state, which Administration has authorized the Register, the standard oil pollution prevention certificate (as per form 2.4.5) with a supplement (as per form 2.4.26) may be issued according to 1.11.3, Part III "Survey of Ships in Compliance with International Conventions, Codes, Resolutions and Rules for the Equipment of Sea-Going Ships" of the Guidelines on Technical Supervision of Ships in Service upon results of the appropriate survey, provided, on both sides of the open deck the discharge manifolds for connection to reception facilities for discharge of oily ballast water or oily bilge water are available on board.

## **16 APPLICATION OF THE REQUIREMENTS OF ANNEX I TO MARPOL 73/78 FOR PREVENTION OF POLLUTION DURING TRANSFER OF OIL CARGO BETWEEN OIL TANKERS AT SEA**

**16.1** Requirements of Chapter 8, Annex I to MARPOL 73/78 (IMO resolution MEPC.186(59)) apply to oil tankers of 150 gross tonnage and above engaged in the transfer of oil cargo between oil tankers at sea (STS operations) on or after 1 April 2012.

**16.2** In compliance with regulation 41, Chapter 8, Annex I to MARPOL 73/78, any oil tanker involved in STS operations shall carry on board a plan prescribing how to conduct STS operations (STS Operations Plan).

Guidelines for the development of STS Operations Plan is given in IMO document MEPC 61/8/1 (Chapter 6).

STS Operations Plan shall be approved by the Administration and be available onboard not later than the date of the first IOPP annual, intermediate or renewal survey of the ship to be carried out on or after 1 January 2011.

**16.3** The above mentioned requirements shall not apply to fixed platforms or floating facilities, including drilling units, as well as FPU (FPSO and FSO) engaged in STS operations.

**16.4** The above mentioned requirements shall not apply to bunkering operations.

## **17 SPECIAL REQUIREMENTS FOR THE USE OR CARRIAGE OF OILS IN THE ANTARCTIC AREA**

**17.1** In compliance with regulation 43 of Annex I to MARPOL 73/78, from 1 August 2011 the carriage in bulk as cargo and use as fuel (IMO resolution MEPC.189(60)), or from 1 March 2016 use as ballast (IMO resolution MEPC.256(67)) of the following oils shall be prohibited in the Antarctic area:

- crude oils having a density at 15 °C higher than 900 kg/m<sup>3</sup>;
- oils, other than crude oils, having a density at 15 °C higher than 900 kg/m<sup>3</sup> or a kinematic viscosity at 50 °C higher than 180 mm<sup>2</sup>/s; or
- bitumen, tar and their emulsions.

## **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** For the purpose of this 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 IBC Code 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 a 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 to 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.

**Category 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.

**Category 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.

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

**NLS tanker** 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.

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

**Residue** means any noxious liquid substance, which remains for disposal.

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

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

**Chemical tanker** 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" of these Guidelines.

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

**3.1** All ships carrying noxious liquid substances in bulk shall comply with the requirements of Annex II to MARPOL 73/78, as amended by IMO resolution MEPC.265(68).

The design, construction, equipment and operation of ships certified to carry noxious liquid substances in bulk identified in Chapter 17 of the IBC Code, shall be in compliance with the provisions of this Code and the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), depending on the date of the building contract and the date of ship construction as specified in regulation 11 of Annex II to MARPOL 73/78.

**3.2** The requirements for construction and equipment of ships carrying noxious liquid substances in bulk other than chemical tankers are given in Section 7.

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

### 4.1 TANK WASHING ARRANGEMENTS

**4.1.1** Tank washing arrangements are subject to special consideration by the Register.

**4.1.2** A prewash procedure is required in order to meet certain requirements of Annex II to MARPOL 73/78. Appendix VI of Annex II to MARPOL 73/78 explains how these prewash procedures shall be performed.

### 4.2 PUMPING AND PIPING ARRANGEMENTS OF STRIPPING SYSTEM

**4.2.1** Annex II to MARPOL 73/78 requires that every ship under this Annex shall be provided with a pumping and piping arrangement to ensure that each tank certified for the carriage of substances in category X, Y or Z does not retain a quantity of residue in excess of this Annex values in the tank and its associated piping. Only in this case the tank may be certified for the carriage of substances in the above categories.

**4.2.2** Assessment (determination) of residue quantities (stripping quantity) in cargo tanks, pumps and associated piping by conducting a water performance test shall be carried out in accordance with the procedure set out in Appendix 5 of Annex II to MARPOL 73/78.

### 4.3 SYSTEMS FOR CARGO RESIDUES DISCHARGE AND REMOVAL

**4.3.1** To meet standards for discharge of tank washings containing residues of substances in category X, Y or Z, the ships certified to carry such substances shall have an underwater discharge outlet taking into account the requirements in regulations 12.7 and 12.8 of Annex II to MARPOL 73/78.

**4.3.2** For ships constructed before 1 January 2007 and certified to carry substances in category Z an underwater discharge outlet is not mandatory.

**4.3.3** 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.

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

**4.3.5** 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

$$D = Q_d / 5L_d \quad (4.3.5)$$

where  $D$  = minimum diameter of the discharge outlet, in m;

$L_d$  = distance from the forward perpendicular to the discharge outlet, in m.

$Q_d$  = 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.

**4.3.6** Ventilation procedures approved by the Administration may be used to remove cargo residues from a tank. Such procedures shall be in accordance with Appendix 7 of Annex II to MARPOL 73/78.

**4.3.7** Ventilation equipment producing an airjet which can reach the tank bottom shall be used to remove cargo residues from a tank. Fig.4.3.7 could be used to evaluate the adequacy of ventilation equipment used for ventilating a tank of a given depth. Ventilation equipment shall be placed in the tank opening closest to the tank sump or suction point.

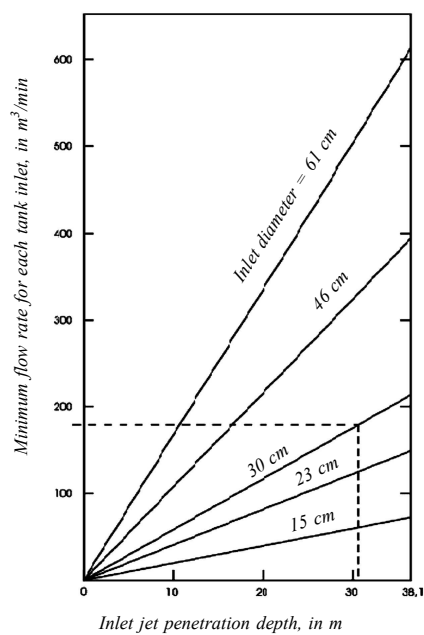


Fig. 4.3.7  
Minimum flow rate as a function of jet penetration depth

#### 4.4 SLOP TANKS

**4.4.1** 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 STABILITY INSTRUMENT**

**5.1** Every chemical tanker shall be fitted with a stability instrument, capable of verifying compliance with the applicable intact and damage stability requirements.

**5.2** For chemical tankers constructed on or after 1 January 2016, a survey of stability instrument shall be carried out at initial survey.

For chemical tankers constructed before 1 January 2016 such a survey shall be carried out at the first scheduled survey of the ship for renewal of the International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk or the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk, after 1 January 2016 but not later than 1 January 2021.

## **6 CARRIAGE OF VEGETABLE OILS**

**6.1** 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 shall plating nowhere less than 760 mm; and

**.2** double bottom tanks or spaces shall be arranged such that the distance between the bottom of the cargo tanks and the moulded line of the bottom shall plating measured at right angles to the bottom shell plating is not less than 5/15 m or 2 m at the centreline, whichever is the lesser. The minimum distance shall be 1 m.

**6.2** In accordance with IMO 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.

**6.2.1** 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 the Administration.

**6.2.2** 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 Procedures and Arrangements Manual.

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

**7.1** 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 IMO resolution A.673(16), as amended in accordance with IMO resolution MSC.236(82), and IMO resolution MEPC.148(54).

**7.2** 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.

**7.3** 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.

**7.4** The provisions of 6.3 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 6.3 shall be complied with and approved in the ship's design and technical documentation.

**7.5** The provisions of this 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.

**7.6** 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, in compliance with the requirements of Annex II to MARPOL 73/78, the Procedures and Arrangements Manual approved by the Administration or by the Register on its behalf.

**7.7** 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 cargo residues, washings and waste water after fish oil separator, containing cod-liver oil, except the cases specified in regulation 3, Annex II to MARPOL 73/78;

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

- the ship carries, in compliance with the requirements of Annex II to MARPOL 73/78, 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 specified above and the ship survey for compliance with the provisions of the Manual, the Report (form 6.3.10) shall be issued.



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

### **1 DEFINITIONS AND EXPLANATIONS**

**1.1** For the purpose of this Part the following definitions and explanations have been adopted.

**International voyage** means a voyage from a country, to which MARPOL 73/78 applies, to a port outside this country or conversely.

**New ship** 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.

**New passenger ship** means a passenger 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 in similar stage of construction, on or after 1 June 2019; or

the delivery of which is on or after 1 June 2021.

**Passenger ship** means a ship, which may carry more than twelve passengers.

**Holding tank** means a tank for the collection and storage of untreated sewage, activated sludge and pulp from the sewage treatment plant.

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

**Sewage** means:

drainage and other wastes from any form of 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.

**Existing ship** means a ship, which is not a new ship.

**Existing passenger ship** means a ship, which is not a new passenger ship.

**Sewage treatment plant** means a plant, in which sewage is treated and disinfected.

**Sanitary and domestic waste waters (grey water)** 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" of these Guidelines.

**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 — 8 of Annex IV to MARPOL 73/78.

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

#### 3.1 GENERAL

**3.1.1** The provisions of this Part apply to ships covered by the requirements of Annex IV to MARPOL 73/78, as amended by IMO resolution MEPC.265(68).

**3.1.2** In ships listed in 1.1.4, Part I "Regulations for Technical Supervision" of these Guidelines, 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.

**3.1.3** In the Baltic Sea special area as defined under amendments to MARPOL Annex IV adopted by IMO resolution MEPC.200(62), in accordance with regulation 11.3 of Annex IV to MARPOL 73/78, as amended by IMO resolution IMO MEPC.274(69), and considering the dates established by IMO resolution MEPC.275(69) on which this revised regulation shall take effect, the discharge of sewage from passenger ships within this special area shall be prohibited:

.1 for new passenger ships on or after 1 June 2019;

.2 for existing passenger ships other than those specified in 3.1.3.3, on or after 1 June 2021;

.3 for existing passenger ships en route directly to or from a port located outside the Baltic Sea special area and to or from a port located east of longitude 28° 10' E within the special area that do not make any other port calls within the special area, on 1 June 2023, unless the ships have in operation sewage treatment plants for which Type Approval Certificates have been issued by the Administration or recognized organization on its behalf, and which intend to discharge sewage effluent in the above mentioned special areas in accordance with IMO resolution MEPC.227(64), as amended by IMO resolution MEPC.284(70).

The dates of taking effect of other special areas not yet designated will be established by IMO in accordance with regulation 13.2 of Annex IV to MARPOL 73/78.

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

**3.1.5** The pipelines, electrical equipment and control devices shall comply with the requirements of the Administration.

**3.1.6** Equipment for collection, storage, treatment and discharge of sewage from MODU, FOP and FPU shall meet the requirements of the Administration.

#### 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** The holding tank shall be constructed to the satisfaction of the Administration and shall have a means to indicate visually the amount of its contents.

#### 3.3 SEWAGE TREATMENT PLANTS

**3.3.1** The capacity of the sewage treatment plant, in l/day, shall be determined by the formula

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

where  $n$  = number of persons;

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

**3.3.2** Sewage treatment plants specified in 3.1.2.1 and installed on passenger ships intending to discharge sewage effluent in special areas shall meet the requirements of IMO resolution MEPC.227(64), as amended by IMO resolution MEPC.284(70), with the dates set out in 3.1.3.

