AVIN INTERNATIONAL LTD

SHIPPING and ENVIRONMENT

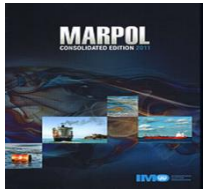
5th ARAB-HELLENIC ECONOMIC FORUM

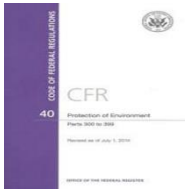
Athens 29 – 30 November 2016

Shipping – which transports about 90% of global trade – is, statistically, the least environmentally damaging mode of transport, when its productive value is taken into consideration.

For example, the vast quantity of grain required to make the world's daily bread could not be transported any other way than by ship. Moreover, set against land-based industry, shipping is, overall, a comparatively minor contributor to marine pollution from human activities.

Source : IMO





Key Definitions

A Shipping Company having developed its Safety System also in accordance with ISO 14001 and ISO 50001, has established and implemented an

Environmental Management System (EMS) and **Energy Management System (EnMS)** respectively**.**

Organization:
The “Company” = its offices, all personnel and vessels as a whole

Environment:
Surroundings in which a company operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation;

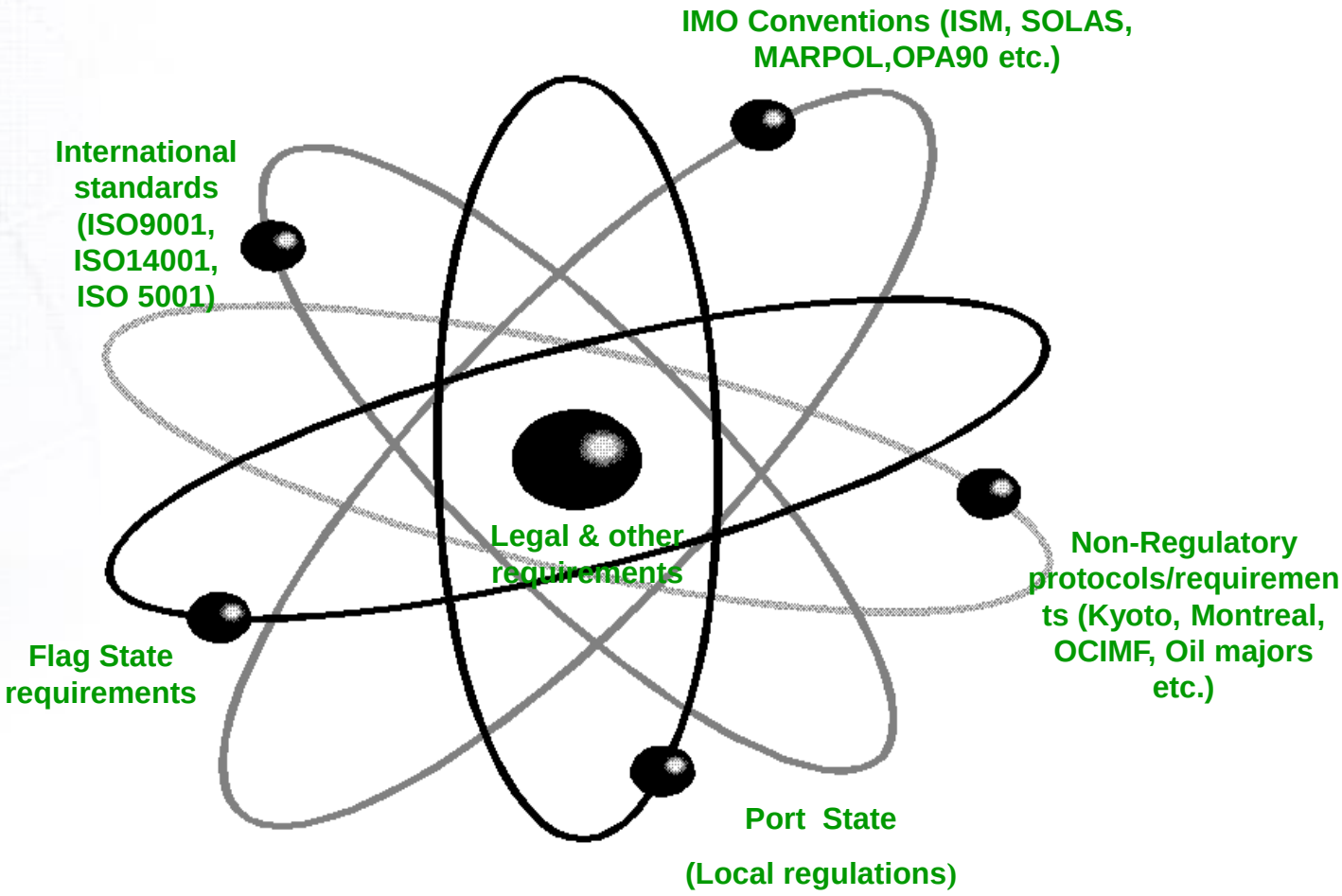
Environmental Aspect:
A company activity, product or service which can interact with the environment.

Environmental Impact:
Any change to the environment, whether adverse or beneficial

Energy Efficiency:
A ratio between an output of performance and service and an input of energy.

Energy Savings:
An amount of saved energy determined by measuring before and after implementation of energy efficiency improvement measures.

Regulations & Legislation



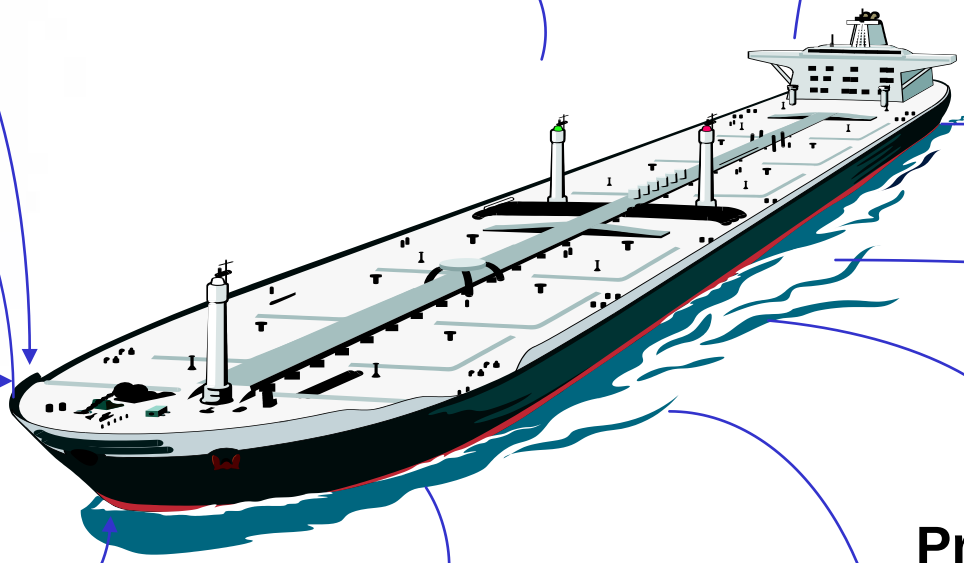
The Shipping Company ensures that legal and other requirements that are applicable to its environmental aspects are taken into account in its EMS and EnMS.

