

Introduction to International Environmental Regulation in Shipping

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INTRODUCTION

General framework of international law

Pollution from ships has in general occurred in two principal ways: first, as a result of maritime accidents, which have sometimes caused large quantities of oil or chemicals to enter the sea; and second, through operational discharges of waste materials generated by ships, involving the release of pollutants in smaller but cumulatively significant amounts in the normal operation of ships.

Maritime regulations to prevent pollution from ships likewise fall into two broad categories, consisting of those concerned generally with ship safety standards, and those dealing specifically with measures to prevent and control pollution.

Before examining these regulations in detail some discussion is needed of how they are made within the framework of international law.

Under the UN Convention on the Law of the Sea 1982 (UNCLOS) the flag State bears the primary responsibility for exercising jurisdiction and control over ships on its register. This is partly because the flag State alone has jurisdiction over its vessels on the high seas, and partly because it is in a position to enforce standards by exercising control over the ships admitted to its registers and allowed to fly its flag.

States are required to take measures necessary to ensure the safety at sea of ships flying their flags.¹ Laws and regulations for the prevention, reduction and control of pollution of the marine environment must also be adopted by flag States, and may be adopted by coastal states to apply in their internal waters, territorial seas and exclusive economic zones.²

International rules and standards

As shipping is a global industry, the international community has long recognized that maritime regulation is best achieved by laws based on uniform international rules and standards.

Ship safety regulations have safety of life as their main purpose, though protection of the environment and preservation of property are also recognised as important objectives. The primary international instrument in this area is the Safety of Life at Sea Convention 1974 (SOLAS), together with the regulations and codes of practice which form part of its regime. Much of SOLAS is not concerned with preventing pollution, and a detailed review of its provisions is beyond the scope of this paper. However a summary is given of the Convention in view of the importance attached to ship safety regulation in the context of environmental protection.

The bulk of the paper is concerned with international regimes specifically directed at preventing pollution, chiefly the International Convention for the Prevention of Pollution from Ships (MARPOL). Much of MARPOL is concerned with the reduction of marine pollution resulting from discharges of waste materials, notably oily residues, but also including garbage, sewage, and smoke emissions. MARPOL also includes regulations designed to minimise the risk or extent of pollution from accidental causes, such as rules requiring construction of tankers with double hulls, or restricting the use of single-hull tankers for carriage of heavy grades of oil.

¹ United Nations Convention on the Law of the Sea (UNCLOS) Art. 94.

² Art. 211.

A brief account is also given of certain other environmental regulations affecting ships, notably those concerned with dumping at sea, export of waste and scrapping of ships, anti-fouling systems on ships 2001, and the control and management of ships' ballast water and sediments.

International Maritime Organisation

Most of the international regimes discussed in this paper have been agreed under the auspices of the International Maritime Organisation. The IMO is a United Nations agency which was established by an international convention adopted in 1948 and was known until 1982 as the Inter-governmental Maritime Consultative Organisation (IMCO).³ It has a substantial membership from the international community and is served by a secretariat at its headquarters in London, where its assemblies are held as well as regular meetings of its specialised committees.⁴

To facilitate the process of modifying regulations, to keep them in line with advances in technology and changing standards, the majority of IMO instruments now incorporate the so-called "tacit acceptance procedure", whereby a time limit may be set for contracting states to notify their acceptance or rejection of a proposed amendment, or to remain silent on the subject (in which case the amendment may be deemed accepted). This procedure has enabled both SOLAS and MARPOL to be amended on many occasions without undue delay. Revision of SOLAS is the function of the IMO's Maritime Safety Committee (MSC), whilst laws dealing with prevention of pollution, including amendments of MARPOL, fall within the remit of its Marine Environment Protection Committee (MEPC).

With the combined expertise at its disposal the IMO has unique technical, legal and political competence to devise agreed uniform standards of regulation to apply throughout the global shipping industry. Its authority has not always gone unchallenged, as states have sometimes come under domestic pressure to introduce unilateral measures which are more stringent, or enter into effect more speedily, than agreed international standards.⁵

Nonetheless, even states which have taken unilateral measures have continued to recognise the importance of international regulation to govern the world fleet, and reduce pollution of their coasts from passing maritime traffic. Such states have often proposed amendments of the international regimes, including some which are now important features of the regulations described in this paper.⁶

INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA (SOLAS)

Introduction

The main body of international law concerning ship safety standards is contained in the 1974 Convention for the Safety of Life at Sea (SOLAS).⁷ The purpose of the Convention was twofold: first, to consolidate existing international rules and standards into a single instrument; and second, to facilitate development of these rules and standards by prescribing a procedure for tacit acceptance of future amendments.

Over the years since 1974 a number of important maritime safety standards have been introduced within the framework of SOLAS. In modern times these have included for example the International Safety Management (ISM) Code and the International Ship and Port Facilities Security (ISPS) Code.

³ The 1948 Convention on the International Maritime Organisation. The Convention summarises the purposes of the IMO as being "to provide machinery for cooperation 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 maritime safety, efficiency of navigation and prevention and control of marine pollution from ships" (Art. 1(a)). The Organization is also empowered to deal with administrative and legal matters related to these purposes.

⁴ At the time of writing it has some 165 member states. It has entered into co-operation agreements with 36 intergovernmental organisations, and has granted consultative status to 63 non-governmental organisations.

⁵ Notable examples of this have been regulations introduced by the US Oil Pollution Act 1990 in response to the *Exxon Valdez* incident and regulations introduced in the European Community in relation to single-hull tankers following the *Erika* and *Prestige* incidents in 1999 and 2002 respectively.

⁶ For further details of the IMO and its work see www.imo.org.

⁷ The 1974 Convention was the fifth convention on the safety of life at sea. The first, of 1914, was prompted by lessons learnt from the *Titanic* disaster. Revised SOLAS Conventions were adopted in 1929, 1948 and 1960.

A full review of SOLAS is beyond the scope of this paper, but in view of the connection between maritime safety and protection of the environment a summary is given below of the main provisions of the Convention.

