

TÜRK LOYDU



Chapter 76 – Environmental Service System

July 2019

This latest edition incorporates all rule changes. The latest revisions are shown with a vertical line. The section title is framed if the section is revised completely. Changes after the publication of the rule are written in red colour.

Unless otherwise specified, these Rules apply to ships for which the date of contract for construction as defined in IACS PR 29 is on or after 1st of July 2019. New rules or amendments entering into force after the date of contract for construction are to be applied if required by those rules. See Rule Change Notices on TL website for details.

"General Terms and Conditions" of the respective latest edition will be applicable (see Rules for Classification and Surveys).

If there is a difference between the rules in English and in Turkish, the rule in English is to be considered as valid. This publication is available in print and electronic pdf version. Once downloaded, this document will become UNCONTROLLED. Please check the website below for the valid version.

<http://www.turkloydu.org>

All rights are reserved by Türk Loydu, and content may not be reproduced, disseminated, published, or transferred in any form or by any means, except with the prior written permission of **TL**.

TÜRK LOYDU

Head Office Postane Mah. Tersaneler Cad. No:26 Tuzla 34944 İSTANBUL / TÜRKİYE

Tel : (90-216) 581 37 00

Fax : (90-216) 581 38 00

E-mail : info@turkloydu.org

<http://www.turkloydu.org>

Regional Offices

Ankara Eskişehir Yolu Mustafa Kemal Mah. 2159. Sokak No : 6/4 Çankaya - ANKARA / TÜRKİYE

Tel : (90-312) 219 56 34

Fax : (90-312) 219 68 25

E-mail : ankara@turkloydu.org

İzmir Atatürk Cad. No :378 K.4 D.402 Kavalalılar Apt. 35220 Alsancak - İZMİR / TÜRKİYE

Tel : (90-232) 464 29 88

Fax : (90-232) 464 87 51

E-mail : izmir@turkloydu.org

Adana Çınarlı Mah. Atatürk Cad. Aziz Naci İş Merkezi No:5 K.1 D.2 Seyhan - ADANA / TÜRKİYE

Tel : (90- 322) 363 30 12

Fax : (90- 322) 363 30 19

E-mail : adana@turkloydu.org

Environmental Service System

	Page
Section 1 – General Information	
A. General.....	1- 2
B. Applicable Regulations, Rules and Guidelines.....	1- 3
Section 2 – Environmental Passport	
A. General	2- 2
B. Emissions into the Sea.....	2- 2
C. Emissions into the Air.....	2- 4
D. Ship Recycling	2- 8
E. Voluntary Participation in TL Energy Efficiency Operational Indicator (EEOI) Monitoring	2- 8
F. Certification of Additional Environmental Protection Properties	2- 8

SECTION 1

GENERAL INFORMATION

	Page
A. GENERAL	1- 2
1. Scope and Application	
2. Environmental Passport	
B APPLICABLE REGULATIONS, RULES AND GUIDELINES.....	1- 3
1. Basic Requirements	
2. Documents	
3. Operational Procedures	
4. Additional Plans and Informations	
5. Surveys and Audits	
6. Terms and Abbreviations	

Introduction

The main element of the Environmental Service System is the Environmental Passport, which on request by the customer can be supplemented by individual services, such as advice on special requirements applying in the range of trade as well as the certification of special environmental protection properties of the ship. This Guideline pursues the objective of reducing the noxious interactions between the ship and the environment through well-founded assessment and certification of technical environmental processes and installations beyond the scope of internationally mandatory standards. The aim in each case is to reduce the environmental impact of sea shipping beyond the requirements of the relevant mandatory regulations by setting moderate additional requirements. Examples here include voluntary early compliance with the IMO regulations still undergoing the ratification process as well as limitations to the use of climate-damaging substances.

A prerequisite for certification of the special environmental protection properties is that the following requirements can be met:

- *The properties can be achieved by means of commercially available processes and equipment offering high quality and reliability.*
- *For the purposes of verification, there are already technical standards available that are highly likely to come into effect internationally.*

From the systematic analysis of developments in environmental protection and legislature, Türk Loydu continuously derives new requirements for the Environmental Passport, and these are documented and updated in regularly revised guidelines.

A. General

1. Scope and Application

These Guidelines shall apply to all ships for which the Environmental Passport is ordered on or after 1 August 2011.