Regulations & Legislation

- I.M.O. Conventions (SOLAS, MARPOL, ISM Code, STCW 95)
- Classification Societies of vessels
- Flag Administrations of vessels
- Local Regulations, Laws and Requirements
- Port Authorities
- USA Federal and all applicable laws and regulation upon whose waters the Company's vessels operate
- Company's Environmental Standards

- Environmental protocols:
  - **Montreal Protocol** related to substances that **deplete the ozone layer** and includes Halons (fire extinguishing medium), ChloroFluoroCarbons (CFCs), HydroChloroFluoroCarbons (HCFCs) (cooling media like R-22) and other gases;
  - **Kyoto Protocol** related to substances that contribute to **climate change** and includes carbon dioxide (CO_2), methane (CH_4) nitrous oxide (N_2O) and other gases. These gases are called **Greenhouse Gases** since they contribute to global warming (greenhouse effect).

Ship Board Operations



Energy

Fuels

Materials

Water

Reusable or Recyclable Materials

Nuisances

Land Contamination

Air emissions
Exhaust Gases
Greenhouse Gases
Freon/Halon
Waste Combustion

Thermal Energy

Wastes
Sewage
Garbage

Process Liquid Wastes
Oil, Bilge water

Water Waste
Ballast Water

Environmental Aspects

One activity may concern several aspects, and an aspect may result in several impacts. Accordingly, an impact may arise from several different aspects related to several activities.

- **The Environmental Aspects main categories are**:

- Emissions to air;
- Discharges to water;
- Contamination of land (e.g. discharge of garbage to shore facilities);
- Garbage management;
- Sewage management;
- Water ballast management;
- Use of raw materials and natural resources;
- Other environmental & community issues.

Environmental Impacts

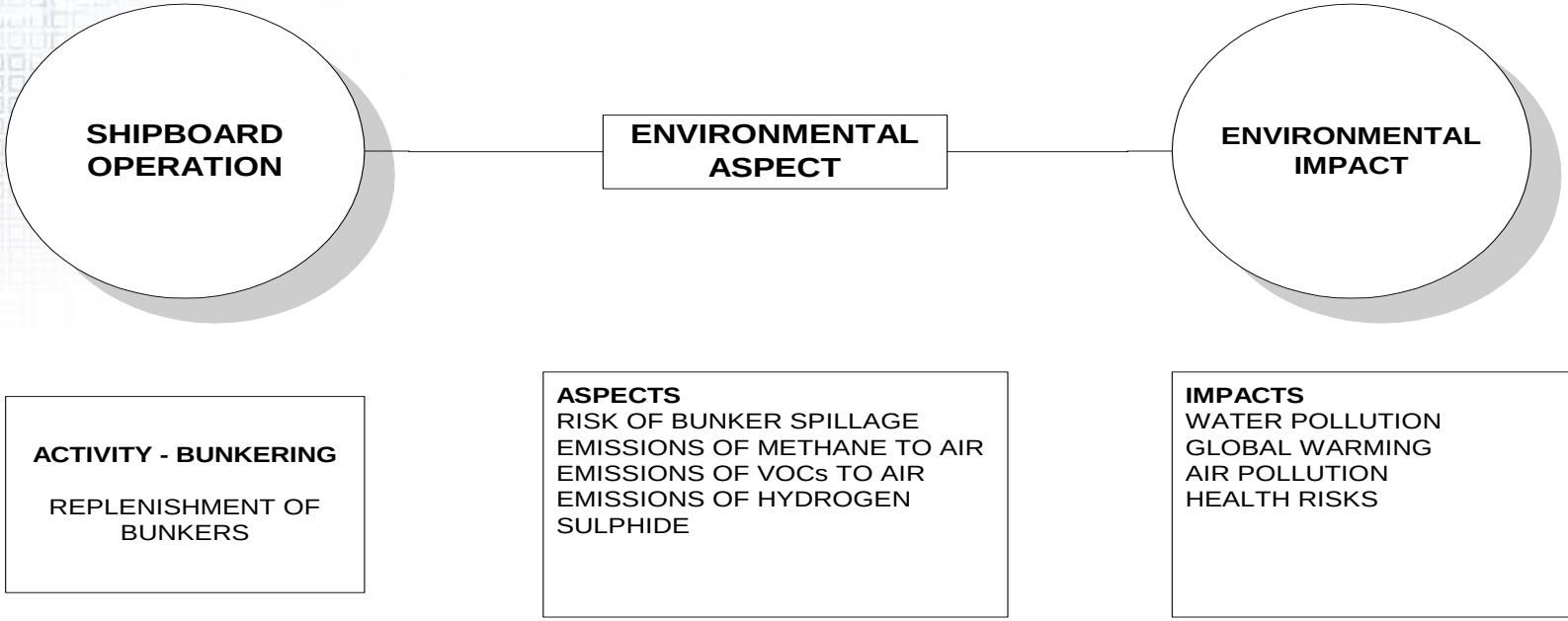
➢ The main Environmental Impacts are:

- Green house effect
- Global warming
- Depletion of ozone layers
- Smog, Acid rain
- Depletion of natural resources
- Toxic effects to marine life & damage to human health
- Contaminating the marine environment with foreign micro organisms and/or bacteria
- Downgrading of landscape and seascape
- Loss of fisheries
- Photochemical Pollution