Scope of Convention

SOLAS is arranged in a series of chapters dealing with different aspects of maritime safety. Chapter I, *General Provisions*, defines the types of ships to which the Convention applies. It contains regulations on the issue of documents attesting compliance with the Convention, and it provides for the control of ships whilst in the ports of contracting states.

The following are the various aspects of ship safety addressed in the other Chapters of SOLAS.

Construction and sub-division

SOLAS Chapter II-1, *Construction, sub-division*, requires ships to be subdivided into watertight compartments to maintain stability and buoyancy in the event of hull damage. These provisions were first introduced in response to the *Titanic* disaster and are concerned mainly with passenger vessels. Requirements for bilge pumping and general stability are included as well as regulations relating to machinery and electrical installations, specifically to ensure that those essential for the safety of the ship and persons on board will function in an emergency. This Chapter also prohibits the use of any materials containing asbestos on board a ship.

Other international rules relating to the construction of ships, and concerned particularly with protection of the environment, include those requiring segregated ballast tanks and double hulls. These are contained in MARPOL and are discussed later in this paper.

Fire prevention, detection and extinction

Chapter II-2, *Fire prevention, fire detection and fire extinction*, includes detailed provisions on fire safety for all ships, together with more specific provisions for passenger ships, cargo ships and tankers. A number of serious fire casualties led to this Chapter being revised with effect from 1 July 2002. The revised Chapter makes mandatory the Fire Safety Systems (FSS) Code, which contains detailed specifications for fire safety systems.

Life saving appliances and arrangements

Chapter III, *Life saving appliances and arrangements*, sets out the International Life-Saving Appliance (LSA) Code, which establishes the standards with which all life-saving appliances and arrangements must comply. The LSA Code applies to all ships built on or after 1 July 1998.

Radiocommunications

Chapter IV, *Radiocommunications*, establishes the Global Maritime Distress and Safety System (GMDSS), which provides for ships to carry equipment designed to improve the chance of rescue following an accident at sea, for example satellite emergency position indicating radio beacons (EPIRBs) and search and rescue transponders (SARTs). This Chapter is closely linked to the Radio Regulations of the International Telecommunication Union and contains regulations requiring contracting States to provide adequate radiocommunication services.

Safety of navigation

Chapter V, *Safety of Navigation*, identifies safety services which should be provided by all contracting States and contains general operational provisions for applying to all ships.⁸ This chapter deals with meteorological services for ships, ship routing, ice patrol and search and rescue services, and it contains the regime of international law requiring contracting States to ensure that ships flying their flags are sufficiently manned. It also makes the carriage of voyage data recorders (VDRs) and automatic ship identification systems (AIS) mandatory for certain ships.⁹

⁸ These include vessels which are not governed by the other provisions of SOLAS because they fall outside the definition of the term "ship" in Chapter I.

⁹ Amendment effective 1 July 2002.

Carriage of cargoes

Chapter VI, *Carriage of cargoes*, includes regulations as to the stowage and securing of certain types of cargo and/or cargo units, for example containers, that present a potential hazard to ships or persons on board.

Carriage of dangerous goods

Chapter VII, *Carriage of dangerous goods*, includes provisions on the carriage of dangerous liquid chemicals or liquefied gases in bulk, and on the construction of ships to carry these cargoes; it also contains special requirements for the carriage of packaged irradiated nuclear fuel, plutonium and high-level radioactive wastes.

The Chapter requires the carriage of dangerous goods to comply with the relevant provisions of the International Maritime Dangerous Goods Code (IMDG Code).¹⁰ It also makes reference to other IMO Codes relating to specialised cargoes: the International Bulk Chemical Code (IBC Code), the International Gas Carrier Code (IGC Code) and the International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on Board Ships (INF Code).

Nuclear ships

Chapter VIII, *Nuclear ships*, sets out basic requirements for nuclear-powered ships, largely concerned with potential radiation hazards, and refers to the Code of Safety for Nuclear Merchant Ships.¹¹

Ship management

Chapter IX, *Management for the Safe Operation of Ships*, requires compliance with the International Safety Management (ISM) Code.¹² This requires shipowners, and any person who has assumed responsibility for a ship, to establish a safety management system.

High-speed craft

Chapter X, *Safety measures for high-speed craft*, makes the HSC Code (International Code of Safety for High-Speed Craft) mandatory for all high speed craft built on or after 1 January 1996. An amended version of the Code applies to all ships built on or after 1 July 2002.

Enhanced surveys

Chapter XI-1, *Special measures to enhance maritime safety*, contains provisions dealing with surveys of ships, ship identification, Port State Control and authorisation of organisations conducting surveys and inspections.

Maritime security

Chapter XI-2, *Special measures to enhance maritime security*, was adopted in response to the terrorist attacks in the United States on September 11, 2001.¹³ This Chapter introduced the International Ship and Port Facilities Security Code (ISPS Code).¹⁴ The Code requires governments to set security levels for ships flying their flags and to keep them informed of these levels. It also requires ships to comply with the security levels of a contracting State where the ship is in port or about to enter a port in the territory of that contracting State, where this security level is higher than that of the Flag state. Part A of the Code is mandatory; Part B is advisory and contains guidance on how best to comply with the mandatory provisions.

The regulations in this Chapter establish that in security situations the Master can exercise an overriding professional judgement;¹⁵ they also require all ships to be fitted with a ship security alert system, designed to

¹⁰ This requirement came into effect on 1 January 2004.

¹¹ Adopted by the IMO Assembly in 1981.

¹² Compliance has been mandatory since 1 July 1998.

¹³ Chap. XI was adopted in December 2002 and came into force on 1 July 2004.

¹⁴ Reg. XI-2/3.

¹⁵ Reg. XI-2/4.

advise the competent authority on shore of an emergency security situation without alerting those onboard the ship itself.¹⁶

Other regulations cover requirements for port facilities and their security plans, provision of information to IMO, the control of ships in port, and the specific responsibility of Companies.

