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The International Legal Framework for Prevention of Vessel-source Pollution and Its Implementation in Chinese Legislation

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Contents

Summary

Vessel-source pollution is regarded as one of the major sources that harm marine environment. It has become an issue of public concern since 20th century due to a series of oil pollution incidents on the sea. Fortunately, international law has been developed to control this source of pollution taking consideration of the importance of protection and preservation of marine environment and sustainable development of society.

This thesis focuses on the international legal framework for prevention of vessel-source pollution. Both public and regulatory international law regarding prevention of vessel-source pollution is discussed within the framework. Three main conventions, namely United Nations Convention on the Law of the Sea, 1982, International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969, and International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol, are discussed by analyzing selected articles in each convention. In order to provide a better understanding of the implementation of international maritime law, China's national legislation regarding vessel-source control is also examined. Two important pieces of legislation: Marine Environment Protection Law and Regulations on the Prevention and Control of Vessel-source Pollution of the Marine Environment are discussed in a contextual detail.

The categories of marine pollution and vessel-source pollution are introduced at the beginning with a special focus on vessel-source pollution. Then international legal framework is presented by detailed analyse of the major international instruments mentioned above. Then vessel-source pollution law in China is carefully examined. Finally, a summary together with conclusions are presented.

KEYWORDS: vessel-source pollution, marine environment protection, the 1982 UNCLOS, Intervention, MARPOL 73/78 Annex II, the 2000 MEPL, the 2009 Regulation.

Abbreviations

EEZ	Exclusive Economic Zone
GT	Gross Tonnage
IMO	International Maritime Organization
IMCO	Inter-Governmental Maritime Consultative Organization
ITOPF	International Tanker Owners Pollution Federation
IBC Code	International Bulk Chemical Code
MEPC	Marine Environment Protection Committee
MEPL	Marine Environment Protection Law
MSA	Maritime Safety Administration of People's Republic of China
NLS	Noxious Liquid Substances
ppm	ml/ m^3
UNEP	United Nations Environmental Programme

1 Introduction

1.1 Backgound

Protection of the marine environment is a current and contemporary issue, the importance of which is not likely to diminish in the near future. It is not only because the oceans are fragile and susceptible to damage but also due to the dependence of human society on the marine environment. The pollution of the marine environment threatens many interests of society in various aspects ranging from existence to recreation. From a macroeconomic standpoint, marine pollution affects the living environment of man. As part of the integrated ecosystem, the marine ecosystem is directly related to the land terrestrial ecosystems and therefore influences the whole environment in which we are living. The pollution of the marine environment is a menace to public health and even the existence of the human race. From a microcosmic point of view, marine pollution threatens natural resources and transport which we depend on. The healthy marine environment guarantees seafood sources which has brought prosperity to the fishing industry and relevant industries as well. Besides food, the marine environment provides other natural resources such as oil and mines when land resources are limited or over-exploited.

Marine pollution may have impacts on global shipping and port activities which are the backbone of international trade today.

Lastly, the sea provides a place for recreation. The beautiful sight of beaches as well ocean sport never stops attracting people. The range of interests and threat is indeed so vast that the field of marine pollution control might be said to extend from relatively minor, minimally threatening harms at one extreme to potentially catastrophic, genuinely frightening hazards at the other. [1]

Legal development is shaped by events.[2] It was shipping activity that first brought marine pollution into the forefront of public concern.

[1] Douglas M. Johnston, *The Environmental Law of the Sea* (Berlin 1981), 193.
[2] *Ibid*., 25.

Thanks to the disaster in 1967 when the *Torrey Canyon*, a Liberian tanker went aground off the coast of England resulting in a large oil spill, the awareness of the maritime community on the issue of marine environment protection was aroused. Later the succession of other maritime disasters such as the *Minamata,* the *Santa Barbara,* and the *Amoco Cadiz* oil spills further accelerated the legal reform in the field of marine pollution control especially in the regulation of ship-generated pollution.

