



## March 2019 Development Paper

### MariEMS Learning Material

This is the 31st compilation by Professor Dr Reza Ziarati on the work of the EU funded Erasmus + MariEMS' partners and material extracted from the IMO TTT Course. The material is composed from Chapter 31 of the learning material. Readers are also advised to refer to the papers on IdealPort and IdealShip projects led by C4FF and published by MariFuture.

## 31. IMO Response: Maritime Environmental Regulatory Framework

International shipping is ruled by a set of international legal and regulatory frameworks. In this section, such regulatory frameworks are defined with a focus in understanding the shipping impact on climate change and the various provisions developed through the IMO to address this issue. The marine related international regulations to address the consequences of air emissions can be found in the UNCLOS and in the IMO MARPOL regulations. The UNCLOS regulations form the basis of the international law regulating the seas, while the IMO specifically regulates the international shipping. Both develop comprehensive regulatory regimes to be enforced by States.

### 31.1 UNCLOS (United Nations Convention on the Law of the Sea) Regulations and Environment

As previously mentioned, the UNCLOS possesses extensive references to the protection of the environment. In its preamble, the UNCLOS recalls the importance to:

"Promote the peaceful uses of the seas and oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment."

In addition to this statement, a complete part of the text is dedicated to the protection of the environment. Part XII reflects the main objectives of the UN in terms of environmental protection which occurred in parallel to the extensive negotiations to develop the UNCLOS. The most significant articles demonstrating the importance of State responsibility to protect the environment are presented below:

#### **Article 192: "General obligation**

States have the obligation to protect and preserve the marine environment"

#### **Article 194: "Measures to prevent, reduce and control pollution of the marine environment**

States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention."

#### **Article 195: "Duty not to transfer damage or hazards or transform one type of pollution into another**

In taking measures to prevent, reduce and control pollution of the marine environment, States shall act so as not to transfer, directly or indirectly, damage or hazards from one area to another or transform one type of pollution into another."

**Article 197: "Cooperation on a global or regional basis** States shall cooperate on a global basis, as appropriate, on a regional basis, directly or through competent international organizations, in formulating and elaborating international rules, standards and recommended practices and



procedures consistent with this Convention, for the protection and preservation of the marine environment, taking into account characteristic regional features.”

**Article 204:** “Monitoring of the risks or effects of pollution

1. States shall, consistent with the rights of other States, endeavour, as far as practicable, directly or through the competent international organizations, to observe, measure, evaluate and analyse, by recognized scientific methods, the risks or effects of pollution of the marine environment.
2. In particular, States shall keep under surveillance the effects of any activities which they permit or in which they engage in order to determine whether these activities are likely to pollute the marine environment.”

**Article 212:** “Pollution from and through the atmosphere

1. States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from or through the atmosphere, applicable to the air space under their sovereignty and to the vessels flying their flag or vessels or aircraft of their registry, taking into account internationally agreed rules, standards and recommended practices and procedures and the safety of air navigation.
2. States shall take other measures as may be necessary to prevent, reduce and control such pollution
3. States, acting especially through competent international organizations or diplomatic conference, shall endeavour to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control such pollution.”

In addition, various articles deal with the enforcement mechanisms by Flag State (Article 217), Port State (Article 218) and Coastal State (Article 220).

In short, the UNCLOS recalls:

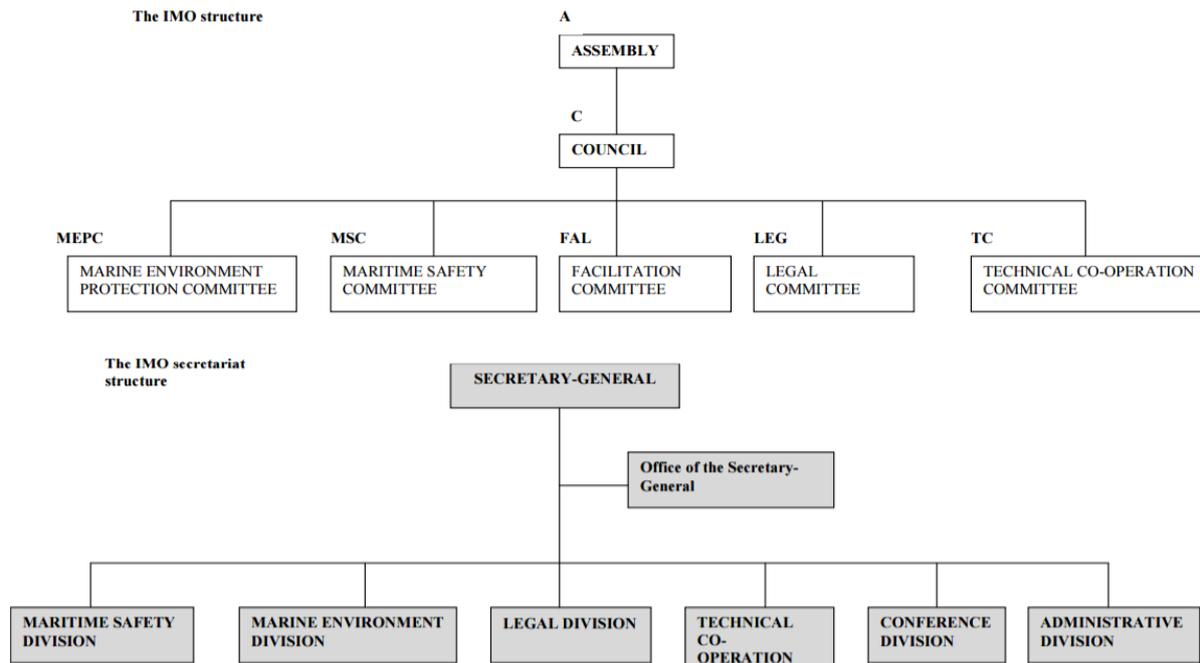
- The States duties to protect the environment and responsibility not to harm others.
- The measures developed should not transfer the damage or risks.
- The global and regional cooperation are paramount in environmental protection.
- The risks and effects of pollution must be assessed scientifically.
- The air pollution is an established concern.
- Compliance Monitoring and Enforcement systems have to be developed to verify the compliance of the activities.

UNCLOS demonstrates the importance of protecting the environment and developing proper enforcement mechanisms which can be materialized through certification and inspection regimes.

### 31.2 Overview of the IMO structure

In 1948, a UN body in charge of maritime affairs was created. The International Maritime Organization (IMO) acquired its final name in 1982.

The IMO presently consists of an Assembly, a Council, a number of Committees and a Secretariat. The structures of the IMO and its secretariat can be simplified as shown in Figure 31.2.1:



**Figure 31.2.1: IMO and its secretariat structures**

The aims of the IMO are summarized in the Article 1 of its constitutive Convention:

- (a) To provide machinery for co-operation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade; to encourage and facilitate the general adoption of the highest practicable standards in matters concerning the maritime safety, efficiency of navigation and prevention and control of marine pollution from ships; and to deal with administrative and legal matters related to the purposes set out in this Article;
- (b) To encourage the removal of discriminatory action and unnecessary restrictions by Governments affecting shipping engaged in international trade so as to promote the availability of shipping services to the commerce of the world without discrimination; assistance and encouragement given by a Government for the development of its national shipping and for purposes of security does not in itself constitute discrimination, provided that such assistance and encouragement is not based on measures designed to restrict the freedom of shipping of all flags to take part in international trade;
- (c) To provide for the consideration by the Organization of matters concerning unfair restrictive practices by shipping concerns in accordance with Part II;
- (d) To provide for the consideration by the Organization of any matters concerning shipping and the effect of shipping on the marine environment that may be referred to it by any organ or specialized agency of the United Nations;
- (e) To provide for the exchange of information among Governments on matters under consideration by the Organization."

For environmental purposes, the IMO have to support the enforcement of highest practical standards as well as maintain a close link with other UN bodies on such matters. The IMO provides governing tools and policies but the implementation and enforcement of IMO tools falls in the hand of the member States and their governments. "The IMO's role is thus primarily to adopt legislation, while enforcement lies with the Contracting Governments (the flag States)." (IMO, 2009)



### 31.3 IMO commitment to environmental protection

Since 1959, the IMO has proactively taken responsibility for the issues related to pollution by shipping. The Organization supports the development of regulations aiming to prevent pollution to the marine environment and addresses the introduction of technologies and specifics as defined by the UNCLOS:

- Article 1. “(4) “pollution of the marine environment” means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuary, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities;”
- Article 196 “States shall take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction or control, or the intentional or accidental introduction of species, alien or new, to a particular part of the marine environment, which may cause significant and harmful changes thereto.”