Additional structural requirements for bulk carriers

Chapter XII, *Additional safety measures for bulk carriers*, includes various structural requirements for Bulk Carriers built after 1 July 1999, depending on the density of the cargo.

INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (MARPOL 73/78)

Introduction

During the first half of the twentieth century most seagoing steam and motor vessels deliberately discharged oil into the oceans as a part of routine ship operations. Tankers and other vessels carried seawater in cargo and bunker tanks to maintain stability on ballast voyages, and routinely discharged dirty ballast and oily residues from engine room bilges prior to entering port. A substantial amount of vessel-source pollution today still results from such intentional “operational” discharges.

The first substantial step taken by the maritime community to achieve an international solution to the problem of oil pollution was the 1954 International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL 54). OILPOL 54 was aimed primarily at reducing pollution resulting from operational discharges, in particular from routine deballasting and tank cleaning operations. The Convention was amended on a number of occasions in the 1960s, but by the early 1970s a new Convention was needed to bring regulations into line with modern tanker technology and operations.

MARPOL 73

This led to the International Conference on Marine Pollution in London in October 1973. The Conference produced the International Convention for the Prevention of Pollution from Ships (MARPOL 73), which was intended to establish a comprehensive regime resulting in the complete elimination of intentional pollution of the marine environment by oil and other harmful substances, as well as minimization of accidental discharges of such substances.

MARPOL 73 adopted many technical requirements, set forth in five annexes to the Convention. Annex I regulates operational discharges of oil and Annex II regulates pollution by noxious liquid substances in bulk. Both annexes were compulsory for states adopting MARPOL 73. Annexes III, IV and V are so-called “optional annexes” which any state may voluntarily accept or decline. Annex III contains regulations for the prevention of pollution by harmful substances carried in packaged forms Annex IV contains regulations for the prevention of pollution by sewage from ships and Annex V sets forth regulations for the prevention of pollution by garbage from ships. MARPOL 73 also contained protocols for reports on incidents involving harmful substances and arbitration procedures.

MARPOL 78

The mandatory technical requirements of MARPOL 73, particularly with regard to shore reception facilities for both oil and chemical tankers, and the high cost of implementing these requirements prevented MARPOL 73 from entering into force. IMCO therefore convened a second International Conference on Tanker Safety and Pollution Prevention in 1978 to correct a number of the deficiencies in MARPOL 73. The resulting treaty is generally referred to as MARPOL 73/78.¹⁷

¹⁶ Reg. XI-2/5.

¹⁷ Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973, reprinted in 17 I.L.M. 546 (1978).

The 1978 Protocol provided that the Protocol and MARPOL 73 could be interpreted as one single instrument, permitting a state to ratify the Protocol and thereby become a party to the 1973 Convention, as amended by the Protocol. A second change in Article II permitted contracting states to delay implementation of Annex II for three years from the date of entry into force of the Protocol, thus allowing time for the development of adequate reception facilities and other measures necessary for compliance with Annex II requirements.

The 1978 Protocol also made a number of substantive changes to Annex I to clarify and strengthen survey and inspection requirements, and to require more frequent certification inspections for issuance of the International Oil Pollution Prevention Certificate.

Annexes II-V of MARPOL 73 were adopted without change by the 1978 Protocol, and remain in effect. Despite ratification problems stemming from the high costs of implementing the structural and operational requirements, the treaty came into force in October 1983.

Over the years MARPOL has been modified on a number of occasions, normally to introduce new or improved standards of regulation in the light of experience or of advances in technology. One of these amendments, adopted in 1997, involved the addition of a new Annex, Annex VI, to deal with air pollution from ships.

The following is a brief summary of the main features of the regulations in these six Annexes to MARPOL.

Prevention of pollution by oil (MARPOL Annex I)

Annex I contains the MARPOL regulations for prevention of pollution by oil. It is beyond the scope of this paper to go into these in full detail, but they include among other things –

- The controls which regulate operational discharges, such as minimum distance from land, degree of dilution and rate of discharge; also special rules for “special areas,” where ships are required to retain all dirty ballast and tank washing residues, and to discharge only to reception facilities.
- Requirements for ships to have in operation an oil discharge monitoring and control system, oily water separating equipment, or oil filtering system.
- The obligation on governments to undertake to ensure the availability of reception facilities for the discharge of oil residues and oily wastes.
- Requirements for ships to be fitted with segregated ballast tanks.
- The issue to ships of an International Oil Pollution Prevention Certificate, attesting compliance with these regulations.
- Rules for newly built tankers, and those carrying cargoes of heavy fuel oil, to be constructed with double hulls; and for single hull tankers to be phased out.
- Requirements for ships to carry on board a shipboard oil pollution emergency plan (SOPEP) approved by the flag state, and an oil record book.

Control of pollution by noxious liquid substances in bulk (MARPOL Annex II)

Annex II applies to all ships carrying “noxious substances” in bulk. These substances are divided into four categories (A, B, C, D) depending on the level of hazard to marine resources and human health and are listed in an appendix to Annex II. The discharge of Category A substances (representing a major hazard) is prohibited, and limitations are placed on the discharge of ballast water and tank residues containing such substances both within and outside special areas (Baltic and Black Seas). Limitations are also placed on the discharge of Category B, C and D substances, and control measures established for tank cleaning and transfer operations. The regulations further require all loading, unloading, transfer, ballasting and cleaning operations and all discharges to be recorded in a cargo record book. Annex II requires that ballast water, tank washing residues and other mixtures containing any noxious substances be discharged only at shore reception facilities unless the concentrations can be diluted to acceptable levels.

Prevention of pollution by harmful substances carried in packaged forms (MARPOL Annex III)

Annex III contains regulations for the prevention of pollution by harmful substances carried in packaged forms. The government of each contracting state must issue detailed requirements on packing, marking, labelling, documentation, stowage, quantity limitations and exceptions for preventing or minimizing pollution of the marine environment by harmful substances.