**3.3.3** Sewage treatment plants, except those specified in 3.1.2, installed on all ships shall meet the requirements of IMO resolution MEPC.227(64), with the exception of those in 4.2 of this resolution in respect of nitrogen and phosphorus removal standard, in the following cases:

**.1** when installed on board ships the keels of which are laid or which are at a similar stage of construction on or after 1 January 2016;

**.2** when delivered to other ships not specified in 3.3.3.1 with a contractual delivery date to the ship on or after 1 January 2016 or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 1 January 2016.

**3.3.4** For sewage treatment plants, requests for type approval of which were submitted after 28 October 2016, the Certificates of Type Approval shall be issued as per forms complying with the requirements of IMO resolution MEPC.284(70).

**3.3.5** In all other cases sewage treatment plants shall comply with the requirements of IMO resolutions MEPC.159(55) or MEPC.2(VI), as applicable.

**3.3.6** Sewage treatment plants shall be designed to be able to collect samples of treated waters.

### **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 3.3.4.

**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 systems shall ensure a degree of sewage disinfection in compliance with the requirements of the Administration.

### **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. The pipeline may be led to one side of the ship subject to the possibility of providing discharge to both sides of the ship. 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 MARPOL Annex IV (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 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, 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 IMO 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 shall 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.

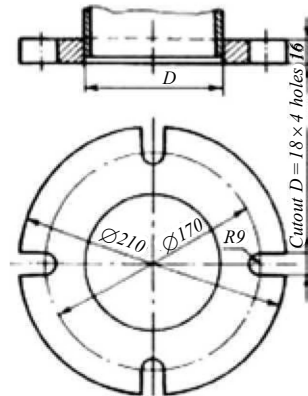


Fig. 3.5.1

**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.

## **4 INSTRUMENTATION**

**4.1** As effective means to indicate visually the amount of contents in sewage holding tanks, the electronic means may be used at all times to determine the level of sewage.

## **5 APPLICATION OF THE REQUIREMENTS OF ANNEX IV TO MARPOL 73/78 FOR SHIPS NOT COVERED BY THESE REQUIREMENTS**

**5.1** For ships of 400 gross tonnage not engaged on international voyages, as well as for the ships of less than 400 gross tonnage under the flag of the state, the Administration of which has authorized the Register, the standard sewage prevention pollution certificate (as per form 2.4.9) may be issued upon the shipowner's request according to 1.11.2, Part III "Survey of Ships in Compliance with International Conventions, Codes, Resolutions and Rules for the Equipment of Sea-Going Ships" of the Guidelines on Technical Supervision of Ships in Service upon results of the appropriate surveys, provided, at least, sewage holding tank of sufficient capacity and bilge water piping with the standard discharge connections are available on board as specified in 3.5.1.

## **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 this Part apply to all ships covered by the requirements of Annex V to MARPOL 73/78, as amended by IMO resolutions MEPC.265(68) and MEPC.277(70).

#### **1.2 DEFINITIONS AND EXPLANATIONS**

**1.2.1** For the purpose of this Part the following definitions and explanations have been adopted.

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

**Garbage** means all kinds of food, 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.

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

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

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

#### **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" of these Guidelines.

Every ship is subject to surveys as specified in 2.1.4, Part I "Regulations for Technical Supervision"

**1.3.2** Every ship of 100 gross tonnage and above, and every ship which is certified to carry 15 or more persons, and every floating facility or fixed platform engaged in the exploration, exploitation or associated offshore processing of seabed mineral resources shall carry a Garbage Management Plan which the crew shall follow.

Although the approval of Garbage Management Plan is not required by Annex V to MARPOL 73/78, it may be approved on behalf of Administrations which have given the Register the appropriate authorization. During review and approval of the Garbage Management Plan the requirements of IMO resolution MEPC.220(63) shall be considered.

**1.3.3** Every ship of 12 m or more in length overall and every floating facility or fixed platform engaged in the exploration, exploitation or associated offshore processing of seabed mineral resources shall display placards which notify of the garbage management requirements.

**1.3.4** 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.

**1.3.5** 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.

### **2.2 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** Taking into account the PSC requirements for garbage separation on board prior to its discharge to reception facilities, the separate garbage receptacles and storage locations shall be provided for the following garbage types:

- plastics and plastics mixed with non-plastic garbage;
- food wastes;
- domestic wastes: glass, metal, aluminium cans, bottles, wood, paper, cardboard, rags, crockery, etc.;
- cooking oil;
- incinerator ashes;
- operational wastes, including the garbage, that might present a hazard to the ship or crew (e.g. oily rags, light bulbs, acids chemicals, batteries, etc.);
- cargo residues (if applicable);
- animal carcasses (if applicable);
- fishing gear (if applicable);
- E-waste generated on board (e.g. electronic cards, gadgets, instruments, equipment, computers, printer cartridges, etc.).

Separate receptacles shall be provided for each type of garbage referred to "domestic wastes" category. The garbage receptacles of each above mentioned category shall be clearly marked.

**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 food wastes 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 for storing garbage to be processed. The space shall have fresh water washdown

service, coamings, deck drains and adequate ventilation. The fire-fighting equipment shall be in compliance with the requirements of Annex 2 to IMO resolution MEPC.244(66).

**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 IMO resolutions MEPC.59(33) or MEPC.76(40) or MEPC.244(66), whichever is applicable.

**2.4.2** Incinerators subjected to type approval on or after 4 April 2014 shall be tested in accordance with IMO resolution MEPC.244(66).

**2.4.3** 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 IMO resolutions MEPC.76(40) or MEPC.244(66), as applicable, 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 IMO resolutions MEPC.76(40) or MEPC.244(66) shall not be allowed.

**2.4.4** 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 IMO resolution MEPC.59(33) or other normative documents.

**2.4.5** 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 shutdown 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 residue (sludge) processing system (if available):

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

oil residue (sludge) preheating system;

homogenization system.

**2.4.6** Fire protection of incinerator and waste stowage spaces shall comply with the requirements of Annex 2 to IMO resolution MEPC.244(66).

## **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 this 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** For the purpose of this 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.

**Cargo ship having ice-breaking capability** in relation to Chapter 4 of Annex VI to MARPOL 73/78 means a cargo ship which is designed to break level ice independently with a speed of at least 2 knots when the level ice thickness is 1,0 m or more having ice bending strength of at least 500 kPa.

**Attained Energy Efficiency Design Index (EEDI)** means the EEDI value achieved by an individual ship in accordance with regulation 20 of Chapter 4, Annex VI to MARPOL 73/78.

**Fuel oil** means any fuel delivered to and intended for combustion purposes for propulsion or operation on board a ship, including gas, distillate and residual fuel.

**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:

- the engine is replaced by a marine diesel engine, or an additional marine diesel engine is installed; or
- any substantial modification, as defined in the revised NO<sub>x</sub> Technical Code is made to the engine; or
- the maximum continuous rating of the engine is increased by more than 10 % as compared to the maximum continuous rating of the initial survey of the engine.

**Major (substantial) conversion** means, in relation to Chapter 4 of Annex VI to MARPOL 73/78, a conversion of a ship:

- which substantially alters the dimensions, carrying capacity or engine power 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 the life of the ship; 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 to it as an existing ship; or
- which substantially alters the energy efficiency of the ship and includes any modifications that could cause the ship to exceed the applicable required EEDI calculated in accordance with regulation 21 of Annex VI to MARPOL 73/78.

**Identical engine** means, as compared to the engine being replaced<sup>1</sup>, an engine (refer to IMO circular MEPC.1/Circ.795/Rev.2) which is of the same:

- design and model;
- rated power;

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<sup>1</sup>In those instances where the replaced engine will not be available to be directly compared with the replacing engine at the time of updating the Supplement to IAPP Certificate reflecting that engine change it is to be ensured that the necessary records in respect of the replaced engine are available in order that it can be confirmed that the replacing engine represents an identical engine.

rated speed;

use;

number of cylinders;

fuel system type (including injection control software); and:

for engines without EIAPP certification, have the same NO<sub>x</sub> critical components and settings in compliance with the requirements of Annex VI to MARPOL 73/78<sup>1</sup>; or

for engines with EIAPP certification, belonging to the same engine group/engine family in respect of the engines with EIAPP certification in compliance with the requirements of Annex VI to MARPOL 73/78.

Calendar year means the period from 1 January until 31 December inclusive.

Conventional propulsion plant in relation to Chapter 4 of Annex VI to MARPOL 73/78 means a propulsion unit where a main reciprocating internal combustion engine(s) is the prime mover and coupled to a propulsion shaft either directly or through a gear box.

Cruise passenger ship in relation to Chapter 4 of Annex VI to MARPOL 73/78 means a passenger ship not having a cargo deck, designed exclusively for commercial transportation of passengers in overnight accommodations on a sea voyage.

Non-conventional propulsion plant in relation to Chapter 4 of Annex VI to MARPOL 73/78 means a propulsion plant, other than conventional one, including diesel-electric propulsion, turbine propulsion, and hybrid propulsion systems.

New ship means a ship for which the building contract is placed on or after 1 January 2013; or in the absence of a building contract, the keel of which is laid on or after 1 July 2013; or the delivery of which is on or after 1 July 2015.<sup>2</sup>

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.

<sup>1</sup>For engines without EIAPP certification in compliance with the requirements of Annex VI to MARPOL 73/78 there will not be the defining NO<sub>x</sub> critical component markings or setting values as usually given in the approved Technical File. Consequently in these instances the assessment of same NO<sub>x</sub> critical components and settings shall be established on the basis that the following components and settings are the same:

fuel system:

fuel pump model (type) and injection timing;

injection nozzle model (type);

charge air:

configuration and, if applicable, turbocharger model and auxiliary blower specification;

cooling medium (seawater/fresh water).

<sup>2</sup>In case it is impossible to determine the actual date of delivery, one shall be guided by IACS UI SC256/MPC100, according to which the date of delivery means the completion date of the survey on which the IAPP Certificate is based.

**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.

A ship delivered on or after 1 September 2019 in relation to Chapter 4 of Annex VI to MARPOL 73/78 means a ship:

for which the building contract is placed on or after 1 September 2015; 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 March 2016; or

the delivery of which is on or after 1 September 2019.

**Marine diesel engine** means any reciprocating internal combustion engine operating on liquid or dual fuel, to which regulation 13 of Annex VI to MARPOL 73/78 applies, including booster/compound systems if applied. In addition, a gas fuelled engine installed on a ship constructed on or after 1 March 2016 or a gas fuelled additional or non-identical replacement engine installed on or after that date is also considered as a marine diesel engine.

**Existing ship** means a ship which is not new.

**Required Energy Efficiency Design Index (EEDI)** means the maximum value of attained EEDI that is allowed by regulation 21 of Chapter 4, Annex VI to MARPOL 73/78.

**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 combustion machinery** 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 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 IMO resolution MEPC.259(68);

**.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 arrangement of approved design in compliance with IMO resolution MEPC.182(59);

**.6** cargo vapour discharge system in relation to availability of approved system on board tankers subject to control in relation to volatile organic compounds vapour emission;

**.7** shipboard incinerators.

**1.3.3** 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.

**1.3.4** In the case of ships of less than 400 gross tonnage, the Administration may establish appropriate measures in order to ensure that the applicable requirements of Chapter 3, 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 hydro-chlorofluorocarbons (HCFCs):  
on ships constructed on or after 19 May 2005; or  
in the case of ships constructed before 19 May 2005, which have a contractual delivery 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 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 IAPP 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 regardless of the gross tonnage (refer to IACS UI MPC14 (Rev.2 Aug 2018));

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.

In accordance with IMO circular MEPC.1/Circ.795/Rev.2, the term "time of the replacement or addition of the engine" shall be taken as the date of:

**.1** the contractual delivery date of the engine to the ship in the event the engine is fitted on board and tested for its intended purpose before 1 July 2016; or

**.2** in the absence of a contractual delivery date, the actual delivery date of the engine to the ship, provided that the date is confirmed by a delivery receipt, and the engine is fitted on board and tested for its intended purpose before 1 July 2016; or

**.3** the actual date that the engine is tested on board for its intended purpose in the event the engine is fitted on board and tested for its intended purpose on or after 1 July 2016.