2. Environmental Passport

2.1 On meeting the technical requirements set out in Section 2, the ship is issued with the Environmental Passport. This comprises the "Environmental Passport" certificate, together with certificates issued by the flag state and certificates, statements of compliance and test certificates issued by **TL** or by other recognized classification societies.

2.1.1 For new buildings, an "Interim Environmental Passport" with a validity period of 5 months is issued by the competent **TL** Inspection Office.

2.2 On request, **TL** will also examine and document in the Environmental Passport other additional environmental protection properties of the ship exceeding the requirements in Section 2, B. - D.; see Section 2, F.

2.2.1 Within the scope of the **TL** Environmental Service System, the enquirer (owner, yard, product and system suppliers) are given comprehensive advice and support. In close consultation, the type and scope of the environmental protection properties are defined, suitable verification procedures are selected, and the test and certification procedures are established.

2.3 Ships with **TL** class are issued the Class Notation **EP**.

2.4 The Environmental Passport and the corresponding Class Notation are valid within the ongoing class period but for max. 5 years from the day of issue. In case of EP renewal for a further class period the duration of EP validity and class period are identical.

2.5 In the event that certain parts of the Environmental Passport lose their validity, the latter will become invalid as a whole and the corresponding class notation will be retracted. If the necessary surveys and certifications are obtained subsequently, the validity of the Environmental Passport and the class notation will be reinstated within the scope of their original validity period.

B. Applicable Regulations, Rules and Guidelines

1. Basic requirements

All basic requirements to be fulfilled will rest upon on internationally recognized regulations. A minimum set is defined by the following requirements, insofar relevant for the ship:

MARPOL 73/78 Annex I-VI

- Annex I, "Regulations for the Prevention of Pollution by Oil",
- Annex II, "Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk",
- Annex III, "Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packed Form",
- Annex IV, "Regulations for the Prevention of Pollution by Sewage from ships",
- Annex V, "Regulations for the Prevention of Pollution by Garbage from Ships",
- Annex VI, "Regulations for the Prevention of Air Pollution from Ships".

SOLAS 74/88 as amended

- Chapter VII "Carriage of dangerous goods",

"International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001",

"International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004",

MEPC.269(68), "2015 Guidelines for the Development of the Inventory of Hazardous Materials",

MEPC.245(66) as amended by MEPC 263(68) and MEPC 281(70), 2014 Guidelines on the Method of Calculation of the Attained Energy Efficiency Design Index (EEDI) for New Ships,

MEPC.254(67) as amended by MEPC 261(68), 2014 Guidelines on survey and certification of the Energy Efficiency Design Index (EEDI)

MEPC 282(70), 2016 Guidelines for the Development of a Ship Energy Efficiency Management Plan (SEEMP)

Directive 2005/33/EC of the European Parliament and of the Council.

2. Documents

Equivalent information shall be submitted to TL if the following documents are not issued by TL:

- All mandatory certificates according to **MARPOL 73/78** and Annexes as amended
- Documentation verifying compliance with **MARPOL 73/78 Annexes**, as applicable
- List of environmentally relevant equipment, and corresponding documents not covered by **MARPOL 73/78**
- Measurement and assessment reports and documentation issued by authorities and by recognized or accredited bodies

3. Operational Procedures

The following operational procedures shall be submitted, as applicable:

- Vapour emission control system,
- VOC Management Plan,
- Plans for preventive measures, such as selective catalytic reduction (SCR),

- Fuel oil management (SOx/NOx emission control),
- Arrangement plan and refrigerant piping diagram for Provision cooling, AC plant and, if so, fixed installed cargo refrigeration plant,
- Ballast water management plan,
- Ballast water treatment plan,
- Garbage management plan.

4. Additional plans and information

The following additional plans shall be submitted, if applicable:

- Details of the fuel oil system
- Details of the ballast tank arrangement and ballast system
- Details of the refrigeration system
- Details of the fire fighting system
- Details of the incinerator system
- Details of the sewage system
- Details of the garbage management system

5. Surveys and Audits

The technical surveys and audits shall be performed according to the specific requirements of each certification.

6. Terms and Abbreviations

CFC means chlorofluorocarbon.

ECA means Emission Control Area.

EEDI means Energy Efficiency Design Index

EEDI Certificate means Energy Efficiency Design Index Certificate

Emission means any release of substances from ships subject to control by these Guidelines into the atmosphere or sea.