Maritime Environment Protection Committee (MEPC) is the IMO committee in charge of addressing the environmental issues for the IMO (see Figure 5.1). This Committee is supported by Sub-Committees sometimes shared with the Maritime Safety Committee. Also, the MEPC sets up working groups that deal with various items of its agenda (e.g. ballast water, air pollution, GHG emissions, etc.). The Committees and its working groups are supported by the IMO Secretariat that deals with all related administrative aspects.

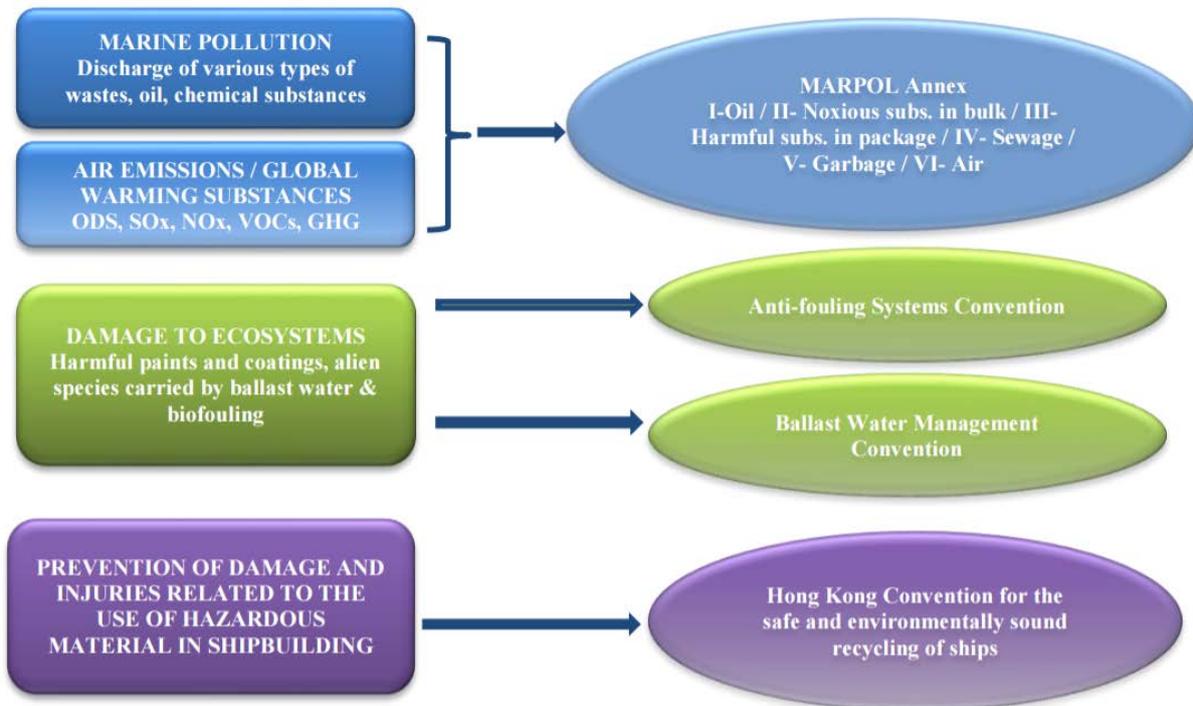
The MEPC may issue circulars and resolutions as well as draft resolutions to be adopted by the Assembly. The MEPC meets three times over two years (twice 1st year and once second year). During the MEPC sessions, various working groups or correspondence groups may be established to address particular issues. All States represented at the IMO may participate to discuss the issues related to pollution prevention and control as well as industry representatives and NGOs (Non-Governmental Organisations). Decisions are normally reached through consensus but if there is a need for voting, only Parties to relevant Convention (e.g. MARPOL Annex VI, Ballast Water Management) are eligible to cast their votes.

The IMO’s Marine Environment Division supports the MEPC and deals on a daily basis with relevant environmental issues but above all supports the working of MEPC and other IMO divisions in related areas. Today, the IMO regulations cover the whole ship’s pollution risks as presented in Figure 31.3.1. Specifically, IMO deals with the following Conventions:

- **MARPOL Convention** dealing with various types of pollutions.
- **Anti-Fouling System Convention**, entered into force in 2008, prohibits the use of harmful organotin compounds in anti-fouling paints used on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems. Antifouling systems to be prohibited or controlled are listed in the Convention.
- **Ballast Water Management Convention** entitled “International Convention for the Control and Management of Ships’ Ballast Water and Sediments (BWM)” was adopted in 2004 and awaits at this point in time (2015) ratification by enough member states. It aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships’ ballast water and sediments.