The above dates are the dates of major conversion according to regulation 13.2.2 and, if necessary, shall be entered in the Supplement to IAPP Certificate (form 2.4.2.3). In this case, the "Date of installation," which applies only for identical replacement engines, shall be filled in with "N.A."

If the engine delivery contract is concluded before 1 January 2016 or if, in the absence of a contractual delivery date, the engine is delivered on board (the delivery date is confirmed by a delivery receipt) before 1 January 2016, but not tested before 1 July 2016 due to unforeseen circumstances beyond the control of the shipowner, then the "unforeseen delay in delivery" may be considered by the Administration in a manner similar to the provisions of paragraph 4 of the Unified Interpretations to MARPOL 73/78 Annex I. Existing IAPP Certificates (form 2.4.6) with Supplements (form 2.4.23) issued before 1 January 2013 without taking into account the above provisions are valid until their expiry (IACS UI MPC98).

In the case of replacement engines only (on the date specified in regulation 13.5.1.2 or 13.5.1.3 of Annex VI to MARPOL 73/78), if it is not possible for such a 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). The criteria of when it is not possible for replacement engine to meet the standards set forth in regulation 13.5.1.1 of Annex VI to MARPOL 73/78 are given in the 2013 Guidelines as Required by Regulation 13.2.2 of MARPOL Annex VI in Respect of Non-Identical Replacement Engines Not Required to Meet the Tier III limit (refer to IMO resolution MEPC.230(65)). The following criteria may be applied:

**.1** a replacement engine of similar rating complying with Tier III is not commercially available; or

**.2** the replacement engine, in order to be brought into Tier III compliance, needs to be equipped with a NO<sub>x</sub> reducing device which due to:

size cannot be installed in the limited space available on board; or

extensive heat release could have adverse impact on the ship's structure, sheeting, and/or equipment whilst additional ventilation and/or insulation of the engine-room/compartments will not be possible;

**.3** the replacement engine cannot be installed due to its dimensions and weight, as well as due to the fact that it cannot be integrated with the ship components (drive shafts, reduction gears, cooling systems, propeller shafts, etc.), systems and equipment;



.4 adjustments of the replacement engine, which shall be equipped with the NO<sub>x</sub> reducing device, do not allow the joint operation of the engine and this device;

as well as other criteria indicated in IMO Guidelines mentioned above.

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 on or after 1 January 2000 but before 1 July 2010 the provisions of IACS UI MPC20 (Rev.1 Apr 2014) shall apply.

**2.2.4** If any substantial modification, as defined in the NO<sub>x</sub> Technical Code, 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 % as compared to the maximum continuous rating of the initial survey of the engine, then the NO<sub>x</sub> emission (calculated as the total weighted emission of NO<sub>2</sub>) 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** NO<sub>x</sub> emission limitations do not apply to:

emergency marine diesel engines;

marine diesel engines installed in lifeboats and to power any device or equipment intended to be used solely for emergencies on the ship on which it is installed;

marine diesel engines installed on ships not engaged in international voyages, provided that such engines are subject to an alternative NO<sub>x</sub> control measure established by the Administration;

marine diesel engines ensuring the operation of MODU, FOP and FPU process equipment engaged in exploration, exploitation and associated offshore processing of seabed mineral resources.

**2.2.6** Subject to regulation 13 of Annex VI to MARPOL 73/78, as amended by IMO resolution MEPC.251(66), the operation of a marine diesel engine is prohibited, except when the emission of NO<sub>x</sub> (calculated as the total weighted emission of NO<sub>2</sub>) 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 the North American Emission Control Area or the United States Caribbean Sea Emission Control Area;

1 January 2021 and operating in the Baltic Sea Emission Control Area or the North Sea Emission Control Area;

the ship is operating in a NO<sub>x</sub> Tier III emission control area, other than an emission control area described above, and constructed on or after the date of adoption of such an emission control area, or a later date as may be specified in the amendment designating the NO<sub>x</sub> Tier III emission control area, whichever is later:

3,4 g/kWh,	when $n$ is less than 130 rpm;
$9 \times n^{(-0,2)}$ 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.

Designation and location of a NO<sub>x</sub> Tier III emission control area are specified in paragraph 6 of regulation 13 of MARPOL Annex VI, as amended.

The Tier III standards shall not apply to:

a marine diesel engine installed on a ship with a length ( $L$ ), as defined in regulation 1.19 of Annex I to MARPOL 73/78, of less than 24 m when it has been specifically designed, and is used solely, for recreational purposes; or

a marine diesel engine installed on a ship with a combined nameplate diesel engine propulsion power of less than 750 kW if it is demonstrated, to the satisfaction of the Administration, that the ship cannot comply with the standards set forth in regulation 13.5.1.1 of Annex VI to MARPOL 73/78 because of design or construction limitations of the ship; or

a marine diesel engine installed on a ship constructed prior to 1 January 2021 of less than 500 gross tonnage, with a length ( $L$ ), as defined in regulation 1.19 of Annex I to MARPOL 73/78, of 24 m or over when it has been specifically designed, and is used solely, for recreational purposes.

For marine diesel engine installed on a ship which activities take place in a shipyard or other repair facility located in a NO<sub>x</sub> Tier III emission control area, the NO<sub>x</sub> Tier III emission standards are temporarily exempted provided the conditions specified in regulation 13 of MARPOL Annex VI (IMO resolution MEPC.286(71) "Amendments to MARPOL Annex VI (Designation of the Baltic Sea and the North Sea Emission Control Areas for NO<sub>x</sub> Tier III control) (Information to be included in the bunker delivery note)") are met.

**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 existing marine diesel engine mentioned above shall operate within the Tier I limits. For that purpose, the Administration of a Party to the 1997 Protocol (Annex VI to MARPOL 73/78) shall survey an approved method for that engine and submit notification of such survey to IMO. In respect of a new approved method developed and submitted to the Administration of a Party to the 1997 Protocol for survey after 4 April 2014, the Administration shall follow the requirements of the 2014 Guidelines in Respect of the Information to Be Submitted by an Administration to the Organization Covering the Certification of an Approved Method as Required under Regulation 13.7.1 of MARPOL Annex VI (refer to IMO resolution MEPC.242(66)).

Certification of an approved method shall be in accordance with Chapter 7 of the 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 %, increase fuel consumption by more than 2 % 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 does not exceed 375 SDR (definitions for the above formula are given in IMO circular MEPC.1/Circ.678).

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

installation of the approved method, as confirmed by initial survey using the verification procedure specified in the Approved Method File, including relevant entries to be made in the Supplement to IAPP Certificate (form 2.4.23) in accordance with the guidance in the IMO circular MEPC.1/Circ.849; or  
pre-certification survey of the engine on board the ship in accordance with Chapter 5 of the NO<sub>x</sub> Technical Code 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 Tier I limits), as a result of which the Technical File of Marine Diesel Engine has been approved, the EIAPP Certificate (form 2.4.40) has been issued, including relevant entries to be made in the Supplement to IAPP Certificate (form 2.4.23).

Compliance with the above requirement shall be demonstrated no later than the first survey for renewal of the IAPP 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.

Identification as to the applicability of an approved method, procedure in case where the approved method is not commercially available, survey confirming installation and retention of the approved method shall be carried out in compliance with the requirements of the 2014 Guidelines on the Approved Method Process given in IMO resolution MEPC.243(66).

In accordance with the amendments to regulation 13.7.3 of Annex VI to MARPOL 73/78 introduced by IMO resolution MEPC.258(67), the IAPP Certificate (form 2.4.23) shall indicate one of the following:  
an approved method has been applied pursuant to regulation 13.7.1.1 of Annex VI to MARPOL 73/78;  
the engine has been certified pursuant to regulation 13.7.1.2 of Annex VI to MARPOL 73/78;  
an approved method is not yet commercially available as described in regulation 13.7.2 of Annex VI to MARPOL 73/78; or  
an approved method is not applicable.

In accordance with the 2014 Guidelines on the Approved Method Process (IMO resolution MEPC.243(66)), the requirements for installation of the approved method for engines cannot be imposed on the shipowner in the following cases:

the approved method is not applicable in case where the approved method does not meet the applicability criteria as specified in these Guidelines;

the approved method is not commercially available, then the shipowner of the ship on which the approved method is subject to installation, shall demonstrate to the satisfaction of the Administration that the approved method is not commercially available despite best efforts to obtain it. In such a case the shipowner shall apply to the Administration, giving details of the efforts made to have installed the approved method. The Administration shall review that information and, if in agreement that the approved method is not at that time commercially available, a statement to that effect shall be duly provided to the shipowner. That statement shall be retained on board and be available at surveys or inspections as required. Thereafter the shipowner shall, in accordance with regulation 13.7.2 of Annex VI to MARPOL 73/78, reassess the commercial availability in a timely manner prior to the next annual survey, and if available, to have the approved method installed no later than that annual survey. If the approved method is still not available the above stated process shall be repeated. Thereafter, this process shall be repeated for each annual survey until the approved method is commercially available and hence installed.

**2.2.7** The surveys of diesel engine after the installation of the approved method shall be carried out at periodical surveys of the ship in accordance with the onboard verification procedure specified in the Approved Method File. The survey shall be conducted as part of a ship's survey in accordance with regulation 5 of Annex VI to MARPOL 73/78.

**2.2.8** 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 EIAPP 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.

**2.2.9** The tier and on/off status of marine diesel engines installed on board a ship to which the EIAPP Certificates have been issued confirming that they are certified to both Tier II and Tier III or that they are certified to Tier II only shall be recorded in such logbook, as prescribed by the Administration, at entry into and exit from a NO<sub>x</sub> Tier III emission control area, or when the on/off status changes within such an area, together with the date, time and position of the ship (IMO resolution MEPC.271(69)).

### 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 if the ship is not required to have the IAPP Certificate (form 2.4.6):

- 4,50 % m/m prior to 1 January 2012;
- 3,50 % m/m on and after 1 January 2012;
- 0,50 % 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 if the ship is not required to have the IAPP Certificate (form 2.4.6):

- 1,50 % m/m prior to 1 July 2010;
- 1,00 % m/m on and after 1 July 2010;
- 0,10 % m/m on and after 1 January 2015.

**2.3.3** An exhaust gas cleaning system for shipboard fuel oil combustion machinery approved by the Administration, taking into account the provisions of IMO resolution MEPC.259(68) 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 IMO resolution MEPC.259(68) during approval of the above exhaust gas cleaning systems 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)
4,50	195,0
3,50	151,7
1,50	65,0
1,00	43,3
0,50	21,7
0,10	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, and at the Administration's discretion, for ships of less than 400 gross tonnage (refer to IACS UI MPC29 (Rev.1 Apr 2014)), 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 sampling arrangement (sampler);
- .2 time-proportional automatic sampling arrangement;
- .3 flow-proportional automatic sampling arrangement.

Bunker delivery notes shall permanently be kept onboard even if the ship is not required to have the IAPP Certificate (form 2.4.6).

**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 12 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 IMO resolution MEPC.182(59) and IMO circular 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 sampling arrangement according to IMO 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 (VOC)**

**2.4.1** All oil tankers which are subject to VOC 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 on behalf of the Administration in accordance with the Standards for Vapour Emission Control Systems (refer to IMO circular MSC/Circ.585).

**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 VOC Management Plan approved by the Administration. Such a plan shall be prepared in accordance with IMO resolution MEPC.185(59), as well as MEPC.1/Circ.680 and MEPC.1/Circ.719. The requirement for such plans applies only to a tanker carrying crude oil.

## **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" of these Guidelines.

**2.5.3** In accordance with IMO circular MEPC.1/Circ.642 shipboard incineration of oil residues (sludge) shall be allowed in the following approved plants:

incinerators with appropriate system of oil residue (sludge) processing system;

auxiliary steam boilers with appropriate system of oil residue (sludge) processing system;

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

inert gas systems with appropriate system of oil residue (sludge) processing system.