FPSO means floating production, storage and offloading vessel

GWP means global warming potential, and is the ratio of the warming caused by a certain substance to the warming caused by the corresponding mass of carbon dioxide (the GWP of CO₂ is defined to be 1.0). All GWP values are calculated over a 100-year time horizon.

HCFC means hydrochlorofluorocarbon.

IACS means the International Association of Classification Societies.

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

IGC Code means the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk.

IHM Inventory of Hazardous Materials

IMO means International Maritime Organization.

IMDG Code means International Maritime Dangerous Goods Code.

MARPOL 73/78 means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, including the Annexes I to VI.

MEPC means the Marine Environment Protection Committee of IMO.

Montreal Protocol means "The Montreal Protocol on Substances that Deplete the Ozone Layer", 1987, and the respective adjustments/amendments 1990 to 1999.

MSC means the Maritime Safety Committee of IMO.

NH₃ means ammonia.

NO_x means nitrogen oxides.

NO_x Technical Code means the Technical Code on Control of Emissions of Nitrogen Oxides from Marine Diesel Engines, adopted by Resolution 2 of the 1997 MARPOL Conference, -respectively- the valid edition of the Code.

SCR means selective catalytic reduction (of NO_x).

SO_x means sulphur oxides.

TBT means tributyltin.

VOC means volatile organic compounds.

SECTION 2

ENVIRONMENTAL PASSPORT

	Page
A. GENERAL	2- 2
B. EMISSIONS INTO THE SEA	2- 2
1. Oil and oily mixtures	
2. Bilge Water	
3. Noxious and/or Dangerous Cargoes	
4. Sewage	
5. Ballast Water	
6. Anti-Fouling Systems	
7. Garbage	
C. EMISSIONS INTO THE AIR	2- 4
1. NOx Emissions from Marine Diesel Engines	
2. SOx Emissions from Diesel Engines	
3. Vapour Emission Control Systems	
4. Shipboard Incineration	
5. Refrigeration Systems	
6. Fire Fighting	
7. Energy Efficiency	
D. SHIP RECYCLING	2- 8
1. General	
2. Scope of Application	
3. Statement of Compliance	
E. VOLUNTARY PARTICIPATION IN TL ENERGY EFFICIENCY OPERATIONAL INDICATOR (EEOI)	
MONITORING	2- 8
1. General	
2. Scope of Application	
3. EEOI Certificate	
F. CERTIFICATION OF ADDITIONAL ENVIRONMENTAL PROTECTION PROPERTIES	2- 8

A. General

The technical requirements in this Section control the operational and environmentally relevant discharges and emissions:

a) Into the sea of:

- Oil and oily mixtures
- Noxious and/or dangerous cargoes
- Sewage
- Garbage
- Ballast water
- Biocides from anti-fouling coatings

b) Into the air of:

- CO₂ emissions
- Ozone depleting substances in refrigerants and fire extinguishing media
- Volatile organic compounds
- SO_x emissions
- NO_x emissions
- Flue gases of incineration plants.

c) Additional requirements:

- Inventory of Hazardous Materials

B. Emissions into the Sea**1. Oil and oily mixtures****1.1 Application**

The requirements according to Annex I of **MARPOL 73/78**, Regulations for the Prevention of Pollution by Oil, apply to all ships.

1.2 Discharge of oil and oily mixtures

Discharge of oil and oily mixtures from ships into the sea is prohibited unless relevant conditions of Annex I of **MARPOL 73/78** permits discharge

Discharge of oily mixtures from the cargo area of oil tankers should be in compliance with Annex I of **MARPOL 73/78**, regulation 34.

1.3 Oil record books

Oil record books shall be provided in a form according to Appendix III to Annex I of **MARPOL 73/78**.

2. Bilge Water**2.1 Scope of application**

2.1.1 The requirements of **MARPOL 73/78**, Annex I, apply to all ships.

2.1.2 IMO Resolution MEPC.107(49) as amended by MEPC 285(70), Guidelines and Specifications for Pollution Prevention Equipment for Machinery Space Bilges of Ships, applies to all ships.