Annex III establishes a general requirement that packages be adequate to minimize the hazard to the marine environment. Packages containing harmful substances must be durably marked with the correct technical name and must be labelled to indicate that the substance is a marine pollutant. Shipping documents must identify such substances as marine pollutants and must be accompanied by a shipper's declaration that the shipment offered for carriage is properly packaged and labelled. Vessels carrying harmful substances must have a special list or manifest setting forth the harmful substances on board and their location. Harmful substances must be properly stowed and secured so as to minimize the hazards to the marine environment without impairing the safety of the ship. The regulations prohibit the jettisoning of harmful substances carried in packaged form, except where necessary for the purpose of securing the safety of the ship or saving life at sea, and require appropriate measures to be taken to regulate the discharge of any leakages overboard. Ships are subject to port state inspections and each contracting state has authority to detain vessels which are not in compliance with Annex III requirements.

Prevention of pollution by sewage from ships (MARPOL Annex IV)

Annex IV contains regulations for the prevention of pollution by sewage from ships. While Annex IV reflects international practice, it has not yet officially come into force. Sewage is defined to mean drainage and other wastes from any form of WC, medical premises, spaces containing living animals, and other waste waters. Annex IV establishes survey requirements to insure that vessels subject to regulation are equipped with sewage treatment plants, approved disinfectant systems and holding tanks, and a pipeline for the discharge of sewage to a reception facility. Vessels which are in compliance with the regulations after survey are issued an International Sewage Pollution Prevention Certificate by the flag administration.

Annex IV prohibits the discharge of sewage into the sea except when the ship is discharging comminuted and disinfected sewage using an approved system at a distance of more than four nautical miles from the nearest land, or sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land the ship has in operation an approved sewage treatment plant or the ship is in waters under the jurisdiction of a state which has less stringent discharge requirements. Exceptions from the discharge limitations are made for the purpose of securing the safety of the ship or saving life or where the discharge is the result of accidental damage to the vessel. Regulation 10 requires each contracting state to undertake to insure the provision of shore reception facilities.

Prevention of pollution by garbage from ships (MARPOL Annex V)

Annex V contains regulations for the prevention of pollution by garbage from ships. Annex V applies to all vessels to which MARPOL is applicable. Subject to special requirements, the regulations prohibit the disposal at sea of all plastics, including synthetic ropes, fishing nets, and plastic garbage bags. The disposal of other garbage must be made as far as practicable from the nearest land. Prohibitions are established on the disposal of dunnage, lining and floatable packing materials within 25 nautical miles of land, and the disposal of other garbage including paper products, rags, glass, metal, bottles, crockery and other refuse within 12 nautical miles of land. Garbage other than dunnage, lining and packing materials may be disposed of at a minimum distance of three nautical miles from the nearest land if the garbage is capable of passing through a screen with openings no greater than 25 millimetres. Special rules govern the disposal of garbage from fixed or floating offshore oil or gas platforms, and within special areas which include the Mediterranean Sea, Baltic Sea, Black Sea, Red Sea, North Sea and Persian Gulf area. Annex V requires contracting states to provide shore reception facilities, and provides for notification of all concerned parties where such facilities are alleged to be inadequate. Regulation 8 now authorizes port states to inspect vessels when there are "clear grounds for believing that the master and crew are not familiar with essential shipboard procedures relating to the prevention of pollution by garbage".

Prevention of air pollution from ships (MARPOL Annex VI)

On 26 September 1997, the IMO adopted the Protocol of 1997 amending MARPOL 73/78 to add Annex VI, entitled “Regulations for the Prevention of Air Pollution from Ships”. The Annex entered into force on 19 May 2005.

Annex VI is the culmination of IMO efforts to establish a policy on the prevention of air pollution from vessels as well as to contribute to the reduction of air pollution on the global level. It establishes a system of surveys and inspections to ensure that vessel equipment and material comply with the requirements of the annex and are in good working order. Regulation 6 provides for the issuance of an International Air Pollution Prevention Certificate after survey to any ship of 400 gross tons or more engaged in voyages to ports or offshore terminals under the jurisdiction of signatory states. Certificates are issued for periods of up to five years provided inspections and surveys are carried out within the specified periods and no significant alterations have been made to the required equipment, systems, fittings, arrangements, or material without the express approval of the flag administration. New certificates must be issued upon transfer of the vessel to the flag of another state. Regulation 10 permits port states to detain vessels “where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of air pollution from ships”. Regulation 11 outlines procedures for the detection of violations and enforcement of the provisions of the annex.

Annex VI establishes detailed requirements for the control of emissions from ships. These requirements cover four general types of emissions:

- (1) ozone depleting substances;
- (2) nitrogen oxides (NO_x);
- (3) sulphur oxides (SO_x); and
- (4) volatile organic compounds (VOCs).

The requirements do not apply to emissions necessary to secure the safety of the ship or to save lives at sea, or to emissions resulting from damage to the ship or its equipment, providing reasonable precautions were taken to prevent the emissions after discovery of the damage.

Proposed amendment of MARPOL ANNEX VI: Recent developments arising from the 57th Session of the Marine Environment Protection Committee (MEPC) between 31 March -4 April 2008

The recent MEPC.57 session progress was made in preparing significant amendments to MARPOL Annex VI as well as a revised version of the Nitrogen Oxide (NO_x) Technical Code (given rise to the “NO_x Technical Code 2008”). The proposed amendments to Annex VI include a progressive reduction in Sulphur Oxide (SO_x) emissions from ships as follows:

- A reduction in the global sulphur cap from 4.50% to 3.50% from January 2012 and progressively to 0.50% effective from January 2020.
- A reduction in the sulphur limitation applicable in Sulphur Emission Control Areas to 1.00% from March 2010; this would subsequently be reduced to 0.10% from January 2015.

Progressive reductions in NO_x emissions from marine engines were also agreed with the introduction of a new ‘three tier’ system which sets progressively tighter NO_x emission standards depending on the date of engine installation. The most stringent standards apply to ‘Tier III’ engines (those installed on ships constructed on or after 1 January 2016 operating in Emission control Areas).