**2.5.4** The introduction of oil residues (sludge), generated during normal operation of a ship, into a continuous-feed type incinerator during the warm-up process at combustion chamber temperatures above 500 °C in order to achieve the normal operation combustion chamber temperature of 850 °C is considered acceptable. The conditions need to be fulfilled to secure smokeless and complete combustion: the combustion chamber flue gas outlet temperature shall be above 850 °C and the combustion chamber temperature (material temperature of the fire brickwork) shall be above 500 °C. The combustion chamber flue gas outlet temperature shall reach 850 °C within the period of time specified in the manufacturer's operations manual but shall not be more than 5 min.

## **2.6 REGULATIONS ON ENERGY EFFICIENCY FOR SHIPS**

**2.6.1** Chapter 4 "Regulations on Energy Efficiency for Ships" of Annex VI to MARPOL 73/78 introduced by IMO resolution MEPC.203(62), as amended by IMO resolution MEPC.251(66), applies to all ships of 400 gross tonnage and above, except for ships not propelled by mechanical means, and platforms including FPSO and FSU, MODU, regardless of their propulsion, and FOP.

**2.6.2** In compliance with regulations 20 and 21 of Annex VI, the attained (calculated) EEDI and required (maximum) EEDI shall be determined for the following ships:

- new ships;
- new ships which have undergone a major conversion;
- new or existing ships which have undergone a major conversion that is so extensive that the ships are regarded by the Administration as a newly constructed ship.

**2.6.3** The attained and required EEDI shall apply only to the above mentioned ships of the types specified therein, namely:

- bulk carrier;
- gas carrier (a cargo ship, other than an LNG carrier, intended for the carriage in bulk of any liquefied gas);
- LNG carrier (a cargo ship intended for the carriage in bulk of liquefied natural gas (LNG)) having conventional or non-conventional propulsion, delivered on or after 1 September 2019;
- tanker (an oil tanker, chemical tanker or tanker intended for the carriage of noxious liquid substances in bulk (NLS tanker));
- container ship;
- general cargo ship;
- ship designed exclusively for the carriage of refrigerated cargoes in holds, including the ship dedicated to the carriage of fruit juice in refrigerated cargo tanks (refrigerated cargo carrier);
- combination carrier;
- passenger ship (a ship which carries more than 12 passengers), no required EEDI applies;
- cruise passenger ships having non-conventional propulsion, delivered on or after 1 September 2019. From 1 September 2015 for cruise passenger ships having conventional propulsion only the attained EEDI applies;
- ro-ro cargo ship, delivered on or after 1 September 2019. For ro-ro cargo ships delivered before this date only the attained EEDI applies;
- ro-ro passenger ship, delivered on or after 1 September 2019. For ro-ro passenger ships delivered before this date only the attained EEDI applies.

The above requirements for attained or required EEDI shall not apply to cargo ships having ice-breaking capability as well as to ships which have non-conventional propulsion, except that these requirements shall apply to cruise passenger ships and LNG carriers as specified above.

The attained EEDI shall be calculated by the formula contained in the 2018 Guidelines on the Method of Calculation of the Attained Energy Efficiency Design Index (EEDI) for New Ships given in IMO resolution MEPC.308(73).

**2.6.4** In compliance with regulation 21, Annex VI to MARPOL 73/78 for ships of the types specified in this regulation, the attained EEDI shall be less than or equal to the required EEDI:

$$\text{Attained EEDI} \leq \text{Required EEDI} = (1 - X/100) \times \text{Reference line value.}$$

Required EEDI shall be multiplication of the reference line value for specific ship type and multiplier  $(1 - X/100)$ , where the reduction factor  $X$  is considered corresponding to the ship type and size, and four time phases (Table 2.6.4).

**2.6.5** To select the reduction factor  $X$  given in Table 2.6.4 to a specific new ship depending on the date of the building contract or, in its absence, the date of keel laying and delivery date, the following is applied.

**2.6.5.1** The reduction factor  $X$  of Phase 0 is applied to the following new ships:

- .1 for which the building contract is placed in Phase 0, and the delivery is before 1 January 2019; or
- .2 the building contract of which is placed before Phase 0, and the delivery is on or after 1 July 2015 and before 1 January 2019; or
- in the absence of a building contract:
- .3 the keel of which is laid or which are at a similar stage of construction on or after 1 July 2013 and before 1 July 2015, and the delivery is before 1 January 2019; or
- .4 the keel of which is laid or which are at a similar stage of construction before 1 July 2013, and the delivery is on or after 1 July 2015 and before 1 January 2019.

Table 2.6.4

Type of ship	Deadweight (DWT)	Phase 0 1 January 2013 — 31 December 2014	Phase 1 1 January 2015 — 31 December 2019	Phase 2 1 January 2020 — 31 December 2024	Phase 3 1 January 2025 and onwards
Bulk carrier	20000 DWT and above	0	10	20	30
	10000 — 20000 DWT	N/A	0 — 10 <sup>1</sup>	0 — 20 <sup>1</sup>	0 — 30 <sup>1</sup>
Gas carrier	10000 DWT and above	0	10	20	30
	2000 — 1000 DWT	N/A	0 — 10 <sup>1</sup>	0 — 20 <sup>1</sup>	0 — 30 <sup>1</sup>
Tanker	20000 DWT and above	0	10	20	30
	4000 — 20000 DWT	N/A	0 — 10 <sup>1</sup>	0 — 20 <sup>1</sup>	0 — 30 <sup>1</sup>
Container ship	15000 DWT and above	0	10	20	30
	10000 — 15000 DWT	N/A	0 — 10 <sup>1</sup>	0 — 20 <sup>1</sup>	0 — 30 <sup>1</sup>
General cargo ship	15000 DWT and above	0	10	15	30
	3000 — 15000 DWT	N/A	0 — 10 <sup>1</sup>	0 — 15 <sup>1</sup>	0 — 30 <sup>1</sup>
Refrige-rated cargo carrier	5000 DWT and above	0	10	15	30
	3000 — 5000 DWT	N/A	0 — 10 <sup>1</sup>	0 — 15 <sup>1</sup>	0 — 30 <sup>1</sup>
Combination carrier	20000 DWT and above	0	10	20	30
	4000 — 20000 DWT	N/A	0 — 10	0 — 20	0 — 30 <sup>1</sup>
LNG carrier <sup>2</sup>	10000 DWT and above	N/A	10 <sup>3</sup>	20	30
Ro-ro cargo ship (vehicle carrier) <sup>2</sup>	10000 DWT and above	N/A	5 <sup>3</sup>	15	30
Ro-ro cargo ship <sup>2</sup>	2000 DWT and above	N/A	5 <sup>3</sup>	20	30
	1000 — 2000	N/A	0 — 5 <sup>1, 3</sup>	15 <sup>1</sup>	30 <sup>1</sup>
Ro-ro passenger ship <sup>2</sup>	1000 DWT and above	N/A	5 <sup>3</sup>	20	30
	250 — 1000 DWT	N/A	0 — 5 <sup>1, 3</sup>	0 — 20 <sup>1</sup>	0 — 30 <sup>1</sup>
Cruise passenger ship <sup>2</sup> having non-conventional propulsion	85000 GT and above	N/A	5 <sup>3</sup>	20	30
	25000 — 85000 GT	N/A	0 — 5 <sup>1, 3</sup>	0 — 20 <sup>1</sup>	0 — 30 <sup>1</sup>

<sup>1</sup>Reduction factor  $X$  shall be linearly interpolated between the two values dependent upon vessel size. The lower value of the reduction factor  $X$  shall be applied to the smaller ship size.

<sup>2</sup>Reduction factor applies to those ships delivered on or after 1 September 2019.

<sup>3</sup>Phase 1 commences for those ships on 1 September 2015.

Note. N/A means that no required EEDI applies.

**2.6.5.2** The reduction factor  $X$  of Phase 1 is applied to the following new ships:

- .1** for which the building contract is placed in Phase 1, and the delivery is before 1 January 2024; or
- .2** the building contract of which is placed before Phase 1, and the delivery is on or after 1 January 2019 and before 1 January 2024; or
- in the absence of a building contract:
- .3** the keel of which is laid or which are at a similar stage of construction on or after 1 July 2015 and before 1 July 2020, and the delivery is before 1 January 2024; or
- .4** the keel of which is laid or which are at a similar stage of construction before 1 July 2015, and the delivery is on or after 1 January 2019 and before 1 January 2024.

**2.6.5.3** The reduction factor  $X$  of Phase 2 is applied to the following new ships:

- .1** for which the building contract is placed in Phase 2, and the delivery is before 1 January 2029; or
- .2** the building contract of which is placed before Phase 2, and the delivery is on or after 1 January 2024 and before 1 January 2029; or
- in the absence of a building contract:
- .3** the keel of which is laid or which are at a similar stage of construction on or after 1 July 2020 and before 1 July 2025, and the delivery is before 1 January 2029; or

.4 the keel of which is laid or which are at a similar stage of construction before 1 July 2020, and the delivery is on or after 1 January 2024 and before 1 January 2029.

**2.6.5.4** The reduction factor  $X$  of Phase 3 is applied to the following new ships:

.1 for which the building contract is placed in Phase 3; or

.2 in the absence of a building contract, the keel of which is laid or which are at a similar stage of construction on or after 1 July 2025; or

.3 the delivery of which is on or after 1 January 2029.

**2.6.6** Reference line value is the ship deadweight function. Reference line formula:

$$\text{Reference line} = a \times b^{-c}$$

where  $a$  and  $c$  = constants determined according to Table 2.6.6.

Table 2.6.6

Type of ship	$a$	$b$	$c$
Ro-ro cargo ship (vehicle carrier)	$(\text{DWT/GT})^{-0.7} \times 780,36$ where $\text{DWT/GT} < 0,3$ ; 1812,63 where $\text{DWT/GT} \geq 0,3$	Deadweight (DWT)	0,471
Ro-ro cargo ship	1405,15 1686,171	Deadweight (DWT)	0,498
Bulk carrier		Deadweight (DWT) of the ship, where $\text{DWT} \leq 17000^1$	
Ro-ro passenger ship	961,79 752,16 902,59 <sup>1</sup>	or 17000, where $\text{DWT} > 17000^1$ Deadweight (DWT)	0,477
		Deadweight (DWT)	0,381
		Deadweight (DWT of the ship, where $\text{DWT} \leq 10000^1$	
		or 10000, where $\text{DWT} > 10000^1$	
Gas carrier	1120,00	Deadweight (DWT)	0,456
LNG carrier	2253,7	Deadweight (DWT)	0,474
Tanker	1218,80	Deadweight (DWT)	0,488
Container ship	174,22	Deadweight (DWT)	0,201
Cruise passenger ship having non conventional propulsion	170,84	Gross tonnage (GT)	0,214
General cargo ship	107,48	Deadweight (DWT)	0,216
Refrigerated cargo ship	227,01	Deadweight (DWT)	0,244
Combination carrier	1219,00	Deadweight (DWT)	0,488
<sup>1</sup> To be used from phase 2 and thereafter.			

The reference line shall be calculated in compliance with the 2013 Guidelines for Calculation of Reference Lines for Use with EEDI given in IMO resolution MEPC.231(65) (for ship types defined in regulation 2, Annex VI to MARPOL 73/78), and in accordance with IMO resolution MEPC.233(65) (for cruise passenger ships having non-conventional propulsion).

**2.6.7** For each ship to which regulation 21 applies, the installed propulsion power shall not be less than the propulsion power needed to maintain the manoeuvrability of the ship under adverse conditions.

The minimum propulsion power shall be determined in compliance with the 2013 Interim Guidelines for Determining Minimum Propulsion Power to Maintain the Manoeuvrability of Ships in Adverse Conditions given in IMO resolution MEPC.232(65), as amended by IMO resolution MEPC.262(68).

**2.6.8** In compliance with regulation 22, Annex VI to MARPOL 73/78 each ship (new and existing) of 400 gross tonnage and above shall keep on board SEEMP except for the platforms (floating offshore oil and gas production units (FPSO and FSU), MODU and FOP) and any non-self-propelled ships.