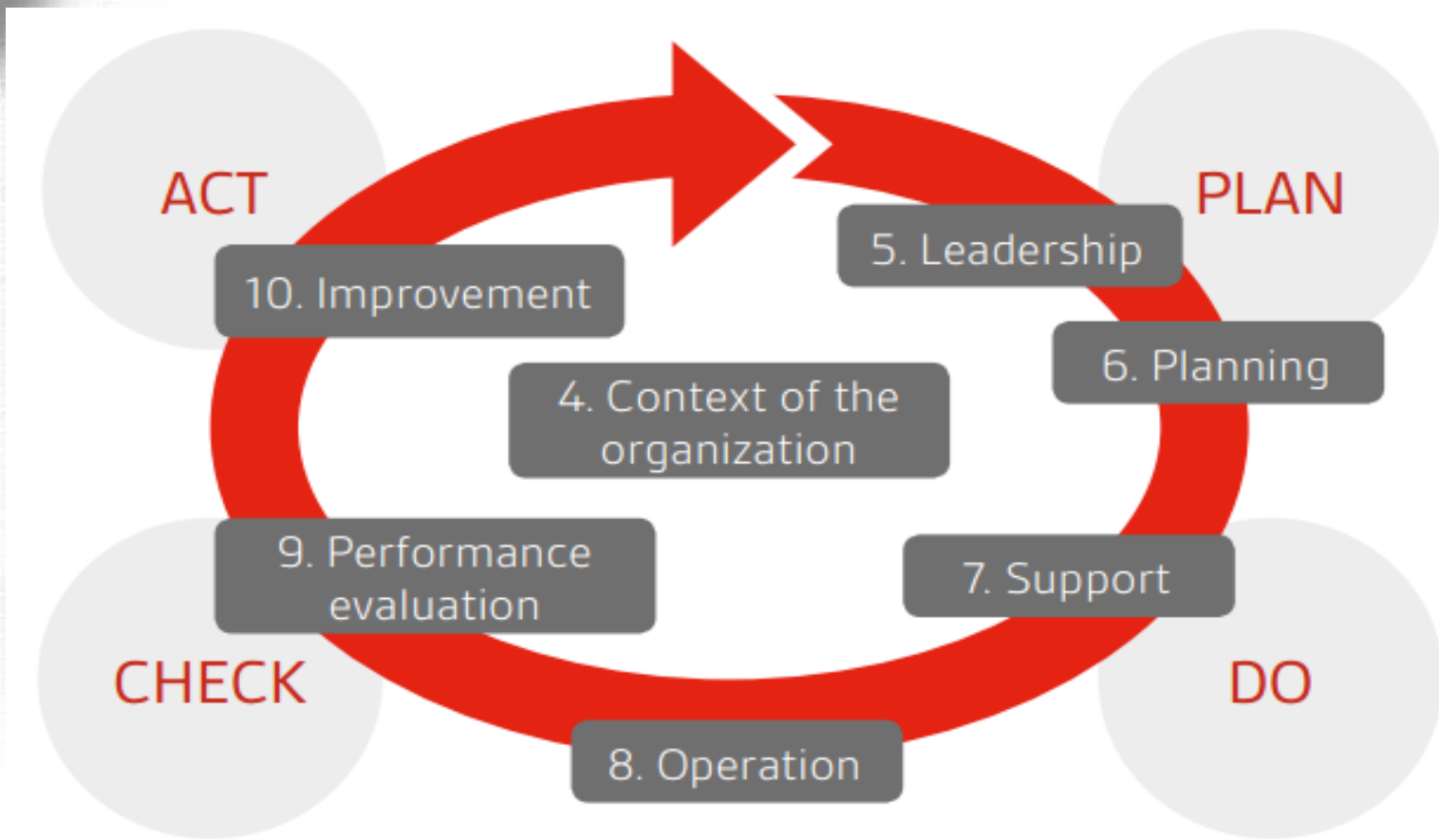
Environmental Procedures & Planning

Planning is critical to the fulfilment of the Environmental Policy and the establishment, implementation and maintenance of the EMS. The Company has a planning process that includes:

- identification of environmental aspects and determination of those which are significant;
- identification of applicable legal and other requirements to which the Company subscribes;
- setting of internal performance criteria, where appropriate;
- setting of objectives and targets and establishment of programs to achieve them.



“Plan-Do-Check-Act” ECO Management Model

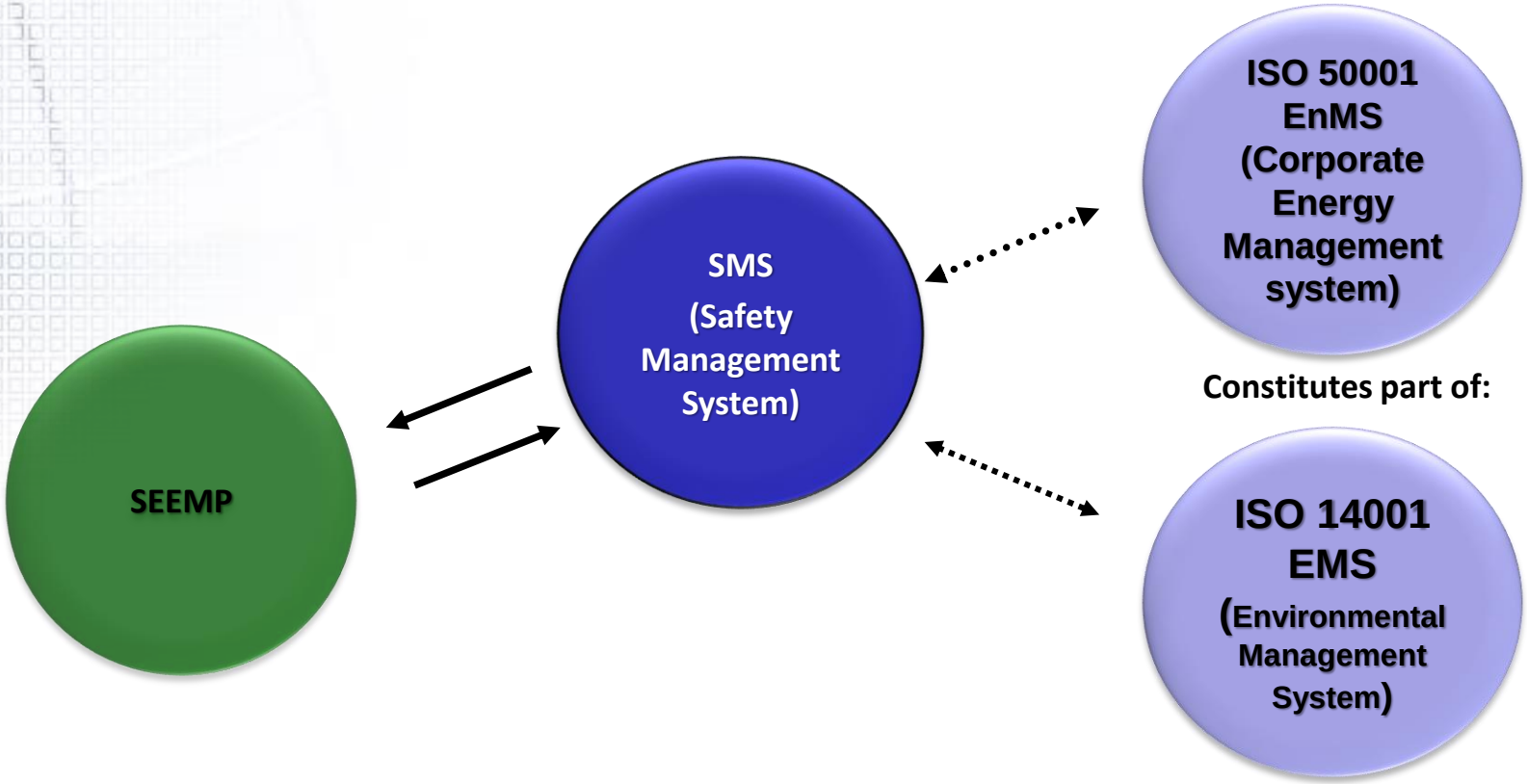


Continual Improvement

Process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with the company’s environmental policy.

Ship Energy Efficiency Management Plan (SEEMP)

The purpose of a Ship Energy Efficiency Management Plan (SEEMP) is to establish a mechanism for a company and/or a ship to improve the energy efficiency of a ship's operation. The plan is linked to the Company's Policy on energy Efficiency Management and to the relevant Environmental Program on Energy Efficiency which has been established, maintained and implemented in accordance with the ISO 14001 procedures.



MARPOL requirements for oil discharge

Any Discharge to be duly inserted in Oil Record Book Part I.

OIL TANKERS OF ALL SIZES AND OTHER SHIPS OF 400 GRT AND ABOVE

(1) Any discharge into the sea of oil or oily mixtures from ships shall be prohibited.

A. Discharges OUTSIDE special areas (2) Any discharge into the sea of oil or oily mixtures from ships of 400 gross tonnage and above shall be prohibited except when all the following conditions are satisfied:	1. the ship is proceeding *en route*; 2. the oily mixture is processed through an oil filtering equipment meeting the requirements of MARPOL Annex I 3. the oil content of the effluent without dilution does not exceed 15 parts per million 4. the oily mixture does not originate from cargo pump room bilges on oil tankers; and 5. the oily mixture, in case of oil tankers, is not mixed with oil cargo residues
B. Discharges in special areas (3) Any discharge into the sea of oil or oily mixtures from ships of 400 gross tonnage and above shall be prohibited except when all of the following conditions are satisfied:	1. the ship is proceeding *en route*; 2. the oily mixture is processed through an oil filtering equipment meeting the requirements of MARPOL Annex I 3. the oil content of the effluent without dilution does not exceed 15 parts per million; 4. the oily mixture does not originate from cargo pump room bilges on oil tankers; and 5. the oily mixture, in case of oil tankers, is not mixed with oil cargo residues.