The legal framework of international law has been created and developed to control and prevent marine pollution. The international maritime law is convention-based and stretches from public international law to private international law covering the regulatory law in between. In on other field of maritime law is such a spectrum so readily apparent.[3] The public international law which regulates inter-state relationships is mainly included in the 1982 UNCLOS Part XII and Intervention Convention of 1969 which specially deals with oil pollution casualties on the high seas. The regulatory international law consist mainly of IMO conventions focusing on the preventive measures, technical standards imposed on vessels for preventing marine pollution as well as mitigation of pollution. The regulatory law consists of the following conventions: MARPOL, Dumping, AFS, BWM, Basel, OPRC, OPRC-HNS PROT. The private international law relating to marine pollution copes with remedial aspects of the marine pollution and limitation of liability. The conventions that fall into the private part of the spectrum include FUND, SUPP FUND PROT, CLC, HNS, Bunkers, Salvage.

In the spectrum of international law controlling marine pollution, the law governing ship-generated pollution is of vital importance. Since regardless of whether the pollutants are from bunkers, cargo tanks of ships or land-based wastes carried by ships for the purpose of dumping, they come directly from ships. Hence the law governing vessel-source pollution covers accidental oil spill to operational discharges and deliberate dumping of wastes. Furthermore, vessel-source marine pollution law today is

[3] Jingjing Xu, "The Spectrum of the Legal Regime Governing Ship-source Oil Pollution and Its Economic Implications" (2006) JIML12, 405.

becoming more comprehensive and extends to more specific aspects such as ballast water as well as exhaust emissions from ships. It is therefore necessary to provide a clear understanding of the legal framework of vessel-source pollution.

1.2 Purpose and Disposition

Bearing the above background in mind, the purpose of this thesis is to analyze the international law framework that regulates vessel-source pollution to provide a clear understanding of the international legal regime for marine environment protection. Moreover, since the success of operation of international law depends largely on how the laws are implemented into national legislation and how they are enforced, it is also the purpose of this thesis to conduct research of how the conventions are implemented and enforced at the national level. For this purpose, a case study of national legislation and judicial practice regarding vessel-source pollution control law in China is conducted so as to examine how successfully the international law has been implementation in national legislation.

In the following chapter, various sources of marine pollution including land-based pollution, pollution from seabed activities and pollution from atmosphere are discussed here with the purpose of introducing the background of vessel-source pollution which is one of the main sources of marine pollution. The disputable issue of whether the pollution resulting from exhaust emissions from vessels is a source of marine pollution is discussed here with the writer's opinion being presented.

The third chapter revolves on vessel-source pollution. In this chapter a close study of vessel-source pollution is conducted by detailed analysis of the characteristics and classification of vessel-source pollution. The controversial topic of whether dumping is vessel-source or land-based pollution is touched upon as well.

The forth chapter is the core of this thesis in which the legal framework of international law regulating vessel-source pollution is analyzed. First an overview of the public international law including mainly Part XII of the 1982 UNCLOS and Intervention Convention is provided and

then IMO regulatory law is presented with a close study of the regulatory law of MARPOL Annex II.

The fifth chapter focuses on the national legislation and practice of China regarding the implementation of international law of regulation of vessel-source pollution. Major national legislation: the Marine Environmental Protection Law (the 2000 MEPL) and Regulations on Administration of Prevention and Control of Pollution to the Marine Environment by Vessels (the 2009 Regulation) are analyzed in detail.

The sixth and final chapter is the conclusion in which a summary and some recommendation are presented.

1.3 Legal Issues and Delimitation

From a legal as well as scientific standpoint, a rational approach to the task of protecting and preserving the marine environment must be considered within the bounds of a time spectrum relative to incidents of marine pollution.[4] The design and formulation of law should consist of both a preventive dimension, as well as a mitigative and remedial dimension. The legal issues related to vessel-source pollution are: the legal mechanism devised to prevent pollution before it occurs and the legal measures adopted to mitigate and remedy the loss after the pollution happens. These two issues are closely interrelated since they deal with the same basic objective.[5] The mitigative and remedial mechanisms are based on the assumption that preventive measures do not always succeed. [6]

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[4] *Ibid*., 404.