Amendments to the NO_x Technical Code were also approved during MEPC.57. The NO_x Technical Code 2008 will now include provisions for direct measurement and monitoring methods, a certification procedure for existing engines and test cycles to be applied to Tier II and Tier III engines.

It is anticipated that these proposed amendments to Annex VI and the NO_x Technical Code will be submitted to MEPC.58 (to be held between 6-10 October 2008) for formal adoption. The revised Annex VI would then enter into force in 2010.

Greenhouse Gas Emissions from ships: Recent developments

Another topical issue, also discussed during MEPC.57, concerns proposed measures to reduce Greenhouse Gas Emissions (GHG) from ships. For ease of reference, a brief background to this issue of GHG emissions is set out below.

The United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC was adopted in 1992, entered into force in March 1994 and has been ratified by over 190 countries. The Convention sets out basic principles and provides general framework for inter-governmental action to address the challenge posed by climate change. Under the Convention, Governments are encouraged to stabilise GHG emissions. They are also to gather and share information, national policies and best practices as well as launch appropriate strategies. Governments are also expected to provide financial and technological support to developing countries in certain circumstances and cooperate in preparing for adaption to the impacts of climate change.

The Kyoto Protocol

The Kyoto Protocol supplements the UNFCCC and entered into force in 2005 following ratification by Russia. Although the Protocol has been ratified by numerous countries, there are some notable exceptions (such as the United States which has signed, but not ratified, the Protocol). The Kyoto Protocol differs from the UNFCCC in that it *commits*, (as opposed to *encourages*) developed countries to reducing their GHG emissions below specified levels. Countries are obliged to comply with the requirements within a timeframe of 5 years between 2008 and 2012, the so-called “commitment period”. Under the Protocol, ‘Annex I’ countries (i.e. ‘developed’ nations) have a heavier burden. The rationale for this is that these countries are more easily able to pay for the cost of cutting emissions and have, historically, contributed to the problem by emitting greater amounts of GHGs per person than developing countries. These Annex I countries are required to reduce their overall GHG emissions by an average of 5.2% below their 1990 level within the ‘commitment period’. The targets in question cover emissions of the 6 main GHGs which are carbon dioxide (CO²), methane (CH⁴), nitrous oxide (N²O), hydro fluorocarbons (HFCs), per fluorocarbons (PFCs) and sulphur hexafluoride (SF⁶). Each party has an assigned maximum emission for the ‘commitment period’. Within the EU there is a target of -8% which will be redistributed under a “bubble” scheme under which EU countries have individual targets that, when combined, form an overall target for that group of countries. The EU has already decided how these targets will be redistributed.

There are three key mechanisms under the Protocol which have been developed to assist countries meet their respective targets:

1. **Emissions Trading (ET) – Art 17:** This allows parties to acquire units from other parties and use them towards meeting their emission targets under the Kyoto Protocol thereby enabling parties to lower the overall cost of reducing emissions. Transfers and acquisitions of the units in question are tracked and recorded through registry systems including a ‘national registry’ which is established and maintained by each party. Parties can also authorise legal entities (such a business, NGOs and other entities) to participate in emissions trading under their authority.
2. **Joint Implementation (JI) – Art 6:** This is a project-based mechanism which allows parties to invest in eligible projects other Annex I countries and count the resulting Emission Reduction Units towards meeting their own Kyoto targets.
3. **Clean Development Mechanism (CDM) – Art 12:** This mechanism allows Annex I parties to invest in eligible projects in non Annex I countries that reduce emissions in those countries in return for Certified Emission Reductions (CERs). The CERs generated can be used by Annex I parties to help meet their emissions targets under the Kyoto Protocol

It will be appreciated therefore that these market-based mechanisms allow developed countries to earn and trade emissions credits through projects implemented either in other developed countries or in developing countries which they can use towards meeting their commitments.

Bali Climate Change Conference

As the Kyoto Protocol 'commitment period' will expire in 2012 it is important that a new framework is negotiated to address the issue of GHGs after that date. This was a key objective of the Bali Climate Change Conference which took place in December 2007 with delegates attending from over 180 nations. The Bali conference culminated in the adoption of the "Bali Roadmap" which includes a "Bali action plan" with provision for a new negotiating process to address climate change; this is due to be completed by 2009.

GHG emissions: Decisions arising from the 57th Session of the Marine Environment Protection Committee (MEPC) between 31 March -4 April 2008

The IMO has also been involved in the challenge of reducing greenhouse gas emissions. In 2003 the IMO adopted a resolution entitled *IMO policies and practices related to the reduction of greenhouse gas emissions from ships*. Under the resolution, the Assembly had urged MEPC to identify and develop the necessary mechanisms needed to achieve the limitation or reduction of GHG emissions from international shipping. The climate change challenge was therefore an important topic on the MEPC Agenda at the 57th session in April 2008.

At MEPC.57, the IMO Secretary-General's proposal to expedite the IMO's work on GHG emissions was endorsed by the MEPC, in particular in relation to developing the CO² (Carbon Dioxide) Emission Indexing Scheme and the CO² Emission baseline(s). In this regard it should be noted that the IMO has been actively engaged in developing a GHG indexing system for ships which would enable ship owners to evaluate the performance of their fleet with regards to CO² emissions. As the amount of CO² omitted from a ship is directly related to the consumption of bunker fuel oil, CO² indexing also provides useful information on a ship's fuel efficiency.

The MEPC discussed and agreed upon the practical next steps proposed by the GHG Working Group in relation to the development of long and short term measures to address CO² emissions from ships. Short term measures included a proposal to establish a global levy scheme on marine bunker fuel and the improvement of specific fuel consumption. Longer term goals included the use of alternative fuels and technical measures for ship design.

There is a intersessional meeting of the Working Group on GHG Emissions from Ships scheduled to take place in Norway in June 2008. The meeting will address market-based, operational and technical measures identified by the MEPC Working Group on GHG related issues and will submit a written report to MEPC.58. It is intended that the work on GHG emissions should be completed by 2009, in order that the IMO can submit a position paper to the Climate Conference in Copenhagen (which will take place in November/December 2009). The Copenhagen Conference is significant in that it will be the final meeting of the UNFCCC parties at a governmental level before a renewal of the future framework is agreed.