(4) In respect of the Antarctic area, any discharge into the sea of oil or oily mixtures from any ship shall be prohibited.

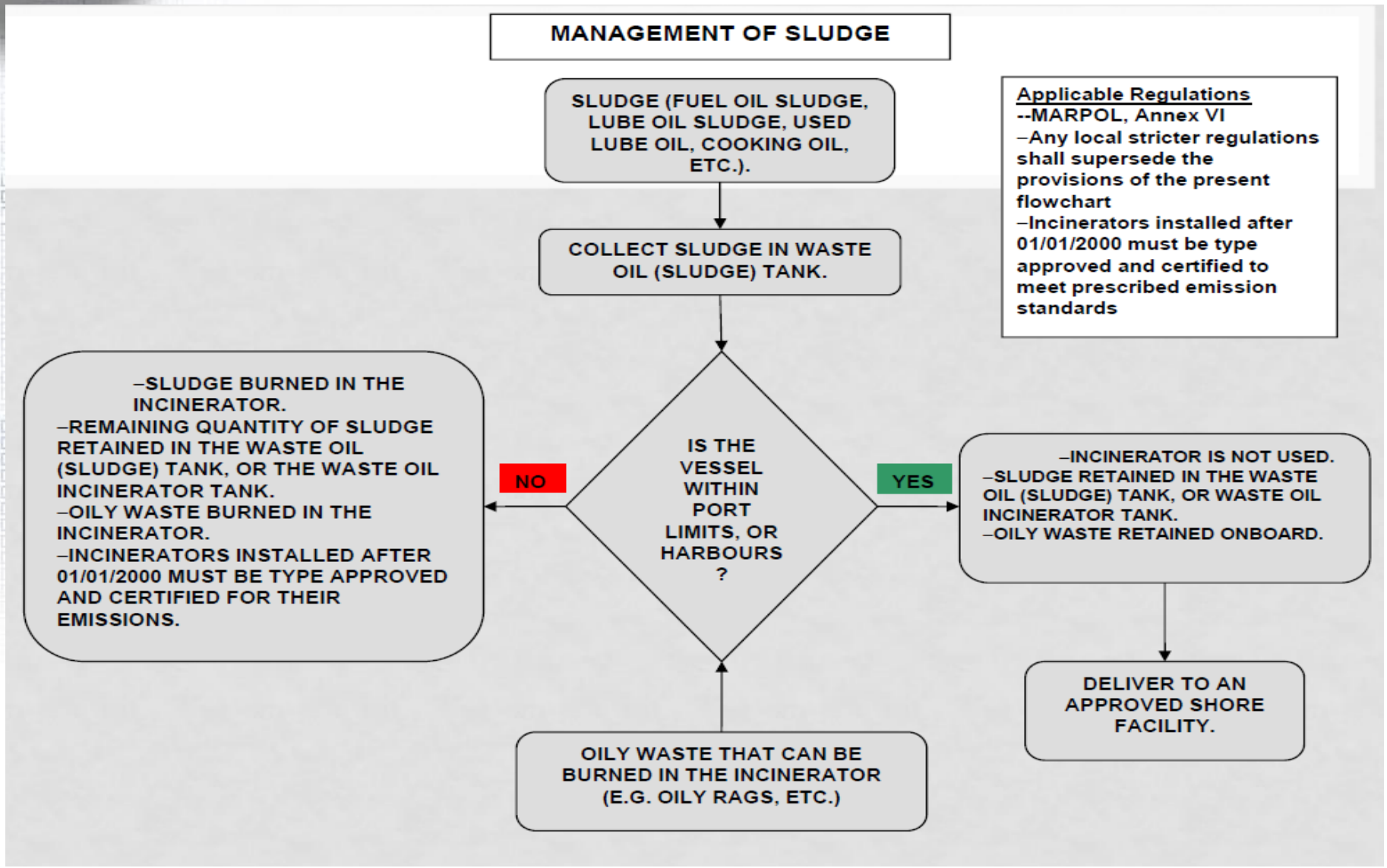
(5) Nothing in this regulation shall prohibit a ship on a voyage only part of which is in a special area from discharging outside a special area in accordance with para 2 above.

OIL RECORD BOOK (ORB)

ORB is a valuable means of providing proof that the vessel fully complies with anti-pollution MARPOL Annex I, hence,

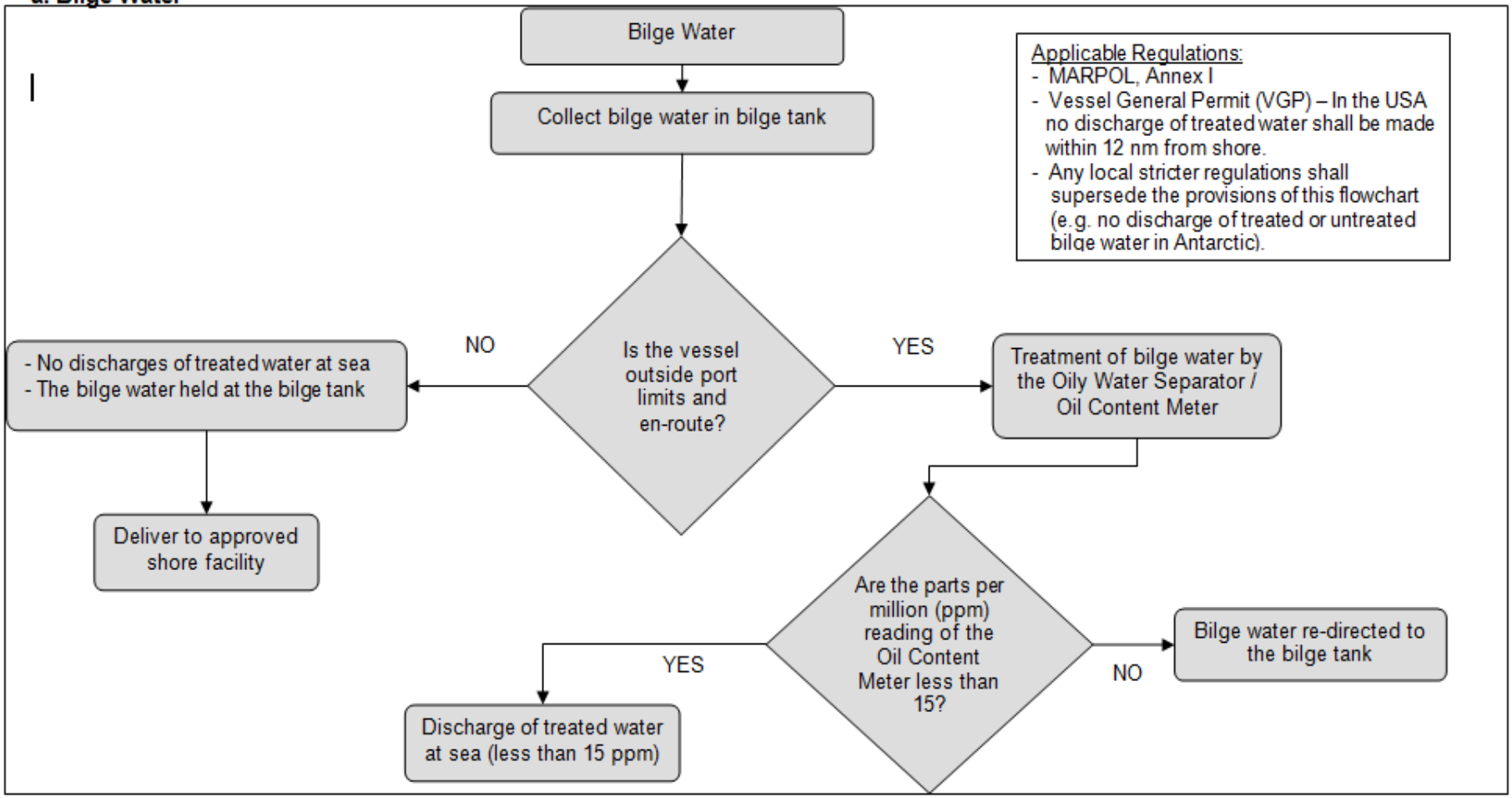
- **All entries must always be written by ink pen**
- **Countersigned by the C/E Signed by the Master**
- **Any errors must be ruled out by a single line. Corrective fluid, double writing is <u>prohibited.</u>**