**2.6.9** The IEE Certificate (form 2.4.3) with Supplement (form 2.4.3.1) may be issued for the existing ship not covered by regulations 20 and 21 of Annex VI to MARPOL 73/78, provided the SEEMP is available on board the ship.

**2.6.10** The SEEMP shall be developed by the shipowner, operator or any interested party as a ship-specific plan in compliance with the 2016 Guidelines for the Development of a Ship Energy Efficiency Management Plan (SEEMP) given in IMO resolution MEPC.282(70).



**2.6.11** On or before 31 December 2018, in the case of a ship of 5000 gross tonnage and above, the SEEMP shall include a description of the methodology that ships will use to collect the ship fuel oil consumption data and the processes that the ship will use to report the data to the Administration or any organization duly authorized by it, in accordance with IMO resolution MEPC.282(70).

**2.6.12** Verification of compliance with 2.6.11, issued by the Administration, shall be submitted on or before 31 December 2018 and shall be kept on board.

**2.6.13** In accordance with IMO resolution MEPC.278(70) "Amendments to MARPOL Annex VI (Data collection system for fuel oil consumption of ships)", from 1 January 2019, every ship of 5000 gross tonnage and above, on which SEEMP is required, shall ensure collecting data on fuel oil consumption, distance travelled over ground and hours underway, using methods and procedures set out in SEEMP.

**2.6.14** Within three months after the end of each calendar year, the ship shall report to its Administration or recognized organization duly authorized by it the aggregated value for each datum specified in Appendix IX to IMO resolution MEPC.278(70), via electronic communication and using a standardized format in accordance with Appendix 3 to IMO resolution MEPC.282(70). Upon completion of verification of reported data (the aggregated values) in accordance with the procedures developed taking into account the 2017 Guidelines for Administration Verification of Ship Fuel Oil Consumption Data specified in IMO resolution MEPC.292(71), and based on satisfactory verification results, the Administration or recognized organization duly authorized by it shall issue the Statement of Compliance as per form given in Appendix X to IMO resolution MEPC.278(70) related to fuel oil consumption to the ship no later than five months from the beginning of the calendar year.

**2.6.15** The verification of the requirement to have a SEEMP on board according to regulation 5.4.4 of Annex VI to MARPOL 73/78, shall take place at the first intermediate survey or survey for renewal of the IAPP Certificate (form 2.4.6) with Supplement (form 2.4.23), performed on or after 1 January 2013 (whichever is the first). The SEEMP is not required on board before these surveys.

Upon results of the above mentioned survey, in addition to endorsement or issue of the IAPP Certificate (form 2.4.6), the IEE Certificate (form 2.4.3) with Supplement (form 2.4.3.1) may be issued. The IEE Certificate may be issued to every ship of 400 gross tonnage and above engaged in international voyages for the entire service life of this ship.

In the event that the SEEMP is not available on board during the above mentioned surveys, the advice of the Administration concerning the issuance of the IEE Certificate shall be sought in accordance with IMO circular MEPC.1/Circ.795/Rev.2. However, the endorsement or issue of the IAPP Certificate is not impacted by the lack of SEEMP on board.

**2.6.16** For ships, which are not required to keep SEEMP on board (refer to 2.6.8), the above IEE Certificates with Supplements are not issued.

**2.6.17** In accordance with the 2014 Guidelines on Survey and Certification of EEDI given in IMO resolution MEPC.254(67), as amended by IMO resolutions MEPC.261(68) and MEPC.309(73), ship survey in relation to EEDI shall be conducted in two stages:

1 stage: preliminary validation of requirements in relation to EEDI at the design stage with review of EEDI Technical File; and

2 stage: final survey of the ship during sea trials, upon which results the amendments to EEDI Technical File are introduced, if necessary, and the IEE Certificate (form 2.4.3) with Supplement (form 2.4.3.1) shall be issued.

**2.6.18 Preliminary verification at the design stage.**

**2.6.18.1** For the preliminary verification at the design stage, the shipowner shall submit to the Register, acting on behalf of the Administration, an appropriate application and the EEDI Technical File containing the necessary information for the EEDI verification and other relevant background documents.

**2.6.18.2** The EEDI Technical File, which shall be developed by the shipowner or shipyard, shall include at least the following:

- deadweight (DWT) or gross tonnage (GT) for passenger ships;
- the maximum continuous rating (MCR) of the main and auxiliary engines;
- the ship speed on deep water and under the maximum design loading condition;

specific fuel consumption (SFC) of the main engine at 75 % of MCR power, the SFC of the auxiliary engines at 50 % of MCR power;  
electric power table for certain types of ships as defined in the 2018 Guidelines on the Method of Calculation of the Attained EEDI for New Ships given in the IMO resolution MEPC.308(73);  
speed-power curve(s) of the main engine determined and estimated at design stage under the full loading condition;  
overview of propulsion plant and electricity supply system on board;  
description of energy saving equipment; and  
calculated value of the attained EEDI.

The EEDI Technical File shall be issued at least in English.

For ships covered by the provisions of paragraph 2.2.5.7 in IMO resolution MEPC.308(73), the electric power table shall be validated in accordance with Appendix 2 to the 2014 Guidelines on Survey and Certification of EEDI given in IMO resolution MEPC.254(67), as amended by IMO resolutions MEPC.261(68) and MEPC.309(73).

**2.6.18.3** Preliminary verification at design stage shall be focused on calculation of attained EEDI in accordance with IMO Guidelines specified in 2.6.3.

Upon results of the EEDI preliminary verification at design stage, the Register shall issue the Report on Preliminary Verification of the Ship's EEDI (form 6.4.3).

**2.6.19 Final verification at sea trials.**

**2.6.19.1** Prior to the sea trials the shipowner shall submit to the Register the following documents:  
test program, including the tests for determining speed of the ship in compliance with IMO Guidelines specified in 2.6.17;

final displacement table indicating the lightship displacement;  
copies of NO<sub>x</sub> Technical Files, where necessary.

**2.6.19.2** Upon results of the sea trials the Register shall confirm the following:  
data on propulsion plant and power supply system, and other essential equipment described in the EEDI Technical File;  
draught and trim;  
sea conditions;  
ship speed;

shaft power measured according to manufacturer's recommendations and RPM of the main engine; and  
that the values given in the electric power table are in accordance with those specified in 2.6.18.2.

**2.6.19.3** The shipyard shall develop power curves based on the measured ship speed and the measured output of the main engine at sea trial. Then the shipyard shall compare the power curves obtained as a result of the sea trial and the estimated power curves at the design stage. In case differences are observed, the attained EEDI shall be recalculated, as necessary, in accordance with the conditions in 4.3.8 of IMO Guidelines specified in 2.6.17.

The EEDI Technical File shall be revised, as necessary, by taking into account the results of sea trial.

The EEDI Technical File, if revised, shall be submitted to the Register for the confirmation that the revised attained EEDI is calculated in accordance with IMO Guidelines specified in 2.6.3.

**2.6.19.4** At the initial survey of the ship for compliance with the above requirements, the Register shall issue a Report on Survey of the Ship (form 6.4.4) to verify that upon results of the sea trials the attained EEDI complies with the requirements, and that the SEEMP is available onboard.

Upon satisfactory results, the IEE Certificate (form 2.4.3) with Supplement (form 2.4.3.1) shall be issued for the ship.

**2.6.20** For preliminary and final verification of compliance with the EEDI requirements, the IACS PR38 (for ships contracted for construction before 1 July 2019 — refer to Rev.1 Mar 2016; for ships contracted for construction on or after 1 July 2019 — refer to Rev.2 Mar 2019) "Procedure for Calculation and Verification of EEDI" which contains the Industry Guidelines for Calculation and Verification of EEDI shall be also applied.

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

**3.1** In compliance with regulation 3.3.1.4 of Annex VI to MARPOL 73/78, emissions from marine diesel engines that are solely dedicated to the exploration, exploitation and associated offshore processing of seabed mineral resources are not subject to control in accordance with Annex VI to MARPOL 73/78.

**3.2** In compliance with regulation 3.3.2 of Annex VI to MARPOL 73/78, the requirements of regulation 18 of Annex VI 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.

**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.

## **INSTRUCTIONS ON THE IMPLEMENTATION OF REVISED ANNEX V TO MARPOL 73/78**

### **1 NORMATIVE DOCUMENTS**

The Instructions on the Implementation of Revised Annex V to MARPOL 73/78 have been developed taking into account the requirements and recommendations of the main international documents regarding prevention of pollution by garbage:

revised Annex V to MARPOL 73/78 (IMO resolution MEPC.201(62), as amended by IMO resolutions MEPC.265(68) and MEPC.277(70));

the 2017 Guidelines for the Implementation of MARPOL Annex V (IMO resolution MEPC.295(71)); and  
the 2012 Guidelines for the Development of Garbage Management Plans (IMO resolution MEPC.220(63)).

### **2 SEPARATION OF GARBAGE INTO THE CATEGORIES**

In compliance with the previous revision of Annex V to MARPOL 73/78, the garbage shall be grouped into the following categories:

- plastics;
- floating dunnage, lining and packing materials;
- comminuted paper, rags, metal, glass, bottles, crockery, etc.;
- cargo residues, paper, rags, glass, metal, bottles, crockery, etc.;
- food wastes;
- incinerator ashes.

In compliance with the previous of the Guidelines for the Implementation of MARPOL Annex V, the following three receptacles shall be provided:

- plastics;
- food wastes;
- other garbage.

In the receptacles for "other garbage" the garbage of several categories might be stored which might be discharged outside special areas at a distance of 12 miles or more from the nearest land. Since the garbage of the category "floating dunnage, lining and packing materials" may be discharged outside special areas at a distance of 25 miles or more from the nearest land, the garbage in this category shall be collected and stored separately.

After the revised Annex V to MARPOL 73/78 entering into force, the requirements for the garbage separation into categories given in the revised Garbage Record Book have been amended. In compliance with new requirements, the garbage shall be separated into the following categories, as stated in the relevant regulations of the revised Annex V to MARPOL 73/78:

- A — plastics (regulation 1.13);
- B — food wastes (regulation 1.8);
- C — domestic wastes (regulation 1.4);
- D — cooking oil (regulation 1.3);
- E — incinerator ashes (regulation 1.10);
- F — operational wastes (regulation 1.12);
- G — animal carcass(es) (regulation 1.1);
- H — fishing gear (regulation 1.6);
- I — E-waste;

J — cargo residues (classified as not harmful to the marine environment (non-HME));

K — cargo residues (classified as harmful to the marine environment (HME)).

The new garbage categories have been introduced: "C — domestic wastes", "D — cooking oil", "F — operational wastes", "G — animal carcass(es)", "H — fishing gear", "I — E-waste" and "J and K — cargo residues".

### **3 COLLECTION OF GARBAGE**

In accordance with 2.4 of the 2017 Guidelines for the Implementation of MARPOL Annex V given in IMO resolution MEPC.295(71), the procedures for collecting garbage generated on board shall be based on the consideration of what is permitted and what is not permitted to be discharged into the sea while en route, and whether a particular garbage type can be discharged to port facilities for recycling or reuse.

The recommended garbage types that shall be separated are:

non-recyclable plastics and plastics mixed with non-plastic garbage;

rags;

recyclable material:

cooking oil;

glass;

aluminium cans;

paper, cardboard, corrugated board;

wood;

metal;

plastics (including styrofoam or other similar plastic material);

garbage that might present a hazard to the ship or crew (e.g. oily rags, light bulbs, acids, chemical, batteries, etc.);

E-waste generated on board (e.g. electronic cards, gadgets, instruments, equipment, computers, printer cartridges, etc.).

The details of these procedures shall be written in the Garbage Management Plan.

To collect garbage of the categories specified above in Section 2 the following garbage receptacles shall be provided on board. The requirements thereto are given in 2.2, Part V "Ship's Equipment and Arrangements for the Prevention of Pollution by Garbage" of these Guidelines.

Separate categories of garbage, such as "domestic wastes" and "operational wastes" may be collected in drums, metal bins, cans, container bags, etc.

To avoid the need for sorting the garbage after collection, the garbage receptacles shall be distinctively marked.