DUMPING AT SEA

The law of dumping at sea is discussed here in the context of maritime casualties. These are not the primary focus of the law on this subject, which in general is less concerned with the regulation of shipping than with the control of marine pollution from land-based sources of waste. The usual issue is whether the waste generated by activities on land should be disposed of on land, or whether a permit should be granted for it to be shipped to a designated dumping site at sea. The principles governing the grant or refusal of such a permit affect mainly those concerned with the disposal of the waste, and are of relatively less importance to shipowners engaged to carry and dump it if a permit is given.

Nonetheless these laws may come into play if a ship or its cargo loses its commercial value as a result of events during a voyage, and if dumping is considered as the most practical method of their disposal. Questions may then need to be considered as to whether dumping is controlled by any applicable legal regime; whether it would be prohibited or a permit would be available; and as to any conditions that might be imposed.

The main sources of international law on this subject are the London Dumping Convention 1972 (LDC), and the LDC Protocol of 1996. The Convention came into effect in 1975 and has widespread force around the world. The Protocol came into effect in March 2006 in 26 states. In those states it significantly amends the regime set out in the Convention.

Contracting States to LDC agree to take all practicable steps to prevent the pollution of the sea by the deliberate dumping of waste and other matter that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea. To this end they agree to take measures to prevent pollution by giving effect to the controls set out in the Convention.

The Convention operates by prohibiting the dumping of certain types of waste – those on a “black list” of materials – whilst permitting the dumping of other materials on certain conditions, including the grant of an official permit. LDC is predominantly concerned with the disposal at sea of land-based waste, and practical difficulties have sometimes been experienced in applying the regime to the disposal of distressed ships or cargoes after a casualty at sea.

In the context of a maritime casualty the first issue is whether the case falls within the scope of application of the Convention. This depends on whether any dumping of waste is involved within the meaning of the Convention (i.e. whether the sinking of a ship or its cargo constitutes a disposal of waste to which the regime applies), and, if so, on whether it falls within the jurisdiction of one or more Contracting States. An important element in the definition of dumping is that the disposal has to be “deliberate” – an accidental sinking falls outside the scope of the Convention.

If the Convention applies, dumping may in some cases be wholly prohibited and others be permissible with a prior permit from the competent authority. Factors are prescribed to be taken into account in determining whether to issue a permit, the refusal of which will normally mean either that the vessel must be taken to some other location or that she must be disposed of ashore. The controls will not apply in stipulated cases of *force majeure* and may be relaxed in others involving an emergency. Questions may arise as to the appropriate authority to which application should be made for a permit, and also as to the sanctions or other consequences to be anticipated if dumping occurs in breach of the Convention.

The LDC Protocol adopts tougher restrictions which prohibit the dumping of any wastes or other matter with the exception of those listed in Annex 1. These include dredged material; sewage sludge; fish waste; inert, inorganic geological material; organic material of natural origin; and vessels, platforms or other man-made structures at sea.

Even where dumping is not prohibited, the Protocol requires the so-called “precautionary approach”. This requires that “appropriate preventative measures are taken when there is reason to believe that wastes or other matter introduced into the marine environment are likely to cause harm even when there is no conclusive evidence to prove a causal relation between inputs and their effects.”

EXPORT OF WASTE AND SCRAPPING OF SHIPS

A separate category of regulation from dumping at sea is concerned with laws to control export of waste for land-based disposal in countries other than those where it was originally produced.

The principal mischief addressed by these laws lies less in hazards associated with the transport of the waste – though these may also be relevant – than in the concern that in some countries, particularly developing nations, the methods of disposal may be unsafe or environmentally unsound. International regulation owes much to a policy of preventing the perceived exploitation of such nations by commercial interests in industrialised countries where the waste was generated.

The principal international regime in this field is established by the Basel Convention 1989, made under the auspices of the OECD, and, in some of its contracting states, by an amendment known as the Basel Ban. Other relevant regulations are contained in various bi-lateral, multi-lateral and regional agreements. These include the multi-lateral arrangement of the OECD Council Decision of 2002 and the regional African agreement, the Bamako Convention 1998. The number of parties to the Basel Convention has risen to 168 and includes all European Community and OECD member states. The only major industrial nation not bound by the Basel Convention is the United States.¹⁸

¹⁸ In 1995 the US announced it would ratify the Basel Convention but reserved the right to ship “recyclable” materials. In practice, as most waste can potentially be recycled, this reservation does not show a clear commitment to the spirit of the Basel Convention.

The aims of the Basel Convention are to prevent and minimise hazardous waste generation and encourage disposal in the State where it is generated, ensuring that any transboundary movements are not harmful to the environment or a threat to human health. The parties finally agreed on a text where the emphasis was placed on the ‘control’ of shipments by providing a global system in the prevention of undesirable traffic in hazardous and other wastes, as opposed to outright prohibition. Control is achieved through a Prior Informed Consent procedure (PIC). However, this has proved to be unsatisfactory for many countries, there has been a move towards prohibition of transboundary movements of waste from developed to developing world countries.

The relevant controls have affected shipping in three principal ways.

First, the operators of ships carrying cargoes regarded as ‘waste’ may incur serious delays and expense in the event of any dispute as to the export of the waste from the country of origin, or its entry into the intended country of import. Indeed, disputes of this nature have occurred even after the necessary permits had been obtained.

Second, the disposal ashore of wastes generated in the operation of a ship may in some circumstances fall within these controls. A problem of this kind arose last year when waste from the slops tanks of the tanker *Probo Koala* was discharged in Abidjan, Ivory Coast, for disposal in local reception facilities. The waste included chemicals which required proper disposal, but the local contractors dumped it improperly with serious health consequences for people living nearby. The regulations exempt waste generated in the “normal” operation of a ship and there was some uncertainty as to whether this was the case in this instance.