MANAGEMENT OF SLUDGE



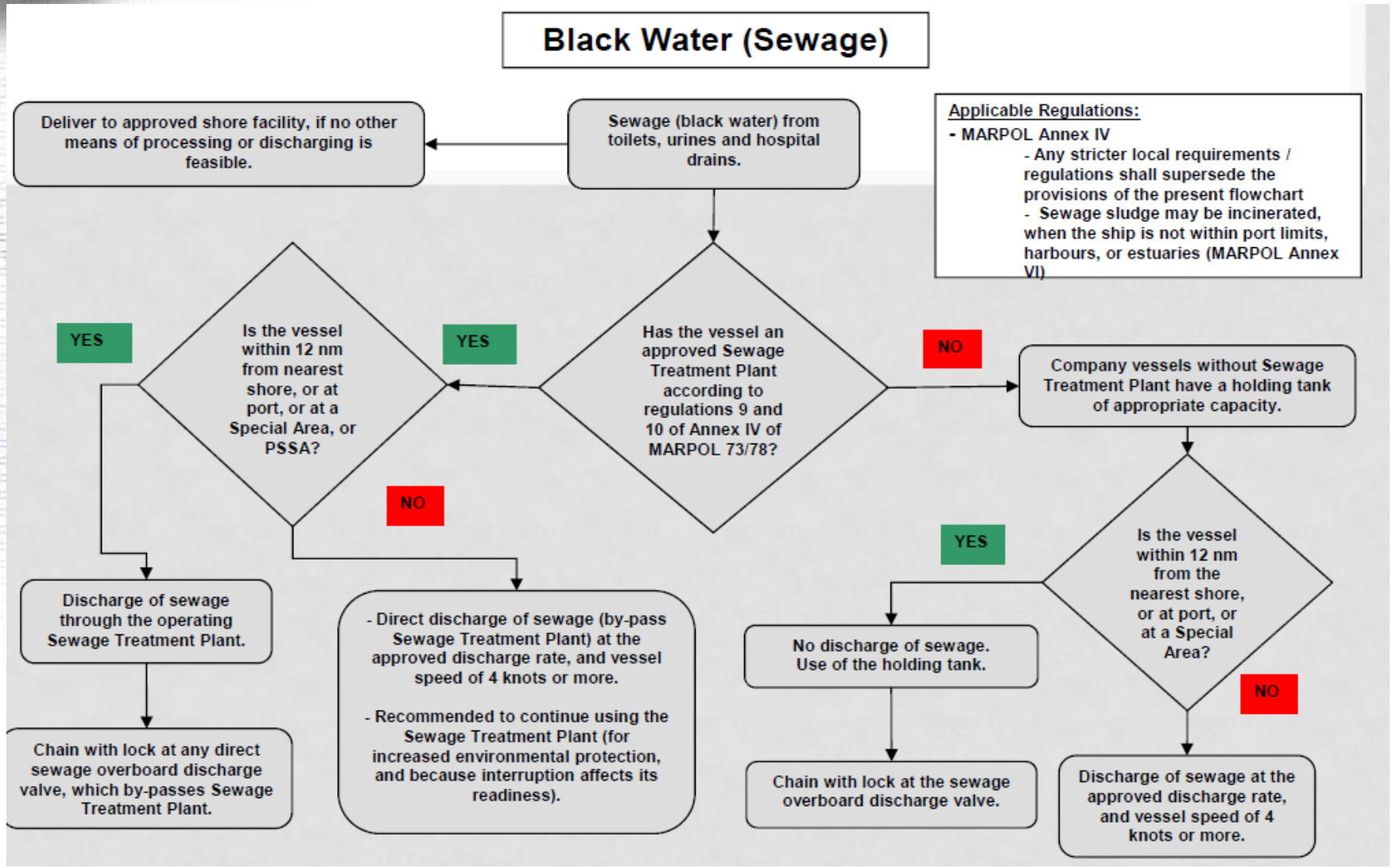
BILGE WATER

a. Bilge Water



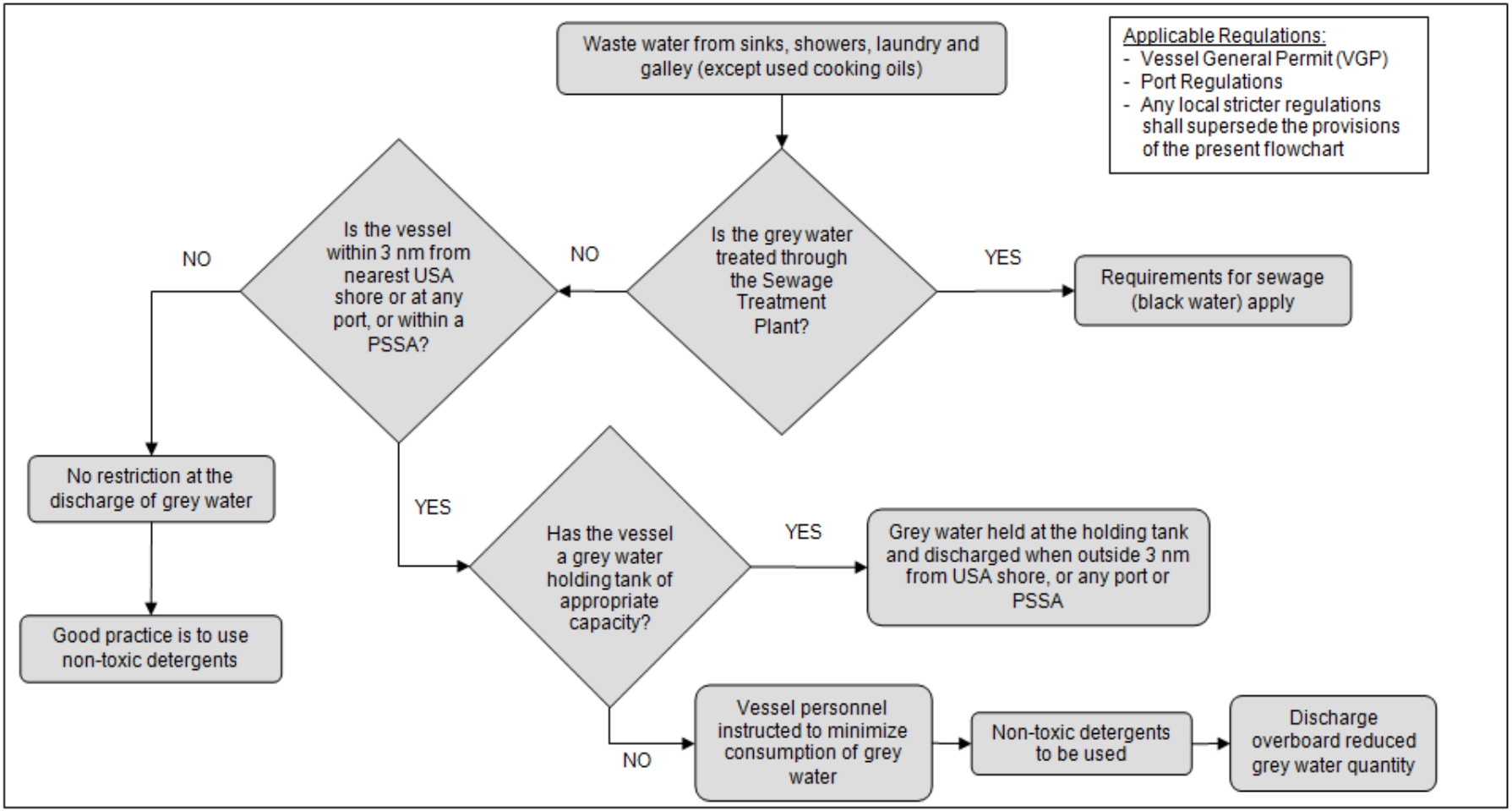
NOTE: The present flow chart was created on condition that the OWS and OCM are properly operating. In case of defect of the OWS and / or OCM, then the bilge water shall be held on board, or delivered at approved shore facilities.