Any garbage receptacles on weather decks shall be secured and have tight covers.

### **4 GARBAGE PROCESSING**

Depending on the ship's type, area of navigation, number of crew and passengers, available port reception facilities, etc. the ships may be equipped with incinerators, compactors, comminutors or other devices for shipboard garbage processing.

Incineration of food wastes in the incinerators approved for food wastes incineration may appear to be a solution for their discharge to the sea, also in a comminuted form.

#### **4.1 Incinerators**

The incinerators installed onboard the ships shall meet the requirements of 2.4, Part V "Ship's Equipment and Arrangements for the Prevention of Pollution by Garbage" of these Guidelines.

In accordance with regulation 16 of Annex VI to MARPOL 73/78, the incinerators installed on board the ships, the keels of which were laid on or after 1 January 2000, shall comply with the requirements of IMO resolution MEPC.76(40) or MEPC.244(66), as applicable, and shall be type approved by the Administration.

Procedures for garbage incineration in the incinerators are given in 2.11 of these Guidelines.

#### **4.2 Comminutors**

In compliance with regulations 4.1.1 and 6.1.1 of Annex V to MARPOL 73/78, the discharge of food wastes when the ship is en route is only permitted in a comminuted form in the following cases:

- the ship is operating outside special areas at a distance of 3 miles or more from the nearest land;
- the ship is operating inside special areas at a distance of 12 miles or more from the nearest land.

Such a discharge is possible, provided the comminuted food wastes must be capable of passing through a screen with openings not greater than 25 mm.

To provide comminution of food wastes on board the ships operating in the above special areas, it is recommended to install the comminutors, providing the above conditions of disposal are met.

The comminutor design shall provide recycling of food wastes into a slurry of food particles and water that washes easily through the required screen. Output ranges from 10 to 250 l/min may be provided.

In compliance with 2.9.2 of the 2017 Guidelines for the Implementation of MARPOL Annex V given in IMO resolution MEPC.295(71), the discharge of food wastes from the shipboard comminutor shall be directed into an appropriately constructed holding tank when the ship is operating within the areas where the discharge of comminuted food wastes is prohibited. The discharge of comminuted food wastes into sewage tank is not recommended, due to the fact that in accordance with Annex IV to MARPOL 73/78 untreated sewage may be discharged at a distance of 12 miles or more from the nearest land, including outside the special areas specified in accordance with Annex V to MARPOL 73/78, and provided the food wastes are available in sewage, more stringent requirements on discharge shall be met, that is, the requirements for discharge specified by Annex IV to MARPOL 73/78 (e.g. in case of discharge into the sea of food wastes with sewage within 12 miles from the nearest land outside a special area), otherwise it will be a violation of the discharge requirements in MARPOL 73/78. Besides, when the sewage treatment plant is available onboard, it is necessary to have the equipment manufacturer's endorsement that such equipment is designed for processing comminuted food wastes. It is also not recommended to discharge the comminuted food wastes to a holding tank of sanitary and domestic waste waters because the discharge of sanitary and domestic waste waters is not regulated by the requirements of MARPOL 73/78 and may be performed in all areas, and provided the food wastes are available in these waters, such discharge within 12 miles from the nearest land inside a special area will be a violation of discharge requirements of Annex V to MARPOL 73/78.

Procedures for garbage comminutions are specified in 2.9 of the 2017 Guidelines for the Implementation of MARPOL Annex V given in IMO resolution MEPC.295(71).

In compliance with Appendix 1, Part I "General Regulations for Technical Supervision" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships, the comminutors refer to the items of the Register technical supervision "Garbage treatment plants" (code 19140000MK of the Nomenclature of Items of the Register Technical Supervision), the types of technical supervision for which are indicated in the Nomenclature.

Technical documentation on the comminutor intended for installation shall be developed in compliance with the requirements of Annex V to MARPOL 73/78, the 2017 Guidelines for the Implementation of MARPOL Annex V given in IMO resolution MEPC.295(71), and the Register requirements. Upon review and approval of the documentation and performance of the relevant survey, the Certificate (form 6.5.30) shall be issued by the Register.

The approval of the comminutor design by other classification societies may be considered during the technical supervision of the Register.

#### **4.3 Compactors**

Compactors are designed to reduce the shipboard space requirements for storing garbage, and make it easier to discharge garbage at reception facilities.

Procedures for garbage compaction are given in 2.10 of the 2017 Guidelines for the Implementation of MARPOL Annex V given in IMO resolution MEPC.295(71).

The requirements to these arrangements are given in 2.3, Part V "Ship's Equipment and Arrangements for the Prevention of Pollution by Garbage" of these Guidelines.

The compactors shall be installed in a compartment with adequate room for operating the unit and for storing garbage to be processed. The compartment shall have freshwater wash down service, coamings, deck drains, adequate ventilation and fire-fighting equipment.

Garbage compactors shall be installed in a compartment with adequate room for operating the unit and for storing garbage to be processed. The compartment shall have freshwater washdown service, coamings, deck drains and adequate ventilation. The fire-fighting equipment shall be in compliance with the requirements of Annex 2 to IMO resolution MEPC.244(66).

## **5 GARBAGE STORAGE**

The garbage receptacles shall be located in places convenient for permitted garbage discharge 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 stored in a manner which avoids health and safety hazards. Some requirements for the garbage receptacles are given in IMO resolution MEPC.244(66). In order to reduce fire risks to these spaces shall be applied the requirements of Chapter II-2 of SOLAS 74 (regulation II-2/3.12).

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

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

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

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

The separate garbage receptacles shall be provided for the following garbage categories:

plastics and plastics mixed with non-plastic garbage;

food wastes;

domestic wastes; glass, metal, aluminium cans, bottles, wood, paper, cardboard, rags, etc.);

cooking oil;

incinerator ashes;

operational wastes, including the garbage that might present a hazard to the ship or crew (e.g. oily rags, light bulbs, acids, chemicals, batteries, etc.);

E-waste generated on board (e.g. electronic cards, gadgets, monitors, computers, batteries, cartridges and printer toners, etc.);

cargo residues (if applicable);

animal carcasses (if applicable);

fishing gear (if applicable).

For each type of garbage, which is referred to "domestic wastes" category, the separate receptacles are recommended.

The garbage receptacles of each above mentioned category shall be clearly marked.

For storage of the garbage referred to "cargo residues", "animal carcasses" and "fishing gear" categories, storage areas may be provided to provide securing of this garbage to the ship structures.

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 as well as standards of garbage depositing per one person per day shall be submitted to the Register in compliance with the requirements of the ship's Flag Administrations.

According to the Sanitary Rules for Sea-Going Vessels, 1982 currently in force for the ships flying the RF flag, the standards of garbage depositing per one person are as follows:

dry domestic wastes — 0,002 m<sup>3</sup>;

solid food wastes — 0,003 m<sup>3</sup>.

## 6 GARBAGE DISCHARGE

In accordance with regulations 4, 5 and 6 of the revised Annex V to MARPOL 73/78, the discharge of garbage of categories "B — food wastes", "J — cargo residues (classified as non-HME)" and "G — animal carcasses" is permitted depending on the area of the ship's operation and subject to the conditions specified in the regulations stated above.

Discharge of garbage of other types is prohibited except for cleaning agents or additives contained in cargo hold washwater, deck or external surface washwater only if they are not harmful to the marine environment.

New requirements for discharge of garbage from ships are given in the Table below.

Table

Garbage type <sup>1</sup>	All ships except platforms <sup>2</sup>		Offshore platforms located more than 12 miles from nearest land and ships when alongside or within 500 m of such platforms <sup>2</sup> or within 500 m of such platforms
	Outside special areas and Arctic waters (Distances are from the nearest land)	Within special areas and Arctic waters (Distances are from nearest land, nearest ice-shelf or nearest fast ice)	
Food waste comminuted or ground <sup>3</sup>	≥ 3 miles, en route and as far as practicable	≥ 12 miles, en route and as far as practicable <sup>4</sup>	Discharge permitted
Food waste not comminuted or ground	≥ 12 miles, en route and as far as practicable	Discharge prohibited	Discharge prohibited
Cargo residues <sup>5, 6</sup> not contained in washwater	≥ 12 miles, en route and as far as practicable	Discharge prohibited	Discharge prohibited
Cargo residues <sup>5, 6</sup> contained in washwater		≥ 12 miles, en route and as far as practicable (subject to conditions in regulation 6.1.2 and paragraph 5.2.1.5 of part II-A of the Polar Code)	
Cleaning agents and additives <sup>6</sup> contained in cargo hold washwater	Discharge permitted	≥ 12 miles, en route and as far as practicable (subject to conditions in regulation 6.1.2 and paragraph 5.2.1.5 of part II-A of the Polar Code)	Discharge prohibited
Cleaning agents and additives <sup>6</sup> contained in deck and external surface washwater		Discharge permitted	
Animal carcasses (shall be split or otherwise treated to ensure the carcasses will sink immediately)	The ship shall be en route and as far from the nearest land as possible. Shall be >100 miles and maximum water depth	Discharge permitted	Discharge prohibited
All other garbage including plastics, synthetic ropes, fishing gear, plastic garbage bags, incinerator ashes, clinkers, cooking oil, floating dunnage, lining and packing materials, paper, rags, glass, metal, bottles, crockery and similar refuse	Discharge prohibited	Discharge prohibited	Discharge prohibited

<sup>1</sup>When garbage is mixed with or contaminated by other harmful substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply.

<sup>2</sup>Offshore platforms located 12 miles from nearest land and associated ships include all fixed or floating platforms engaged in exploration or exploitation or associated processing of seabed mineral resources, and all ships alongside or within 500 m of such platforms.

<sup>3</sup>Comminuted or ground food wastes shall be able to pass through a screen with mesh no larger than 25 mm.

<sup>4</sup>The discharge of introduced avian products in the Antarctic area is not permitted unless incinerated, autoclaved or otherwise treated to be made sterile. In polar waters, discharge shall be made as far as practicable from areas of ice concentration exceeding 1/10; in any case food wastes shall not be discharged onto the ice.

<sup>5</sup>Cargo residues means only those cargo residues that cannot be recovered using commonly available methods for unloading.

<sup>6</sup>These substances shall not be harmful to the marine environment.



Releasing small quantities of food into the sea for the specific purpose of fish feeding in connection with fishing or tourist operations shall not be considered as discharge of garbage in the context of Annex V to MARPOL 73/78.

## **7 MANAGEMENT OF CARGO RESIDUES OF SOLID BULK CARGOES**

Cargo residues are included in the definition of garbage within the meaning of regulation 1.9 of Annex V to MARPOL 73/78 and may be discharged in accordance with regulations 4.1.3 and 6.1.2 and paragraph 5.2.1.5 of part II-A of the Polar Code. However, cargo material contained in the cargo hold bilge water shall not be treated as cargo residues if the cargo material is not harmful to the marine environment and the bilge water is discharged from a loaded hold through the ship's fixed piping bilge drainage system.

Cargo residues are considered harmful to the marine environment and subject to regulations 4.1.3 and 6.1.2.1 of Annex V to MARPOL 73/78 if they are residues of solid bulk cargoes (other than grain) which are classified according to the criteria set out in Appendix I of Annex V to MARPOL 73/78 as amended by IMO resolution MEPC.277(70).

Solid bulk cargoes, as defined in regulation VI/1-1.2 of SOLAS 74, as amended, other than grain, shall be classified in accordance with Appendix I of Annex V to MARPOL 73/78 as amended by IMO resolution MEPC.277(70), and declared by the shipper as to whether or not they are harmful to the marine environment.

## **8 GARBAGE MANAGEMENT PLAN**

In compliance with regulation 10 of the revised Annex V to MARPOL 73/78, every ship of 100 gross tonnage and above, and every ship certified to carry 15 or more persons, and every fixed platform or floating facility engaged in exploration, exploitation and associated offshore processing of seabed mineral resources, are required to carry and implement a Garbage Management Plan, which shall be developed in compliance with the 2012 Guidelines for the Development of Garbage Management Plans (IMO resolution MEPC.220(63)).