Third, as in the case of dumping at sea, the notion of ‘waste’ may include derelict ships as well as cargoes or other materials on board. When ships are to be scrapped – whether due to their age, obsolete design, a casualty, or for any other reason – there is an argument that they then become waste, and that their delivery for demolition in some of the traditional shipbreaking countries should be restricted or prohibited by the laws discussed in this paper. This is particularly the case if residues of toxic material remaining on board, or other characteristics of the ship, result in it being regarded as ‘hazardous’ waste.

Growing awareness of the issues relating to scrapping of ships has led to this becoming a growth area in recent times. There are different views as to whether the Basel Convention actually applies to scrapping of ships, but at all events it is clear that if it does so then there are a number of complications which the Convention does not address. It could also have seriously adverse effects on a long established industry in traditional shipbreaking nations. For these reasons a draft Convention on recycling of ships is under consideration at the IMO, with the aim of making it clear that ship scrapping falls outside the ambit of the Basel Convention and is governed instead by its own specialised regime. It is expected that the draft Convention will be adopted in the autumn of 2009.

INTERNATIONAL CONVENTION ON THE CONTROL OF ANTI-FOULING SYSTEMS ON SHIPS

Background – Anti-Fouling systems

“Anti-fouling systems”, defined in the Convention as “a coating, paint, surface treatment, surface or device that is used on a ship to control or prevent attachment of unwanted organisms”, are commonly used to coat the bottoms of ships. Their purpose is to prevent sealife such as algae, barnacles and molluscs attaching themselves to the hull, which might slow the ships and increase fuel consumption. They achieve this by producing compounds designed to gradually enter (or “leach” into) the surrounding sea water. During the 1970s and 1980s however studies showed that these compounds persist in the water, killing sea life beyond that attached to the ship, harming the environment and possibly entering the food chain.

One of the most effective and commonly used anti-fouling paints, developed in the 1960s, contains the organotin tributyltin (TBT) which has been proven to cause deformations in oysters and sex changes in whelks.

In view of the harmful environmental effects of organotin compounds the IMO’s Marine Environment Protection Committee (MEPC) adopted a resolution in 1990 recommending Governments take steps to restrict the use of anti-fouling paint containing TBT. Subsequently, the IMO adopted an Assembly resolution that called on the MEPC to develop an instrument, legally binding throughout the world, to address the harmful effects of anti-

fouling systems used on ships.¹⁹ The resolution called for a global prohibition on the application of organotin compounds acting as biocides in anti-fouling systems on ships by 1st January 2003, and a complete prohibition by 1st January 2008. This instrument was adopted as the International Convention on the Control of Harmful Anti-fouling Systems on Ships.²⁰

INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS

Background

For many years it has been known that ships which take on ballast water in one part of the world and then discharge it in another may in the process also transfer species of marine life that can prove ecologically harmful when released into a non-native environment. This problem has increased in modern recent times, in line with growth in the volume of trade and the shipping traffic. It is now estimated that between 3 and 10 billion tonnes of ballast water are transferred globally each year, and it is recognised that the introduction and spread of these 'invasive species' have had significant effects in many areas of the world.²¹

The IMO first considered taking action to address this problem in 1988. In the 1990s it developed a number of guidelines on the subject,²² and in 2004 it adopted the International Convention for the Control and Management of Ships' Ballast Water and Sediments. The Convention will enter into force 12 months after ratification by 30 States, representing 35 per cent of world merchant shipping tonnage²³. The Convention itself is made up of Articles setting out the terms of the convention and the obligations of the parties, and an Annex that sets out the technical standards and requirements, as detailed in the Regulations, for the control and management of ships' ballast water and sediments.

EUROPEAN LAW: EU DIRECTIVE ON CRIMINAL SANCTIONS FOR SHIP-SOURCE POLLUTION

An important issue which has arisen in modern times concerns the relationship between global regulation under the auspices of the IMO and regional laws such as those developed in Europe. This issue has been brought to a head by measures taken in the EU in response to the *Erika* and *Prestige* oil spills in 1999 and 2002, and in particular by the EU Directive of September 2005 on Criminal Sanctions for Ship-source Pollution.

Background

MARPOL differentiates between pollution resulting from deliberate "operational" discharges from ships and spills resulting from genuine accidents. Operational discharges involve deliberate releases of oil in circumstances which may or may not be permissible under international law. MARPOL recognises that ships accumulate oily wastes

¹⁹ Resolution of 25th November 1990.

²⁰ This instrument was adopted on 5 October 2001. The International community had also called for action on the pollution caused by organotins compounds used in anti-fouling systems in the 1992 Rio Conference on Environment and Development. Chapter 17 of Agenda 21 called on States to take measures to reduce this form of pollution.

²¹ Specific examples include the introduction of the European zebra mussel (*Dreissena polymorpha*) in the Great Lakes between Canada and the United States, resulting in expenses of billions of dollars for pollution control and cleaning of fouled underwater structures and waterpipes; and the introduction of the American comb jelly (*Mnemiopsis leidyi*) to the Black and Azov Seas, causing the near extinction of anchovy and sprat fisheries.

²² In 1991 the MEPC adopted MEPC resolution 50(31) - Guidelines for Preventing the Introduction of Unwanted Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges; while the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992, recognized the issue as a major international concern.

In November 1993, the IMO Assembly adopted resolution A.774(18) - Guidelines for Preventing the Introduction of Unwanted Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges, based on the Guidelines adopted in 1991. The resolution requested the MEPC and the MSC to keep the Guidelines under review with a view to developing internationally applicable, legally-binding provisions.

The 20th Assembly of IMO in November 1997 adopted resolution A.868(20) - Guidelines for the control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens.

²³ Article 18.

which need to be removed from the vessel, and it encourages States to install reception facilities enabling this to be done ashore. It also recognises that there are many ports where reception facilities are not available. It therefore allows oily wastes to be discharged into the sea provided certain stringent conditions are met, relating to such matters as the distance from land, the oil content of the effluent, the rate of discharge, and protection of special areas. Operational discharges which contravene these restrictions are violations of international law, and contracting states are required to impose penalties on offenders which are adequate in severity to discourage them.