- **Hong Kong Convention** entitled “International Convention for the Safe and Environmentally Sound Recycling of Ships” was adopted in 2009 and awaits at this point in time (2015) ratification by enough member states. It aims at ensuring that ships, when being recycled after reaching the end of their operational lives; do not pose any unnecessary risk to human health and safety or to the environment.
- **London Convention** entitled the "Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972", is dealing with dumping into marine environment and has been in force since 1975. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter.



**Figure 31.3.1: IMO Conventions relating to the prevention of marine pollution relating to ship operations**

As stated above, the latest Conventions adopted but not yet entered into force are the International Convention for the Control and Management of Ships’ Ballast Water and Sediments, 2004, and the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009. The 1973 International Convention for the Prevention of Pollution from Ships (MARPOL) integrated the issue concerning the air pollution by ships in the Convention’s adoption of the 1997 Protocol creating the MARPOL Annex VI. The IMO and its member States recognize the importance of the environmental protection which became over the years a major item of concern for the Organization. During his MEPC 63 speech on 27 February 2012, the IMO Secretary General Sekimizu stated:

“\*...+ I see the promotion of sustainable shipping and sustainable maritime development as one of the major priorities of my tenure. \*...+Rio+20 is an opportunity to launch a vision for sustainable maritime development that will underpin future maritime developments within a green economy in which IMO should play a major and significant role.”

In addition, the IMO shows a strong willingness to address the issue of the climate change by promoting innovative regulations in the framework of the UN discussion on GHG emissions. This disposition has been demonstrated through the adoption of various instruments during MEPC 62 in



2011 and the intensive discussions on developing further technical and operational measures such as data collection system for ships as part of wider MRV (Monitoring, Reporting and Verification) debate.

“IMO will continue to make its contribution to global efforts to reduce greenhouse gas emissions within the context of the ongoing UN-wide debate on climate change. We will continue to cooperate closely with the United Nations Framework Convention on Climate Change and with other relevant UN bodies, as appropriate. Also in this context, IMO will evaluate the implications for shipping of any mechanism to be established for the envisaged Green Climate Fund and impress upon the UNFCCC that any contributions must be proportionate to shipping’s contribution to the global emission of greenhouse gases.

While participating in the Climate Change debate at the UN, IMO will proceed in parallel with its own programme of work. In this respect, it is encouraging that last December’s Durban Conference on climate change welcomed the progress made by IMO. “(IMO SG Mr. Sekimizu speech, 27 February 2012)

### 31.4 MARPOL Convention

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships. It was adopted on 2 November 1973 at IMO and subsequently amended by its Protocol in 1978. The combined instrument entered into force on 2 October 1983. The Convention includes regulations aimed at preventing and minimizing pollution from ships, both accidental pollution and that from routine operations, and includes six technical Annexes:

**Annex I - Regulations for the Prevention of Pollution by Oil** (entered into force 2 October 1983): Covers prevention of pollution by oil from operational measures as well as from accidental discharges. The 1992 amendments to Annex I made it mandatory for new oil tankers to have double hulls and brought in a phase-in schedule for existing tankers to fit double hulls.

**Annex II - Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk** (entered into force 2 October 1983): Details the discharge criteria and measures for the control of pollution by noxious liquid substances carried in bulk; some 250 substances were evaluated and included in the list appended to the Convention; the discharge of their residues is allowed only to reception facilities until certain concentrations and conditions.

**Annex III - Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form** (entered into force 1 July 1992): Contains general requirements for the issuing of detailed standards on packing, marking, labelling, documentation, stowage, quantity limitations, exceptions and notifications. For the purpose of this Annex, the “harmful substances” are fully defined.

**Annex IV - Prevention of Pollution by Sewage from Ships** (entered into force 27 September 2003): Contains requirements to control pollution of the sea by sewage; the prohibition of discharge of sewage into the sea, approved sewage treatment plant, etc. with lots of details on the subject.

**Annex V - Prevention of Pollution by Garbage from Ships** (entered into force 31 December 1988): Deals with different types of garbage and specifies the distances from land and the manner in which they may be disposed of; the most important feature of the Annex is the complete ban imposed on the disposal into the sea of all forms of plastics.