[5] Thomas A. Mensah, "The Legal Problems Relating to Marine Pollution by Oil", in Peter Hepple (ed.), *Water Pollution by Oil*, Proceedings of Seminar Sponsored by the Institute of Water Pollution Control and the Institute of Petroleum (London: the Institute of Petroleum, 1971) 293.

[6] Proshanto K. Mukherjee, "The Penal Law of Ship-source Marine Pollution: Selected Issues in Perspective", in Tafsir Malick Ndiaye and Rudiger Wolfrum (eds), *Liber Amicorum Judge Thomas A. Mensah: Law of the Sea, Environmental Law and Settlement of Disputes* (Leiden: Martinus Nijhoff, September 2007, pp.463-496), 471, as cited by Fang Ying, "Ship Recycling in the International Regulatory Regime of The Marine Environment: Selected Legal and Practical Issues and Implications", Master dissertation, (Malmö: World Maritime University 2010) 6.

The primary purpose of preventive law is to impose reasonable precautions to reduce the frequency of incidents, and to minimize the damage before they occur. The problems are more concerned with the technical aspects of the problems, namely operational standards, conditions, professional criteria, licensing techniques, guarantees of accountability, and other modes of management.[7] Most of the preventive law developed in this field is regulatory with their substance being technical and the procedural. Therefore, the application of the regulatory law here largely depends on the development of technical knowledge development and expertise.

The problems relating to the prevention of vessel-source pollution can further be categorized according to the way which the pollution occurs. This will be dealt with in the third chapter.

The remedial law on the other side focuses on balancing the conflicting interests of different parties, namely the interests between coastal states and navigation states, the interests between exporters and importers, or between producer, supplier and consumer, as well as among different organizations. The legal problems here mostly rest on traditional concepts of fault, negligence, or criminal culpability, or on strict liability or no fault systems, sometimes accompanied by provisions for the victims' entitlement to compensation through the establishment of a fund for that purpose.[8]

It should be noted that the preventive and mitigative mechanisms fall in the public international law part of the legal framework while the remedial mechanism belongs to private international law.

This thesis focuses on the legal issues of prevention of vessel-source pollution that belong to the part of public and regulatory international law. The remedial issues included in private law are beyond the scope of the discussion in this thesis. Moreover, this thesis does not attempt to analyse all the conventions in detail; only a few selected conventions are studied carefully with the purpose of gaining a better understanding of certain aspects of the legal regime of prevention of vessel-source pollution. The

[7] Johnston, (n. 1), 199.
[8] *Ibid.*

conventions under consideration include the 1982 UNCLOS (Part XII), the 1969 Intervention Convention, and MARPOL 73/78 and its Annex II.

2 Sources of Marine Pollution

2.1 Introduction

As the oceans are used in many ways, pollution caused by human activities occurs in various ways as well. The potential harm brought about by human intervention in the oceans include the entry of chemicals, particles, industrial, agricultural and residential waste into the ocean, and also the organisms carried by ballast water.

Before looking into the preventing and control mechanism of marine pollution, it is necessary to have an understanding of this kind of pollution: its definition and sources.

The United Nations Convention on the Law of the Sea (the 1982 UNCLOS) which serves as the constitution of the oceans provides a definition of marine pollution. In Article 1 *Use of terms and scope* paragraph 1, subparagraph (4) defines "pollution of the marine environment" as:

> "… the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, 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."

In this definition, marine pollution is caused by human activities, either by "introduction of substances or energy" such as dumping and oil spill, or by "other legitimate uses of the sea" like deep-sea mining and offshore exploration activities. Shipping, wastes from land and fishing can all be sources that bring harm to the marine environment. Furthermore, how

substances are introduced into the marine environment is irrelevant; both direct and indirect influence is included.[9]

Basically sources of marine pollution can be categorized into three kinds, namely land-based pollution, vessel-source pollution and pollution from seabed activities and deep sea mining.