Although the approval of the Garbage Management Plans is not required by Annex V to MARPOL 73/78, they may be approved on behalf of the Administrations, which authorized the Register appropriately.

According to the Letter of the Federal Maritime Administration of Russia No. МФ-36/2481 dated 22.10.1996, Russian Maritime Register of Shipping is authorized to approve the Garbage Management Plans for the ships flying the RF flag.

## **INSTRUCTIONS ON SURVEY OF SHIPS FOR COMPLIANCE WITH THE NORMATIVE DOCUMENTS REQUIREMENTS FOR THE PREVENTION OF AIR POLLUTION FROM SHIPS BY OZONE DEPLETING SUBSTANCES**

### **1 SCOPE OF APPLICATION**

The Instructions on Survey of Ships for Compliance with the Normative Documents Requirements for the Prevention of Air Pollution from Ships by Ozone Depleting Substances (hereinafter referred to as "the Instructions") have been developed based on the requirements of regulation 12 in Annex VI to MARPOL 73/78, provisions the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987 (hereinafter referred to as "the Montreal Protocol"), as well as IMO resolution A.719(17) and the RS Rules in relation to ozone depleting substances (ODS).

### **2 DEFINITIONS AND EXPLANATIONS**

For the purpose of this Appendix the definitions and explanations given in 1.2.1, Part VI "Ship's Equipment and Arrangements for the Prevention of Air Pollution" of these Guidelines shall be used.

### **3 DESCRIPTION OF OZONE DEPLETING SUBSTANCES**

The following substances refer to ODS listed in Annexes A, B, C or E to the Montreal Protocol: chlorofluorocarbons (CFCs) — substances consisting of chlorine, fluorine and carbon; hydro-chlorofluorocarbons (HCFCs) — substances consisting of hydrogen, chlorine, fluorine and carbon; halons — substances consisting of methyl bromide, carbon tetrachloride, methyl chloroform.

In accordance with the Montreal Protocol, a number of widely used refrigerants — halogen derivatives of CFC group, among which are refrigerants (freons) R12, R502 and some others, as well as the relevant refrigerating equipment shall be excluded from the production and operational practices.

### **4 APPLICATION OF THE OZONE DEPLETING SUBSTANCES**

The following substances are applied in the refrigerating engineering:

R12, R502 relating to CFC and included into group I of Annex A to the Montreal Protocol;

R22 relating to HCFC and included into group I of Annex C to the Montreal Protocol;

R134A (tetrafluoroethane) and R717 (ammonia) not containing atoms of chlorine and bromine, of which the ozone depleting potential (ODP) is equal to 0 and does not fall within the Montreal Protocol.

Fire extinguishing systems make use of halons 1301 and 2402 included into group II of Annex A to the Montreal Protocol. As an alternative to halons the following substances, which are not ozone depleting substances, may be used in fire extinguishing systems: Novec 1230 (C-6), HFC-125, HFC-227ca and the others.

### **5 REQUIREMENTS FOR CONTROL OF EMISSIONS FROM SHIPS**

#### **5.1 Requirements of Regulation 12 of Annex VI to MARPOL 73/78**

Subject to the provisions of regulation 12 in Annex VI to MARPOL 73/78, shipboard systems and equipment that contain ODSs, other than HCFCs, shall be prohibited when installed on ships as specified in 2.1.2.1, Part VI "Ship's Equipment and Arrangements for the Prevention of Air Pollution" of these Guidelines.

Shipboard systems and equipment that contain HCFC shall be prohibited when installed on ships as specified in 2.1.2.2, Part VI "Ship's Equipment and Arrangements for the Prevention of Air Pollution" of these Guidelines.

Any deliberate emissions of ozone depleting substances occurring in the course of operations for recharging (maintaining), servicing and repairing of shipboard installations shall be prohibited (except the operations to secure the safety of ship and life at sea, as well as in the event of damage to the ship). Deliberate emissions do not include minimal releases associated with the recapture or recycling of an ozone depleting substance.

Ozone depleting substances which may be found on board ship include, but are not limited to the following substances: refrigerants R11, R12, R113, R114, R115, as well as halons 1211, 1301; 2402 (also known as halon 114B2).

## **5.2 Requirements of other normative documents**

### **5.2.1 Requirements of IMO resolution A.719(17) "Prevention of Air Pollution from Ships".**

According to IMO resolution A.719(17), the use of CFC whose ODP is higher than 5 % of ODP of R11 (taken as 1) in installations of fixed refrigeration and air conditioning plants shall be prohibited on ships of which the keel is laid or which are at a similar stage of construction on or after 6 November 1992. The use of CFC in such new installations on other ships shall be prohibited by 6 November 1992.

The use of halons in installations of fire extinguishing systems on board ships except those falling in the category of "essential use" shall be prohibited on ships of which the keel is laid or which are at a similar stage of construction on or after 1 July 1992. The use of halons in such new installations on other ships shall be prohibited by 1 January 1992.

### **5.2.2 Requirements of the Rules for the Classification and Construction of Sea-Going Ships, 2015.**

In accordance with 2.2.1, Part XII "Refrigerating Plants" of the Rules for the Classification and Construction of Sea-Going Ships, the use of refrigerants other than those given in Table 2.2.1 (i.a. other than freons R22 and R134A) is subject to special consideration by the Register with regard to their toxicity, inflammability and explosiveness.

In accordance with 3.1.1.4, Part VI "Fire Protection", it is prohibited to install in ships new fire extinguishing plants utilizing halon 1211, halon 1301 halon 2402.

## **6 SURVEY OF SHIPS**

During survey of ships for compliance with the requirements of regulation 12 in Annex VI to MARPOL 73/78 the following is required (refer to Supplement 2 to this Appendix).

### **6.1 Halons**

During survey, it shall be confirmed the operation of which shipboard fire extinguishing systems and fire-fighting equipment containing halons may be continued, and that they are in a condition suitable for their safe use.

Based on Section 5, the operation of fire extinguishing systems and fire-fighting equipment may be continued, in case they are installed on ships of which the keel is laid before 1 July 1992.

When the IAPP Certificate (form 2.4.6) is issued to a ship, a relevant entry shall be made in para 2.1.1 of the Supplement (form 2.4.23) to this Certificate, listing all shipboard fire extinguishing systems and fire-fighting equipment containing halons, the operation of which may be continued with indication of the systems and equipment type, halons used and location of systems and equipment.

### **6.2 Chlorofluorocarbons (CFC)**

During survey, it shall be confirmed the operation of which shipboard fire extinguishing systems and fire-fighting equipment containing CFC may be continued, and that they are in a condition suitable for their safe use.

Based on Section 5, the operation of any shipboard fire extinguishing systems and fire-fighting equipment containing CFC may be continued, in case they are installed on ships of which the keel is laid before 19 May 2005, except for systems and equipment containing CFC whose ODP is higher than 5 %

of ODP of R11 (taken as 1), the operation of which may be continued in case they are installed on ships of which the keel is laid before 6 November 1992.

When the IAPP Certificate (form 2.4.6) is issued to a ship, a relevant entry shall be made in para 2.1.1 of the Supplement (form 2.4.23) to this Certificate, listing all shipboard fire extinguishing systems and fire-fighting equipment containing CFC, the operation of which may be continued with indication of the systems and equipment type, CFC used and location of systems and equipment on ship.

### **6.3 Hydro-chlorofluorocarbons (HCFC)**

During survey, it shall be confirmed the operation of which shipboard fire extinguishing systems and fire-fighting equipment containing HCFC may be continued, and that they are in a condition suitable for their safe use.

Based on Section 5, the operation of any shipboard fire extinguishing systems and fire-fighting equipment containing HCFC may be continued, in case they are installed on ships of which the keel is laid before 1 January 2020.

When the IAPP Certificate (form 2.4.6) is issued to a ship, a relevant entry shall be made in para 2.1.2 of the Supplement (form 2.4.23) to this Certificate, listing all shipboard fire extinguishing systems and fire-fighting equipment containing HCFC, the operation of which may be continued with indication of the systems and equipment type, HCFC used and location of systems and equipment on ship.

### **6.4 Documentation subject to verification at periodical surveys of a ship**

The following documentation pursuant to regulation 6.1 of Annex VI to MARPOL 73/78 shall be kept on board and be available at periodical surveys of the ship, as well as at PSC inspections:

IAPP Certificate (form 2.4.6) with a Supplement (form 2.4.23);

ozone depleting substances record book on board each ship that has rechargeable systems that contain ozone depleting substances.

## SECTION 2.1 THE MONTREAL PROTOCOL

## Annex A: Controlled substances

Group	Substance	Ozone-Depleting Potential (ODP)*
<i>Group I</i>		
CFCl <sub>3</sub>	(CFC-11)	1,0
CF <sub>2</sub> Cl <sub>2</sub>	(CFC-12)	1,0
C <sub>2</sub> F <sub>3</sub> Cl <sub>3</sub>	(CFC-113)	0,8
C <sub>2</sub> F <sub>4</sub> Cl <sub>2</sub>	(CFC-114)	1,0
C <sub>2</sub> F <sub>5</sub> Cl	(CFC-115)	0,6
<i>Group II</i>		
CF <sub>2</sub> BrCl	(halon-1211)	3,0
CF <sub>3</sub> Br	(halon-1301)	10,0
C <sub>2</sub> F <sub>4</sub> Br <sub>2</sub>	(halon-2402)	6,0
*These ODPs are estimates based on existing knowledge and will be reviewed and revised periodically.		

## Annex B: Controlled substances

Group	Substance	Ozone-Depleting Potential (ODP)*
<i>Group I</i>		
CF <sub>3</sub> Cl	(CFC-13)	1,0
C <sub>2</sub> FCl <sub>5</sub>	(CFC-111)	1,0
C <sub>2</sub> F <sub>2</sub> Cl <sub>4</sub>	(CFC-112)	1,0
C <sub>3</sub> FCl <sub>7</sub>	(CFC-211)	1,0
C <sub>3</sub> F <sub>2</sub> Cl <sub>6</sub>	(CFC-212)	1,0
C <sub>3</sub> F <sub>3</sub> Cl <sub>5</sub>	(CFC-213)	1,0
C <sub>3</sub> F <sub>4</sub> Cl <sub>4</sub>	(CFC-214)	1,0
C <sub>3</sub> F <sub>5</sub> Cl <sub>3</sub>	(CFC-215)	1,0
C <sub>3</sub> F <sub>6</sub> Cl <sub>2</sub>	(CFC-216)	1,0
C <sub>3</sub> F <sub>7</sub> Cl	(CFC-217)	1,0
<i>Group II</i>		
CCl <sub>4</sub>	carbon tetrachloride	1,1
<i>Group III</i>		
C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub> *	1,1,1-trichloroethane* (methyl chloroform)	0,1
*This formula does not refer to 1,1,2-trichloroethane.		