**Annex VI - Prevention of Air Pollution from Ships** (entered into force 19 May 2005): Sets limits on sulphur oxide (SO<sub>x</sub>) and nitrogen oxide (NO<sub>x</sub>) emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances; sets designated Emission Control Areas with more stringent

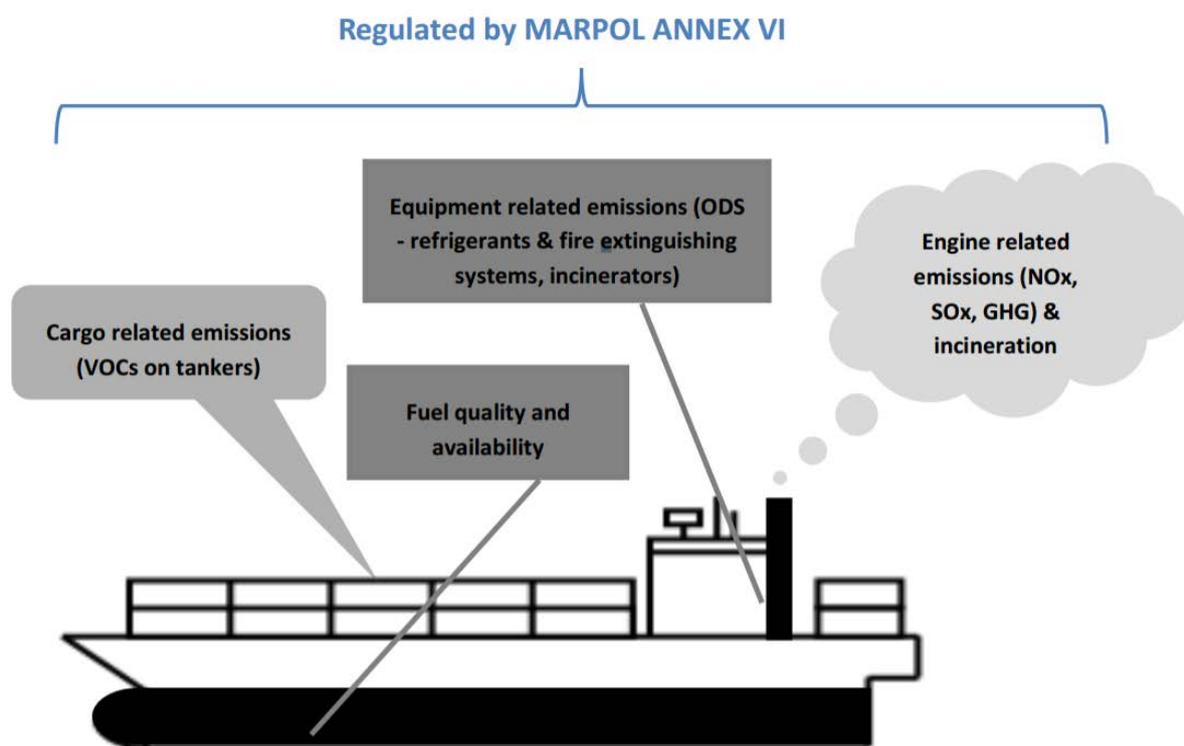


standards for SO<sub>x</sub> and NO<sub>x</sub>. A new chapter adopted in 2011 covers mandatory technical and operational energy efficiency measures aimed at reducing GHG emissions from ships. A State to become a Party to MARPOL must ratify MARPOL Annexes I and II. The rest of Annexes are voluntary as far as membership to MARPOL Convention is concerned.

### 31.5 MARPOL Annex VI

MARPOL Annex VI is the latest added part to MARPOL Convention in 1997 that entered into force in 2005. Major modifications / amendments to MARPOL Annex VI occurred in 2008 on NO<sub>x</sub> Technical Code and 2011 with the insertion of a new Chapter 4 which deals with energy efficiency regulations for ships (effectively dealing with GHG emissions).

Therefore, today, the Annex VI encompasses air pollutants and GHG emissions combined. The regulations include also elements like bunker fuels, incinerators, reception facilities, Emission Control Areas, Ozone Depleting Substances, etc. The scope of MARPOL Annex VI is depicted in Figure 31.5.1.



**Figure 31.5.1: Ship's air emissions regulated by MARPOL Annex VI**

MARPOL Annex VI currently comprises of a number of chapters that are briefly described below with their encompassing regulations.