2.1.3 The following requirements are applicable to oily water removed from the machinery space bilges of any ship.

2.1.4 Within the scope of EP Notation, installation of IBTS (Integrated Bilge Water Treatment System) is made compulsory and statement of fact shall be issued for compliance with Guidance Notes set in MEPC.1/Circular.642 as amended by MEPC.1/Circ.676 and MEPC.1/Circ.760 Appendix 1.

2.2 Discharge of bilge water

2.2.1 The discharge of oily bilge water is prohibited, unless the oil content does not exceed 15 ppm.

2.2.2 All ships shall be equipped with:

- 15 ppm bilge water separator
- 15 ppm monitor and alarm

- Automatic stopping device

in accordance with the requirements for the equipment as detailed in the **TL** Rules for Machinery Installations Part B, Chapter 4, Section 16, O.1.

2.2.3 The piping and pumping arrangements of the 15 ppm bilge water separator shall be independent of all other piping systems.

2.3 Holding tanks

Holding tank capacity of sufficient size shall be provided for the delivery of bilge water to shore.

3. Noxious and/or Dangerous Cargoes

For the transportation of noxious and/or dangerous cargoes, the applicable requirements of Annex II and Annex III of **MARPOL 73/78**, the IGC Code, the IBC Code and the IMDG Code shall be met.

Fulfilment of these demands shall be demonstrated by the following certificates, depending on the ship type and the kind of cargo:

- International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk
- International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk
- International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk

4. Sewage

4.1 All requirements according to Annex IV of **MARPOL 73/78**, Regulations for the Prevention of Pollution by Sewage, apply to all ships. Compliance shall be verified with the International Sewage Pollution Prevention Certificate.

4.2 An initial survey as well as renewal surveys are required in accordance with the provisions of Regulation 4 of Annex IV of **MARPOL 73/78**.

4.3 Discharge of sewage into the sea is prohibited unless any of the conditions of Regulation 3 or Regulation 11 of Annex IV of **MARPOL 73/78** is applicable.

4.4 Standard dimensions of connections for shore discharge shall be in accordance with the data given in Regulation 10 of Annex IV of **MARPOL 73/78**.

4.5 All means of grey water treatment and the capacity of holding tanks on board shall be documented.

4.6 The Sewage Treatment Plant has to be examined and satisfactorily tested in accordance with the International Maritime Organization Resolution MEPC.227(64) as amended by MEPC 284(70) to meet the operational requirements referred to in Regulation 9.1.1 or 9.2.1 of Annex IV of the International Convention for the Prevention of Pollution from Ships, 1973/78 as modified by Resolution MEPC.200(62).

5. Ballast Water

5.1 General requirements

All requirements according to International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention), apply to all ships. Compliance shall be verified with the International Ballast Water Management Certificate.

5.2 Ballast water management

5.2.1 A ballast water management system (comprising tanks for ballast water and the associated piping, pumping and treatment system) shall be established to implement the treatment (or other method accepted as being equivalent).

5.2.2 A ship-specific ballast water management plan shall be drawn up in accordance with IMO Resolution A.868(20) or IMO MEPC Res. 127(53) as amended by MEPC 306(73) – Guidelines for ballast water management and the development of ballast water management plans (G4). See also **TL** Additional Rule "Installation of Ballast Water Management Systems".

5.2.3 The ballast water management plan shall be approved for compliance with the IMO resolutions mentioned in 5.2.2 and with other relevant requirements of the class by **TL**.

5.2.4 Treatment system

A ballast water treatment plant shall be installed. Ballast water treatment plants are to be approved by a flag administration acc. to IMO Resolution MEPC 300(72) and **TL** Rules for Machinery Installations Chapter 4, Section 16, P .1.6.

6. Anti-fouling Systems

6.1 Application of biocide free antifouling is recommended.

6.2 The anti-fouling systems used on ships shall not contain any organotin compounds which act as biocides.

6.3 The application, re-application, installation or use of harmful anti-fouling systems containing organotin compounds which act as biocides is prohibited from January 1st, 2003.

6.4 The certification of TBT-free anti-fouling systems on ships shall be in accordance with the "International Convention on the Control of Harmful Anti-Fouling Systems on Ships".

7. Garbage

7.1 Scope of application

The requirements of **MARPOL 73/78**, Annex V "Regulations for the Prevention of Pollution by Garbage from Ships" apply to all ships.