## Annex C: Controlled substances

Group	Substance	Number of isomers Ozone-Depleting	Potential (ODP)*
<i>Group I</i>			
CHFCl <sub>2</sub>	(HCFC-21)**	1	0,04
CHF <sub>2</sub> Cl	(HCFC-22)**	1	0,055
CH <sub>2</sub> FCl	(HCFC-31)	1	0,02
C <sub>2</sub> HFCl <sub>4</sub>	(HCFC-121)	2	0,01-0,04
C <sub>2</sub> HF <sub>2</sub> Cl <sub>3</sub>	(HCFC-122)	3	0,02-0,08
C <sub>2</sub> HF <sub>3</sub> Cl <sub>2</sub>	(HCFC-123)	3	0,02-0,06
CHCl <sub>2</sub> CF <sub>3</sub>	(HCFC-123)**		0,02
C <sub>2</sub> HF <sub>4</sub> Cl	(HCFC-124)	2	0,02-0,04
CHFClCF <sub>3</sub>	(HCFC-124)**	-	0,022
C <sub>2</sub> H <sub>2</sub> FCl <sub>3</sub>	(HCFC-131)	3	0,007-0,05
C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> Cl <sub>2</sub>	(HCFC-132)	4	0,008-0,05
C <sub>2</sub> H <sub>2</sub> F <sub>3</sub> Cl	(HCFC-133)	3	0,02-0,06
C <sub>2</sub> H <sub>3</sub> FCl <sub>2</sub>	(HCFC-141)	3	0,005-0,07
CH <sub>3</sub> CFCl <sub>2</sub>	(HCFC-141b)**		0,11
C <sub>2</sub> H <sub>3</sub> F <sub>2</sub> Cl	(HCFC-142)	3	0,008-0,07
CH <sub>3</sub> CF <sub>2</sub> Cl	(HCFC-142b)**		0,065
C <sub>2</sub> H <sub>4</sub> FCl	(HCFC-151)	2	0,003-0,005

Continued

Group	Substance	Number of isomers Ozone-Depleting	Potential (ODP)*
C <sub>3</sub> HFCl <sub>6</sub>	(HCFC-221)	5	0,015-0,07
C <sub>3</sub> HF <sub>2</sub> Cl <sub>5</sub>	(HCFC-222)	9	0,01-0,09
C <sub>3</sub> HF <sub>3</sub> Cl <sub>4</sub>	(HCFC-223)	12	0,01-0,08
C <sub>3</sub> HF <sub>4</sub> Cl <sub>3</sub>	(HCFC-224)	12	0,01-0,09
C <sub>3</sub> HF <sub>5</sub> Cl <sub>2</sub>	(HCFC-225)	9	0,02-0,07
CF <sub>3</sub> CF <sub>2</sub> CHCl <sub>2</sub>	(HCFC-225ca)**		0,025
CF <sub>2</sub> ClCF <sub>2</sub> CHClF	(HCFC-225cb)**		0,033
C <sub>3</sub> HF <sub>6</sub> Cl	(HCFC-226)	5	0,02-0,10
C <sub>3</sub> H <sub>2</sub> FCl <sub>5</sub>	(HCFC-231)	9	0,05-0,09
C <sub>3</sub> H <sub>2</sub> F <sub>2</sub> Cl <sub>4</sub>	(HCFC-232)	16	0,008-0,10
C <sub>3</sub> H <sub>2</sub> F <sub>3</sub> Cl <sub>3</sub>	(HCFC-233)	18	0,007-0,23
C <sub>3</sub> H <sub>2</sub> F <sub>4</sub> Cl <sub>2</sub>	(HCFC-234)	16	0,01-0,28
C <sub>3</sub> H <sub>2</sub> F <sub>5</sub> Cl	(HCFC-235)	9	0,03-0,52
C <sub>3</sub> H <sub>3</sub> FCl <sub>4</sub>	(HCFC-241)	12	0,004-0,09
C <sub>3</sub> H <sub>3</sub> F <sub>2</sub> Cl <sub>3</sub>	(HCFC-242)	18	0,005-0,13
C <sub>3</sub> H <sub>3</sub> F <sub>3</sub> Cl <sub>2</sub>	(HCFC-243)	18	0,007-0,12
C <sub>3</sub> H <sub>3</sub> F <sub>4</sub> Cl	(HCFC-244)	12	0,009-0,14
C <sub>3</sub> H <sub>4</sub> FCl <sub>3</sub>	(HCFC-251)	12	0,001-0,01
C <sub>3</sub> H <sub>4</sub> F <sub>2</sub> Cl <sub>2</sub>	(HCFC-252)	16	0,005-0,04
C <sub>3</sub> H <sub>4</sub> F <sub>3</sub> Cl	(HCFC-253)	12	0,003-0,03
C <sub>3</sub> H <sub>5</sub> FCl <sub>2</sub>	(HCFC-261)	9	0,002-0,02
C <sub>3</sub> H <sub>5</sub> F <sub>2</sub> Cl	(HCFC-262)	9	0,002-0,02
C <sub>3</sub> H <sub>6</sub> FCl	(HCFC-271)	5	0,001-0,03
<i>Group II</i>			
CHFBr <sub>2</sub>		1	1,00
CHF <sub>2</sub> Br	(HBFC-22B1)	1	0,74
CH <sub>2</sub> FBr		1	0,73
C <sub>2</sub> HFBr <sub>4</sub>		2	0,3-0,8
C <sub>2</sub> HF <sub>2</sub> Br <sub>3</sub>		3	0,5-1,8
C <sub>2</sub> HF <sub>3</sub> Br <sub>2</sub>		3	0,4-1,6
C <sub>2</sub> HF <sub>4</sub> Br		2	0,7-1,2
C <sub>2</sub> H <sub>2</sub> FBr <sub>3</sub>		3	0,1-1,1
C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> Br <sub>2</sub>		4	0,2-1,5
C <sub>2</sub> H <sub>2</sub> F <sub>3</sub> Br		3	0,7-1,6
C <sub>2</sub> H <sub>3</sub> FBr <sub>2</sub>		3	0,1-1,7
C <sub>2</sub> H <sub>3</sub> F <sub>2</sub> Br		3	0,2-1,1
C <sub>2</sub> H <sub>4</sub> FBr		2	0,07-0,1
C <sub>3</sub> HFBr <sub>6</sub>		5	0,3-1,5
C <sub>3</sub> HF <sub>2</sub> Br <sub>5</sub>		9	0,2-1,9
C <sub>3</sub> HF <sub>3</sub> Br <sub>4</sub>		12	0,3-1,8
C <sub>3</sub> HF <sub>4</sub> Br <sub>3</sub>		12	0,5-2,2
C <sub>3</sub> HF <sub>5</sub> Br <sub>2</sub>		9	0,9-2,0
C <sub>3</sub> HF <sub>6</sub> Br		5	0,7-3,3
C <sub>3</sub> H <sub>2</sub> FBr <sub>5</sub>		9	0,1-1,9
C <sub>3</sub> H <sub>2</sub> F <sub>2</sub> Br <sub>4</sub>		16	0,2-2,1
C <sub>3</sub> H <sub>2</sub> P <sub>3</sub> Br <sub>3</sub>		18	0,2-5,6
C <sub>3</sub> H <sub>2</sub> F <sub>4</sub> Br <sub>2</sub>		16	0,3-7,5
C <sub>3</sub> H <sub>2</sub> F <sub>5</sub> Br		8	0,9-14,0
C <sub>3</sub> H <sub>3</sub> FBr <sub>4</sub>		12	0,08-1,9
C <sub>3</sub> H <sub>3</sub> P <sub>2</sub> Br <sub>3</sub>		18	0,1-3,1
C <sub>3</sub> H <sub>3</sub> P <sub>3</sub> Br <sub>3</sub>		18	0,1-2,5
C <sub>3</sub> H <sub>3</sub> P <sub>4</sub> Br <sub>3</sub>		12	0,3-4,4
C <sub>3</sub> H <sub>4</sub> FBr <sub>3</sub>		12	0,03-0,3
C <sub>3</sub> H <sub>4</sub> F <sub>2</sub> Br <sub>2</sub>		16	0,1-1,0
C <sub>3</sub> H <sub>4</sub> F <sub>3</sub> Br		12	0,07-0,8
C <sub>3</sub> H <sub>5</sub> FBr <sub>2</sub>		9	0,04-0,4
C <sub>3</sub> H <sub>5</sub> F <sub>2</sub> Br		9	0,07-0,8
C <sub>3</sub> H <sub>6</sub> FBr		5	0,02-0,7
<i>Group III</i>			
CH <sub>2</sub> BrCl	bromochlorometh	1	0,12

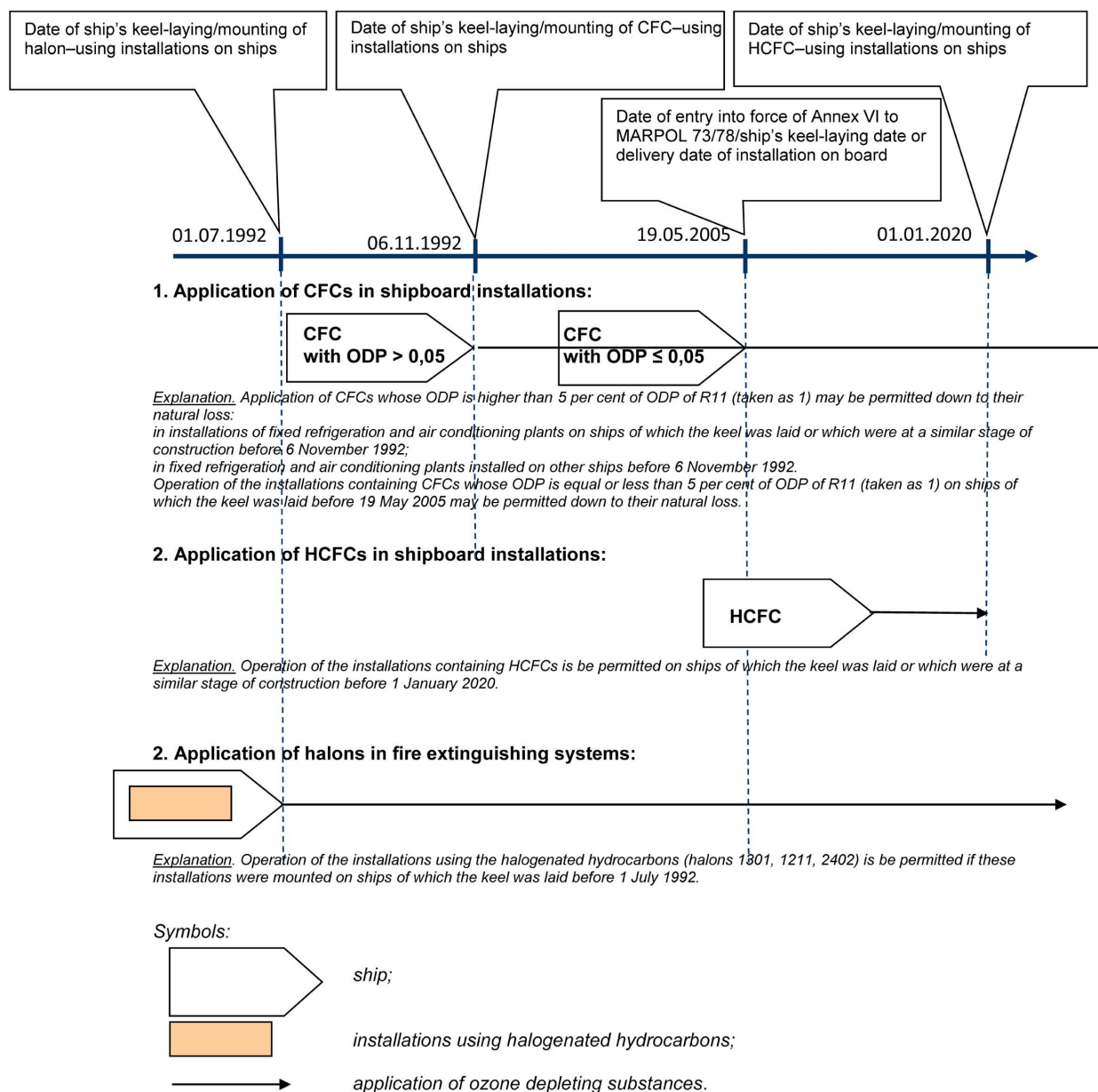
\*Where a range of ODPs is indicated, the highest value in that range shall be used for the purposes of the Protocol. The ODPs listed as a single value have been determined from calculations based on laboratory measurements. Those listed as a range are based on estimates and are less certain. The range pertains to an isomeric group. The upper value is the estimate of the ODP of the isomer with the highest ODP, and the lower value is the estimate of the ODP of the isomer with the lowest ODP.

\*\*Identifies the most commercially viable substances with ODP values listed against them to be used for the purposes of the Protocol.

**Annex E: Controlled substances**

Group	Substance	Ozone-Depleting Potential (ODP)
CH <sub>3</sub> Br	methyl bromide	0,06

### DIAGRAM OF APPLICATION OF OZONE DEPLETING SUBSTANCES ON THE SHIPS





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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