**Chapter 1 – General:** Introduces some of the basics of the Convention as well as certain useful definitions. Under this chapter, the following regulations are fully specified:

- Regulation 1 – Applications: This specifies the application domain of MARPOL Annex VI.
- Regulation 2 – Definitions: This provides definitions for terms that have regulatory significance.
- Regulation 3 - Exceptions and exemptions: This regulation describes the conditions under which a ship or a marine platform could be exempted from complying with MARPOL Annex VI.
- Regulation 4 – Equivalent: This allows the use of alternative method of compliance and the conditions under which they will be acceptable.



**Chapter 2 – Survey, certification and means of control:** describe the survey requirements, certification system and control principles including port State control issues and violation detection and enforcement. Under this chapter, the following regulations are fully specified:

- Regulation 5 - Surveys: This regulation describes the survey and inspection requirements.
- Regulation 6 - Issue of endorsement of certificate: The rules for issuance of certificates, forms of certificates, etc. are specified under this regulation.
- Regulation 7 - Issue of a certificate by another party: This regulation allows another Party to issue a certificate on behalf of a Party.
- Regulation 8 - Form of certificates: The forms of various certificates are specified here.
- Regulation 9 - Duration and validity of certificates: The duration and validity certificates are discussed under this regulation.
- Regulation 10 - Port State control and operational requirements: The port State control aspects and relevant rules are explained in this regulation.
- Regulation 11 - Detection of violation and enforcement: Specific aspects under which a ship could be detained are described under this regulation.

**Chapter 3 – Requirements for control of emissions from ships:** this chapter details the measures to address various air pollutants and important related issues as bunker management and incinerator. Under this chapter, the following regulations are fully specified:

- Regulation 12 –Ozone-depleting substances (ODSs): This regulation prohibits deliberate release of ODSs and sets timeline for phasing out of certain ODSs.
- Regulation 13 – Nitrogen oxides (NOx): This part of the Annex regulates the NOx emissions by ship for engines installed on ships constructed after 2000. Three tiers describe the NOx limits to be achieved after 2000, 2011 and 2016. In addition to the International Air Pollution Prevention (IAPP) Certificate, the ship must comply with the NOx Technical Code 2008, have an Engine International Air Pollution Prevention (EIAPP) Certificate and possesses NOx Technical File and a record book of engine parameters.
- Regulation 14 – Sulphur oxides (SOx): This regulation sets maximum sulphur contents for fuels used on ships (3.50% after January 2012) and the concept of SOx emission control area (SECA) with the current designated SECAs as well as relevant sulphur limits.
- Regulation 15 – Volatile Organic Compounds (VOCs): The regulation emphasizes on the need to reduce VOC releases occur during loading in oil ports and terminals. All oil tankers visiting such regulated ports/terminals (ports/terminals that are designated as VOCs control ports/terminals based on this regulations) must be equipped with collection systems and after 2010 a VOC management plan must be implemented.
- Regulation 16 – Shipboard incineration: Incinerators have to be approved and meet the IMO standards. Various substances are prohibited to incinerate.
- Regulation 18 – Fuel oil availability and quality: The regulation covers the availability, the quality, the supervision of suppliers, the PSC aspects, fuel sampling and sample retentions, the bunker delivery note, etc.

The NOx Technical Code and some other IMO Resolutions support the implementation of this part of MARPOL Annex VI.

**Chapter 4 – Regulation on energy efficiency for ships:** This chapter 4 was developed to regulate energy efficiency of ships. It came into force in January 2013. Under this chapter, the following regulations are specified:



- Regulations 19 – Application: This regulation specifies the application domain and scope of the Chapter 4 regulations.
- Regulations 20 – Attained Energy Efficiency Design Index (Attained EEDI): This regulation specifies the requirements on Attained EEDI including the calculation processes and survey and verification aspects.
- Regulations 21 – Required EEDI: This regulation deals with the Required EEDI, its calculation using reference lines and reduction factors and its calculation processes. Regulation 21.5 also makes provisions that the EEDI must not impair the safe manoeuvrability of the ships.
- Regulation 22 - Ship Energy Efficiency Management Plan (SEEMP): This regulation specifies the requirement for ships to have a SEEMP on board and how the SEEMP should be developed.
- Regulation 23 - Promotion of technical co-operation and transfer of technology relating to the improvement of energy efficiency of ships: This regulation emphasizes the importance to enhance technical cooperation and transfer of technology to support energy efficiency improvements on the world fleet, in particular for the benefit of developing countries.