7.2 Garbage handling

7.2.1 A garbage management plan shall be established in accordance with Regulation 10 of Annex V of **MARPOL 73/78** and kept on board of all ships. This plan shall provide written procedures for the collecting, storing, processing and disposing of garbage, including the use of the equipment on board.

A person in charge of carrying out the plan has to be designated.

7.2.2 A garbage record book, comprising all relevant information of the discharge operations or completed incineration, shall be kept on board. All operations and each completed page shall be signed according to Regulation 10.3 of Annex V of **MARPOL 73/78** and the Appendix to Annex V.

7.2.3 Equipment shall be provided on board for sorting, minimizing and storing the garbage prior to discharge or incineration. The respective procedures for sorting, minimizing and storing shall be incorporated into the garbage management plan.

7.2.4 Every ship of 12 m or more in length overall shall display placards which notify the crew and passengers of the garbage disposal requirements of regulations 3 and 4 of Annex V of **MARPOL 73/78**.

7.2.5 Compliance with the above-mentioned requirements is confirmed by a "Certificate Concerning the Prevention of Pollution by Garbage", which is issued by **TL**.

C. Emissions into the Air

The requirements refer to Annex VI "Regulations for the Prevention of Air Pollution from Ships" of **MARPOL 73/78**.

These regulations shall not apply to:

- Emissions necessary for the purpose of securing the safety of a ship or saving life at sea, or
- Emissions resulting from damage to a ship or its equipment; see Annex VI, Regulation 3 of **MARPOL 73/78**.

1. NOx Emissions From Marine Diesel Engines

1.1 The requirements of **MARPOL Annex VI** Regulation 13 apply to diesel engines with a power output of more than 130 kW.

1.2 The requirements do not apply to marine diesel engines used solely for emergency purposes, such as diesel engines in lifeboats and emergency diesel engines.

1.3 The operation of a marine diesel engine exceeding the applicable limit is prohibited unless an exhaust gas cleaning system or any other equivalent method, as approved by **TL** in accordance with the NOx Technical Code and MEPC 291(71), is applied to the engine in order to reduce onboard NOx emissions to at least the limit specified in 1.3.

1.4 Testing, survey and certification of marine diesel engines to ensure compliance with the NOx emission limits of Regulation 13 shall be carried out according to the NOx Technical Code. In the event of compliance with all requirements, an "Engine International Air Pollution Prevention Certificate" (EIAPP) shall be issued in accordance with the form specified by Resolution MEPC.177(58).

1.5 Any alternative technical solution (SCR/EGR) according to MARPOL Annex VI, Regulation 4 for NOx reduction is permitted to provide the requirements of regulation 13 are fulfilled. In case of Exhaust Gas Recirculation (EGR) method is used, Resolution MEPC 307(73)* should be considered.

1.7 On request and on a voluntary basis, the average weighted NOx emission value can be calculated from on-board measurements, if practicable. The measurements shall be performed according to the requirements of the NOx Technical Code. The measurements shall be carried out by an accredited control laboratory that is competent in the field of emission measurements on internal combustion engines and boiler plants running on gaseous and liquid fuels (e.g. accredited under the terms of EN ISO/IEC 17025, as applicable). The results shall be presented in a measurement report.

(*) *The resolution should apply to a marine diesel engine fitted with an EGR device having a bleed-off water discharge arrangement, for which the EIAPP Certificate is first issued on or after 1 June 2019.*

1.8 The technical file of any marine diesel engine containing at least the information specified in section 2.4 of the NOx Technical Code shall be approved and kept on board. Emphasis shall be laid on the description of a practicable system of onboard NOx verification procedures which form the basis for periodical surveys.

2. SOx Emissions From Diesel Engines

2.1 The requirements refer to Revised **MARPOL 73/78** Annex VI, Regulation 14 as amended by Resolution MEPC.176(58) and apply to all ships.

2.2 The sulphur content of any fuel oil used on board ships in general shall not exceed

- 3.5 % of mass on and after 1 January 2012
- 0.5 % of mass on and after 1 January 2020

2.3 While ships are operating within an Emission Control Area, the sulphur content of fuel oil used on board ships shall not exceed

- 0.1 % of mass on and after 1 January 2015
- 0.1 % of mass on and after 1 January 2010 on EU ports at berth (Directive 2005/33/EC)

2.4 Exhaust gas cleaning systems may be used to reduce the emissions of SOx provided that the requirements of Resolution MEPC 259(68) 2015 Guidelines of Exhaust Gas Cleaning Systems are met.