SEWAGE


Black Water (Sewage)
Sewage (black water) from toilets, urines and hospital drains.
Deliver to approved shore facility, if no other means of processing or discharging is feasible.
Applicable Regulations:
- MARPOL Annex IV
- Any stricter local requirements / regulations shall supersede the provisions of the present flowchart
- Sewage sludge may be incinerated, when the ship is not within port limits, harbours, or estuaries (MARPOL Annex VI)
Has the vessel an approved Sewage Treatment Plant according to regulations 9 and 10 of Annex IV of MARPOL 73/78?
YES
NO
Is the vessel within 12 nm from nearest shore, or at port, or at a Special Area, or PSSA?
YES
NO
Company vessels without Sewage Treatment Plant have a holding tank of appropriate capacity.
Discharge of sewage through the operating Sewage Treatment Plant.
Chain with lock at any direct sewage overboard discharge valve, which by-passes Sewage Treatment Plant.
- Direct discharge of sewage (by-pass Sewage Treatment Plant) at the approved discharge rate, and vessel speed of 4 knots or more.
- Recommended to continue using the Sewage Treatment Plant (for increased environmental protection, and because interruption affects its readiness).
Is the vessel within 12 nm from the nearest shore, or at port, or at a Special Area?
YES
NO
No discharge of sewage. Use of the holding tank.
Chain with lock at the sewage overboard discharge valve.
Discharge of sewage at the approved discharge rate, and vessel speed of 4 knots or more.

GREY WATER

d. Grey Water



NOTE: PSSA stands for Particularly Sensitive Sea Area, where any particular requirements should be followed.

MARPOL - GARBAGE DISPOSAL

SIMPLIFIED OVERVIEW OF THE DISCHARGE PROVISIONS OF THE REVISED

MARPOL ANNEX V

(resolution MEPC.201(62)) which enters into force on 1 January 2013

IMO INTERNATIONAL MARITIME ORGANIZATION

Type of garbage	Ships outside special areas	Ships within special areas	Offshore platforms and all ships within 500 metres of such platforms
Food waste comminuted or ground	**Discharge permitted** ≥ 3 nautical miles from the nearest land and *en route*	**Discharge permitted** ≥ 12 nautical miles from the nearest land and *en route*	**Discharge permitted** ≥ 12 nautical miles from the nearest land
Food waste not comminuted or ground	**Discharge permitted** ≥ 12 nautical miles from the nearest land and *en route*	Discharge prohibited	Discharge prohibited
Cargo residues[1] not contained in wash water	**Discharge permitted** ≥ 12 nautical miles from the nearest land and *en route*	Discharge prohibited	Discharge prohibited
Cargo residues[1] contained in wash water		**Discharge only permitted in specific circumstances[2]** and ≥ 12 nautical miles from the nearest land and *en route*	
Cleaning agents and additives[1] contained in cargo hold wash water	**Discharge permitted**	**Discharge only permitted in specific circumstances[2]** and ≥ 12 nautical miles from the nearest land and *en route*	Discharge prohibited
Cleaning agents and additives[1] contained in deck and external surfaces wash water		**Discharge permitted**	
Carcasses of animals carried on board as cargo and which died during the voyage	**Discharge permitted** as far from the nearest land as possible and *en route*	Discharge prohibited	Discharge prohibited
All other garbage including plastics, domestic wastes, cooking oil, incinerator ashes, operational wastes and fishing gear	Discharge prohibited	Discharge prohibited	Discharge prohibited
Mixed garbage	When garbage is mixed with or contaminated by other substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply		

1 These substances must not be harmful to the marine environment.

2 According to regulation 6.1.2 of MARPOL Annex V, the discharge shall only be allowed if: (a) both the port of departure and the next port of destination are within the special area and the ship will not transit outside the special area between these ports (regulation 6.1.2.2); and (b) if no adequate reception facilities are available at those ports (regulation 6.1.2.3).

For the full text of the respective discharge requirements, please refer to the text of the revised MARPOL Annex V, and for more detailed guidance please consult the 2012 Guidelines for the implementation of MARPOL Annex V (see IMO publication, sales number IB656E).