Accidental discharges, on the other hand, raise different issues and are treated differently in MARPOL. A discharge does not constitute a breach of international law when it results from damage to a ship or its equipment. In such a case a violation of MARPOL is committed only if there has been a failure to act reasonably to minimize damage after discovering the discharge, or if the owner or the master acted either with intent to cause damage, or recklessly and with knowledge that damage would probably result. This principle is set out in MARPOL Annex I Regulation 11(b) in relation to oil pollution (and in Annex II Regulation 6(b) in relation to pollution by noxious liquid substances).

There should accordingly be no criminal implications involved where pollution results from a shipping casualty caused, for example, by negligence in the management or navigation of the ship, or of another ship with which it collides, or from negligence of pilots, port authorities, or other parties.

MARPOL entered into force in 1983 and applies in all EU member states as well as in many other states around the world. After the *Prestige* incident there was great political pressure in Europe to introduce new measures. In some instances the action taken was to instigate MARPOL amendments, such as those relating to double hulls. In the case of criminal liability, however, the European legislators decided to ignore the MARPOL amendment procedure, and felt it important to be seen to introduce their own measures.

A draft of the Ship-source Pollution Directive was first published in March 2003, less than four months after the *Prestige* sank. A subsequent Report of the European Parliament expressed a number of legal objections to the draft: whilst professing to give effect to MARPOL, it in fact conflicted with the Convention by imposing criminal liability for accidental discharges in circumstances where there would be no offence in international law. In particular it would alter the effect of Reg. 11(b) by making it unavailable where the discharge resulted from the defendant's "serious negligence".

The notion of "serious negligence" is not a legally established concept, but is uncertain and prone to mislead. In the Directive it is unaccompanied by any criteria or guidance as to what it is intended to mean. Experience shows that in a significant oil spill there is a risk of subjective elements impinging on the decision to prosecute, as the seriousness of alleged negligence may all too readily be judged by the consequences of the incident rather than the culpability of the defendant's actions.

The Parliamentary Report noted that the meaning of this phrase was uncertain, and that there were various respects in which the proposed Directive was unclear.

These criticisms reflected widespread concerns about the draft Directive which were voiced by several industry bodies, by speakers at international conferences and seminars, and by Governments. However these objections were substantially overruled in the subsequent political process. Despite opposition from Greece, Malta and Cyprus the EU Directive 2005/35/EC of 7 September 2005 on Ship-source Pollution and on the Introduction of Penalties for Infringements was published on 30 September 2005 and came into effect the following day.

In its final form the Directive remains controversial for much the same reasons as those expressed ever since the first draft. The essence of the controversy was highlighted at the Eighth Annual Cadwallader Memorial Lecture in London on 4 October 2005 when the eminent jurist Dr. Thomas Mensah, a recently retired judge and former presiding judge of the Law of the Sea Tribunal in Hamburg, gave a public lecture expressly the view that the Directive does not conform with international law.

Intertanko and Others vs. Department for Transport

Proceedings to test the validity of the Directive have been brought jointly by a coalition of industry bodies consisting of INTERTANKO, INTERCARGO, the Greek Shipping Co-operation Committee, Lloyd's Register and the International Salvage Union.

On 23 December 2005, with INTERTANKO as lead claimant, the coalition filed an application for judicial review in the Administrative Court of the High Court of Justice in London. The coalition contended that it was appropriate for the European Court of Justice (ECJ) in Luxembourg to consider the validity of this Directive. It therefore invited the High Court to refer the matter to the ECJ for a ruling. The proceedings name as Defendant the Secretary of State for the Department for Transport.

Previous rulings of the ECJ have established that EU legislation cannot validly put member states in breach of existing treaty obligations. The coalition contends that implementation of the Directive would have this effect as MARPOL imposes a treaty obligation to legislate in accordance with the regulations set out in Annexes I and II to the Convention. All EU members states are parties to MARPOL and must therefore adhere to the provisions of these Annexes.

For technical reasons the coalition does not have direct access to the ECJ, but the issue could be referred to it for a preliminary ruling in proceedings brought in the courts of a member state. The High Court in London was chosen as the route to the ECJ partly because the coalition members all have offices in the UK, and partly because there is established precedent for similar cases being referred to the ECJ by the courts in London. Previous cases have established that the High Court is prepared to refer issues to Luxembourg in proceedings for judicial review of EU law without waiting for implementing legislation to be introduced in the UK.

Against the background of the *Prestige* incident and other cases involving the detention of seafarers, the applicants believe that the Directive already has had a detrimental effect on the morale of seamen, and that this will have adverse implications for the retention and recruitment of high quality crews.

The Coalition believes it is important to establish the bounds of EU law and to clarify the relationship between EU legislation and global international laws.

The case was heard by the High Court in the summer of 2006, and in its ruling it held that the coalition had established well founded arguments which merited the attention of the ECJ. It drew up four preliminary questions which were referred to Luxembourg and heard by the Grand Chamber of the European Court of Justice in September 2007.

The Opinion of Advocate General Mme Julianne Kokott was delivered 20 November 2007. The Opinion examined the arguments presented by the parties to the case, and made recommendations as to how the legal issues can be addressed. However it is not binding on the Court, and its judgment is awaited.

In brief, the Advocate General has supported the Coalition's argument that the Community has no power to apply laws that go beyond MARPOL outside the territorial seas. She further acknowledged that the Directive was intended to do this, as it introduces "serious negligence" as an additional test of liability. She has suggested, however, that the Directive would not be invalid if the term "serious negligence" is interpreted restrictively in the EEZ, so as to have the same meaning as the test of recklessness in MARPOL. She has also proposed that that this restricted interpretation should not apply in the territorial sea where she concludes that the Community has greater freedom of action, and where she recommends that "serious negligence" should be given a broader meaning. It remains to be seen whether the Court decides to adopt this dual interpretation of the term in different parts of the sea.