2.5 Any alternative technical solution according to Annex VI, Regulation 4 for SOx reduction is permitted provided such technical solution is at least as effective in terms of emission reduction as required according to 2.2 and 2.3.

2.6 A fuel oil management system shall be installed to document:

- The maximum sulphur content of the fuel oil intended for combustion purposes as delivered to the ship, according to 2.2 and 2.3

- Representative fuel oil samples taken from the ship's bunker manifold
- Records of any purchase order.

2.7 Bunker delivery notes shall be kept on board and retained for at least three years. The samples of fuel oil shall be kept on board and retained for at least twelve months from the date of delivery.

3. Vapour Emission Control Systems

3.1 Scope of application

The requirements refer to all tankers intended for the transportation of volatile products in bulk, such as gasoline, other petroleum products, organic chemicals and crude oil.

The requirements are not applicable to terminals and to FPSOs (floating production, storage and offloading vessels).

3.2 Requirements for ship equipment

All tankers which are subject to vapour emission control shall be provided with a vapour emission collection and control system approved by **TL**. These tankers shall use such a system during the loading of the said cargoes.

3.3 The requirements of the Revised Annex VI, Regulation 15 and IMO "Standards for Vapour Emission Control Systems" (MSC/Circ.585) apply to all vapour emission collection and control systems installed on board.

4. Shipboard Incineration

4.1 The requirements of **MARPOL 73/78**, Annex VI, Regulation 16, apply to all shipboard incinerators and to their usage.

4.2 Type approval in accordance with IMO Resolution MEPC 244(66) is necessary for all incinerators installed on board.

4.3 The incineration of garbage shall be

documented in the garbage record book.

4.4 The incineration of oily residues and oily wastes shall be documented in the oil record book.

5. Refrigeration systems

5.1 Scope of application

5.1.1 The following requirements are applicable to refrigeration plants used for cargo refrigeration, gas reliquefaction, air conditioning, provision cooling and catering systems on all ships.

5.1.2 The requirements are not applicable to any stand-alone refrigeration or air conditioning systems, such as those found in galleys, pantries, bars, crew accommodation or technical spaces.

5.2 Refrigerants

5.2.1 Refrigeration systems shall be filled with environment friendly refrigerants. The use of natural refrigerants such as NH₃ CO₂ etc. is strongly recommended.

5.2.2 The use of ozone-depleting refrigerants is not allowed. Exception will be made to the HCFCs in existing ships until 1 January 2020.

The global warming potential (GWP) of any refrigerant used on board shall not exceed 3800.

5.2.3 Refrigeration systems shall be arranged with a suitable means of protection to prevent the release of any substantial quantity of the refrigerant.

5.3 Refrigerant monitoring

5.3.1 Periodic leak-detection procedures shall be established to minimize refrigerant leakage.

5.3.2 Consumption, disposal and leaks of refrigerants shall be documented. Documentation, e.g. by means of a log book, shall be kept available on board. For each system, the annual refrigerant leakage rate shall not exceed 10 % of its total charge.

5.3.3 A leak detection system appropriate for the type of refrigerant shall be provided to monitor continuously the refrigeration machinery spaces or installation areas of refrigerating machinery. An alarm shall be given when the refrigerant concentration exceeds a predetermined limit. The alarm shall be linked to the general machinery alarm system.

5.4 Refrigerant recovery

5.4.1 Maintenance, servicing and repair work shall be carried out without releasing any substantial quantity of refrigerant.

5.4.2 For the purpose of refrigerant recovery, at least one refrigerant compressor of each system shall be capable of evacuating the system into a liquid receiver or gas cylinders dedicated to this purpose. The capacity of the refrigerant receiver or the gas cylinders shall not be less than a full charge of the largest refrigerant system. Additionally, recovery units shall be provided to evacuate residual quantities from a refrigeration system either into the liquid receiver or into gas cylinders dedicated to this purpose. Recovery units may be permanently installed or of a mobile type.

6. Fire Fighting

6.1 Scope of application

The requirements apply to fixed fire extinguishing systems and to portable fire extinguishers.

6.2 Fire extinguishing media

6.2.1 Fire-fighting systems should be provided with environment friendly fire-fighting substances. The use of natural substances such as CO₂, argon, nitrogen, water etc. is recommended.