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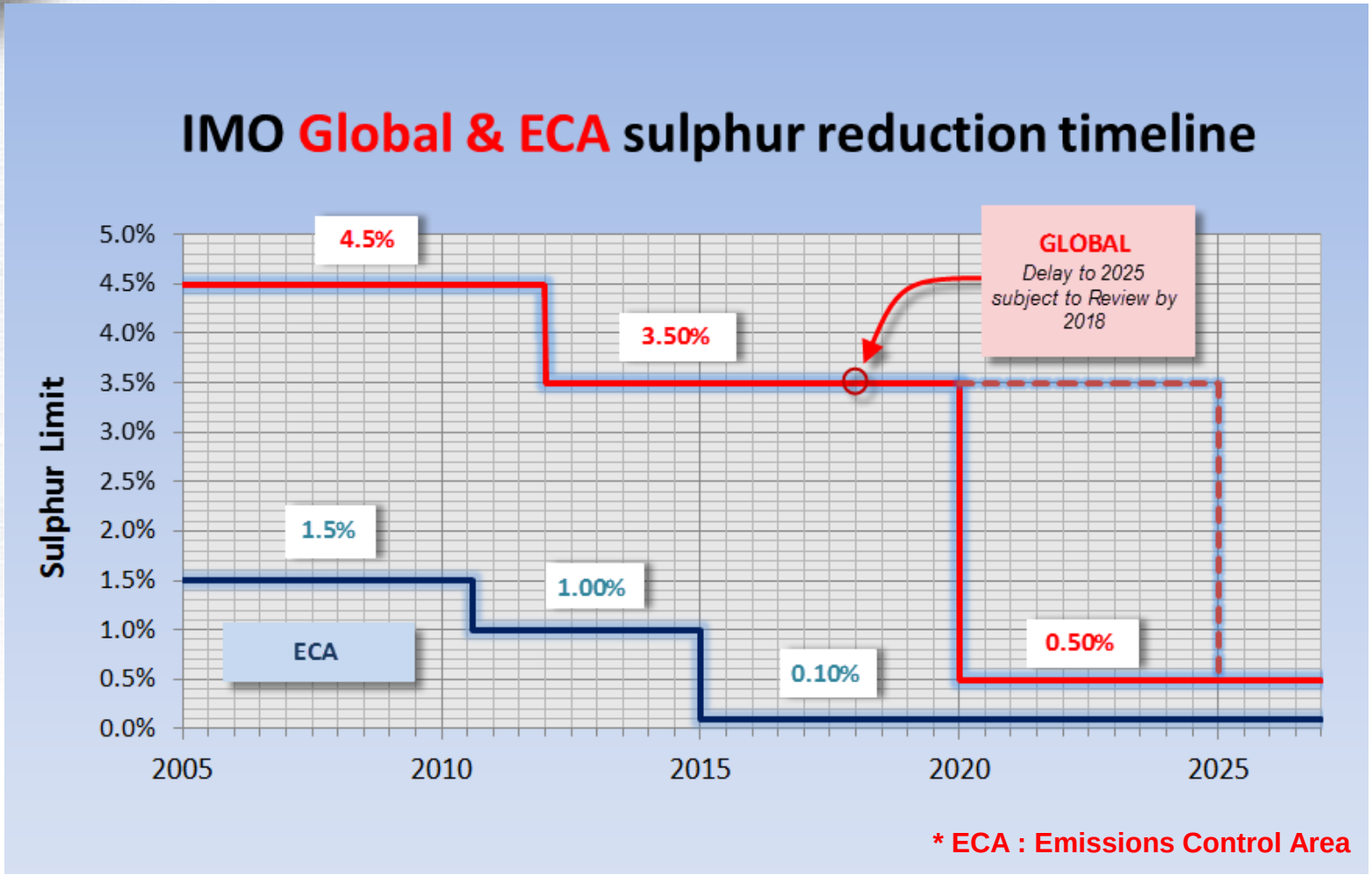
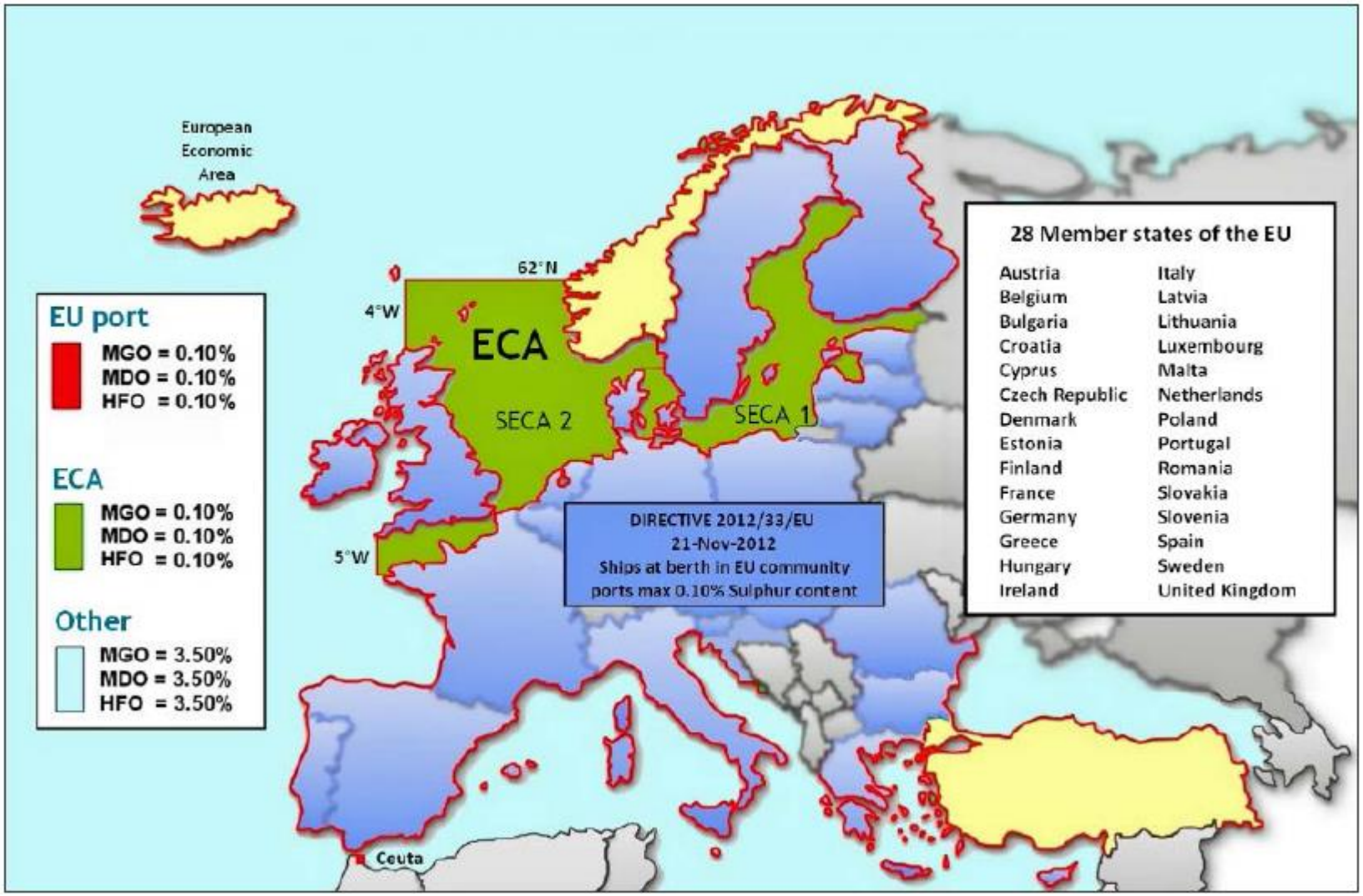
MARPOL 73/78 ANNEX VI