6.2.2 The use of halo-carbons (halons) as fire fighting substances is not permitted.

6.2.3 Alternative substances to halons are permitted, provided that they have a GWP of less than 4000.

6.3 Fire fighting systems and equipment

The requirements of IMO Resolution MSC.98(73), the International Code for Fire Safety Systems (FSS Code), apply to all ships.

7. Energy Efficiency

7.1 Greenhouse gases emitted by international shipping contributed 2.7 % to global CO₂ emissions in 2007, acc. to the 2nd IMO GHG Study, MEPC 59/INF10.

IMO developed the EEDI as a technical measure to successively improve a ship's efficiency. The index displays the theoretical CO₂ emission per cargo capacity and reference speed.

7.2 Scope of application

The requirements apply to all new ships as described in MEPC.245(66) as amended by MEPC 263(68) and MEPC 281(70), 2014 Guidelines on the Method of Calculation of the Attained Energy Efficiency Design Index (EEDI) for New Ships.

7.3 EEDI statement of compliance

Compliance with the above mentioned requirements is confirmed by the "EEDI Statement of Compliance", which is issued by TL.

7.4 Ship Energy Efficiency Management Plan (SEEMP)

All ships of 400 gt or above are required to have a Ship Energy Efficiency Management Plan (SEEMP) onboard, at initial survey according to Guidelines developed by the IMO (MEPC 282(70)).

In the case of a ship of 5,000 gross tonnage and above, the SEEMP shall include a description of the methodology that will be used to collect the data required by regulation 22A.1 of this Annex and the processes that will be used to report the data to the ship's Administration.

D. Ship Recycling

1. General

In 2009 the International Convention for the Safe and Environmentally Sound Recycling of ships ("Hong Kong Convention") was adopted. The aim of this convention is to improve the applied working practice regarding occupational safety and environmental protection related to ship recycling.

A significant requirement of the convention is the generation of the Inventory of Hazardous Materials (IHM) for all ships. The IHM lists hazardous materials on board of a ship.

2. Scope of Application

An Inventory of Hazardous Materials for all merchant ships is to be prepared based on "MEPC.269 (68) – Guidelines for the Development of the Inventory of Hazardous Materials"

3. Statement of Compliance

Compliance with the above mentioned requirements is confirmed by the "Statement of Compliance on Inventory of Hazardous Materials", which is issued by TL.

E. Voluntary Participation in TL Energy Efficiency Operational Indicator (EEOI) monitoring

1. General

As introduced in 7.1, IMO aims to increase ships efficiency also for ships in service. An operational measure is the Energy Efficiency Operational Indicator. The EEOI displays the effective CO2 emissions per unit of cargo transported and nautical mile sailed and is averaged over a certain period.

2. Scope of application

TL calculates the EEOI based on customer data on fuel oil consumption, cargo transported and sailing distances for an agreed ship operational time period (e.g. a year) and delivers the results back to the customer.

The required customer data are to be submitted to TL in a suitable format. TL carries out data pre-checks and, if necessary, clarifies outstanding questions. The verification is done by an customer office check.

3. EEOI Certificate

With the results from 2. TL issues the EEOI Certificate with a validity of 1 year based on "Guidelines for Voluntary Use of the Ship Energy Efficiency Operational Indicator (EEOI)" (MEPC.1/Circ. 684).

Likewise on customer request TL issues an updated "EEOI Certificate" based on updated values past termination of any further ship operational year according to instructions under 2. and 3.

F. Certification of Additional Environmental Protection Properties

1. On request, TL will also examine and document in the Environmental Passport other additional environmental protection properties of the ship surpassing the requirements B. and C., if these

- Are required by national regulations, and/or
- Technical verification thereof is possible beyond any doubt, by means of recognized testing procedures.

2. Details of the scope and execution for the testing and certification procedures will be decided by TL in each individual case.

3. Test certificates, statements of compliance and certificates of TL will be included in the Environmental Passport to document the elevated environmental standard of the ship.

4. Examples could be:

- Biocide-free coatings
- Particulate reduction from exhaust gases

- Technically advanced wastewater and/or sewage treatment plants needed to meet special regional legislation (e.g. Alaska Law)

- Pollution-free stern-tube seals

- etc.