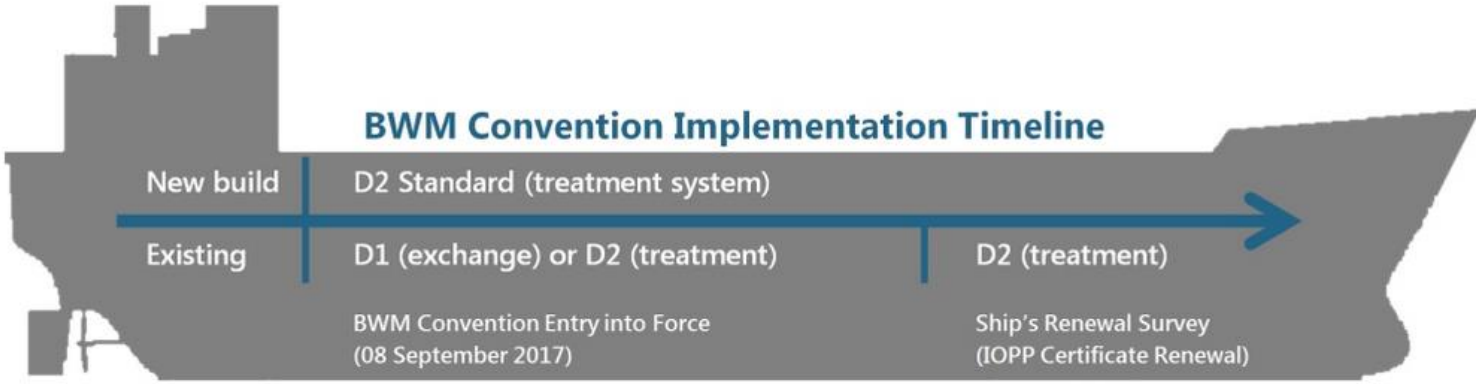


ECA Areas – Europe



FUTURE LEGISLATION

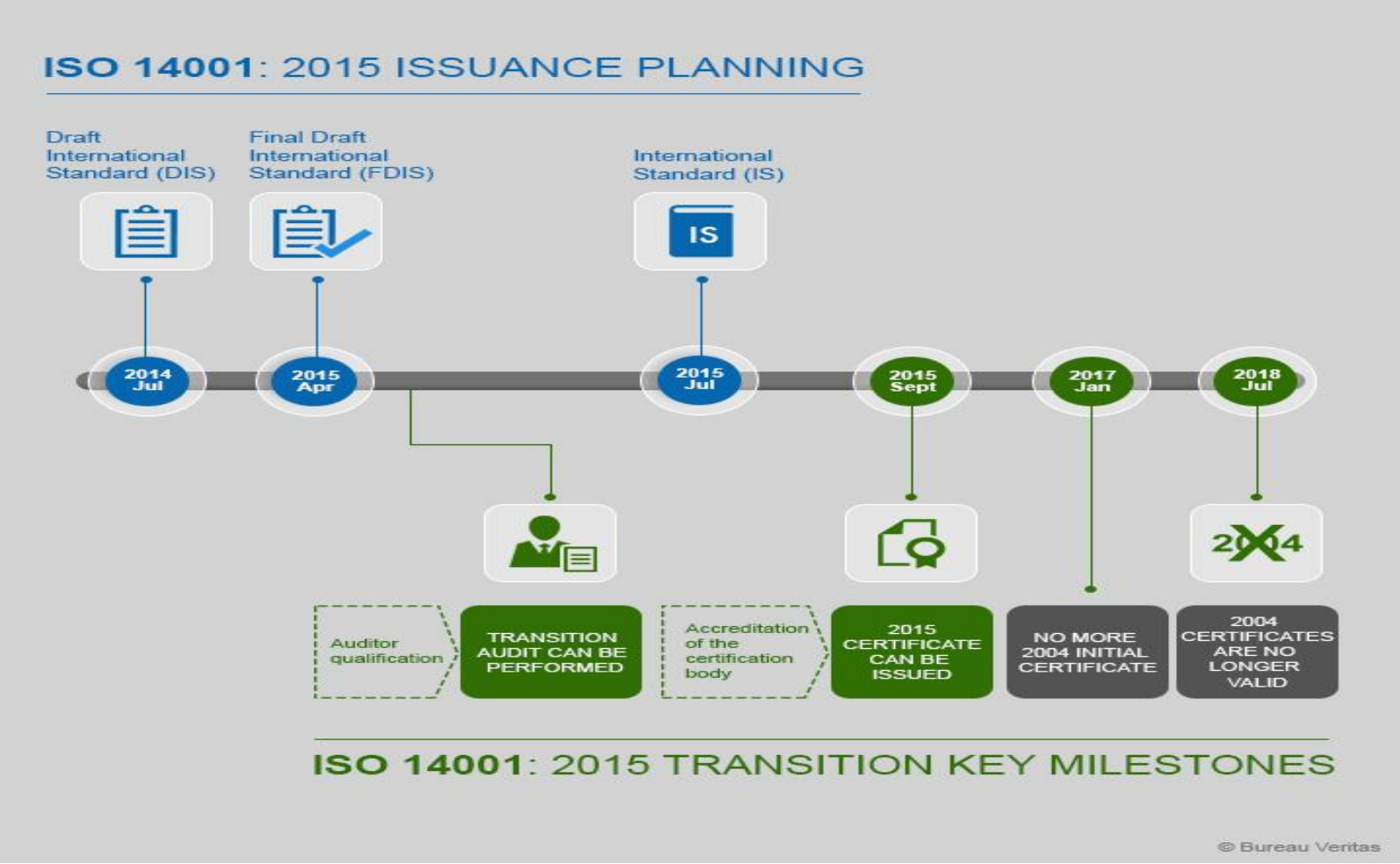
Ballast Water Management Convention



- BWM Convention was recently ratified and will enter into force on **8 September 2017.**
- D1 standard : ballast water exchange, which must be undertaken within open ocean areas, >200nm from land and in seas >200m deep.
- D2 standard : approved ballast water treatment systems.

FUTURE LEGISLATION

ISO 14001:2015 timeline



FUTURE LEGISLATION

EU shipping MRV regulation

- **Monitoring**
- **Reporting**
- **Verification**

of fuel consumption, CO2 emissions and transport works of ship.

- **Ships > 5000 GT**
- **Regardless of Flag or Country of ownership**
- **Calling at an EU port from January 1st, 2018**
- **Carrying cargo or passengers for commercial purposes**

FUTURE LEGISLATION

EU shipping MRV regulation

Every ship must:

- **31/08/2017 : Develop a Monitoring Plan and verified by RO**
- **01/01/2018 : Start of 1st reporting period**
- **31/12/2018 : End of 1st reporting period**
- **30/04/2019 : Submission of verified Emissions report to EU & Flag State**
- **30/06/2019 : Issuance of Document of Compliance**

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FUTURE LEGISLATION

MARPOL Annex VI (Fuel Oil Data Collection)

Amendments to Chapt. 4 of MARPOL Annex VI were adopted during IMO MEPC 70 on 24-28/10/2016, which establish a new requirement:

- All ships of 5000 GT and above on international voyages to collect data related to fuel consumption.
- Beginning on **January 1st, 2019**, the following information is to be collected during the calendar year, from January 1 until December 31:

- Fuel consumption data for each type of fuel used onboard the ship (HFO, MGO, LNG, etc.)
- distance travelled while the ship is underway; and
- hours while the ship is underway.

FUTURE LEGISLATION

MARPOL Annex VI (Fuel Oil Data Collection)

- At the end of each calendar year, the collected data is required to be aggregated into annual values
- Reported by the shipowner to the ship's Flag Administration or Recognized Organization for
- Subsequent transmission to a central database managed by the IMO.
- After data submission and verification by, the Administration or the RO, a Statement of Compliance is to be issued within five months after the end of the year the data was collected.

FUTURE LEGISLATION

MARPOL Annex VI Regulation 14

- As of **January 1st, 2020** the sulphur content fuel oil used by ships globally is not to exceed 0.50% m/m.

- Nevertheless **u**nder the provisions of MARPOL Annex VI, Regulation 14, the availability of fuel oil to meet the global 0.50% sulphur limit in 2020 or 2025 is to be determined by the Committee by 2018.

THANK YOU!

Sustainable Development and eco energy concept