2.2 Land-based Marine Pollutoin

Land-based source is by far the major threat to the marine environment, which is estimated to account for over 80 per cent of overall marine pollution.[10] Those pollutants from land-based harm the marine ecology and affect human life in the end; they may also directly relate to human health through contaminated sea food. There is also growing evidence of the health hazards associated with swimming in polluted coastal waters.[11]

Land-based pollution can be defined as pollution of maritime zones caused by discharges from coastal establishments or other sources situated on land or artificial structures.[12] According to Article 207 of the 1982 UNCLOS, "land-based sources" includes rivers, estuaries, pipelines and outfall structures. The 1992 OSPAR and Helsinki Conventions take a novel approach which refers to pollution from "point or diffuse inputs from all sources on land" whether these are waterborne, airborne, or come directly from the coast.[13]

Although the sources may be limited in the definitions, they in fact involve diverse human activities and a variety of pollutants which are of great hazard to the marine environment.

The characteristics of land-based pollution can be categorized as follows:

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[9] Øystein Jensen, "Coastal State Jurisdiction and Vessel Source Pollution: The International Law of the Sea Framework for Norwegian Legislation", (2006) FNI Report 3, 47. <http://www.fni.no/doc&pdf/FNI-R0306.pdf> accessed May 2011.

[10] Patricia Birnie and Alan Boyle, *International Law and the Environment* (Oxford University Press 2002), 408.

[11] Johnston, (n. 1), 230.

[12] United Nations Institute for Training and Research, < http://elp.unitar.org/-Land-Based-Marine-Pollution-.html > accessed in May 2011.

[13] Birnie and Boyle, (n. 10).

Land-based marine pollution arises from diversified human activities from both coastal areas and further inland. The activities include daily life of human, agricultural, industrial production as well as military activities. All of them are necessary and unavoidable for the operation of the society.

The pollutants from land-based sources cover wide range of substances, such as chemicals, oil and oily wastes, organic materials, as well as some radioactive substances. Most of them are of the greatest threat to the marine environment,[14] because some of the input substances are toxic, persistent and liable to bio accumulate[15] and some of them are invisible therefore is hard to control.

The third characteristic of this source pollution is that it is usually hard to trace the source of the pollution and to identify responsible polluters. Therefore land-based pollution control is more dependent on tax-incentive or tax-deterrent systems than on traditional legal instruments. [16] The source of land-based marine pollution is from a permanent localized source. Invariably, land-based marine pollution originates in areas where national sovereignty is undisputed: land territory or territorial waters. Therefore national regulations are of great importance as well as regional cooperation between states that border on the same seas.

Land-based source of marine pollution is addressed in the 1982 UNCLOS. Under Article 207 of the 1982 UNCLOS, states are required to adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources. Further, states must enforce their laws and regulations adopted in accordance with article 207 and must adopt laws and regulations and take other measures necessary to implement applicable international rules and standards established through competent international organizations or diplomatic conference to prevent, reduce and control pollution of the marine environment from land-based sources.[17]

[14] Edith Brown Weiss, Stephen C. Mccaffrey, Daniel Barstow Magraw, A. Dan Tarlock, *International Environmental Law and Policy* (Aspen Publisher 2006), 673.
[15] The 1992 OSPAR Convention, Annex I, Article 3.
[16] Johnston, (n. 1), 237.
[17] The 1982 UNCLOS, Article 213.

2.3 Pollution from Seabed Activities

Seabed activities include exploration and exploitation of the both territorial sea or continental shelf and international seabed. Two kinds of operations may be involved, namely: platform–based or rig-generated activities associated directly with exploration of or production of offshore natural gas or oil; and related activities associated with the transmission of offshore gas or oil by pipeline to on-shore or off-shore reception facilities.[18]

Maine pollution caused by seabed activities usually arises from oil spillage or gas escape during the process of exploration or transmission. But pollution that happens during the transport of seabed oil by tanker should be distinguished as ship-generated pollution which is regulated under vessel-source pollution control law. There are other sorts of pollution resulting from seabed activities, for example, the mud mixtures which are generated during offshore operations may also bring harms to marine environment. Sewage generated during the operations is also accountable for marine pollution.

Normally spillage and escape rarely happens except accidents. Since the spillage and pollution are against the economic interests of both the operator and the coastal state. Moreover, pollution can easily be traced and therefore there is always responsible or liable party for such pollution when it happens. Since the operation takes place at the coastal areas, the pollution resulting from such activities is virtually under the sovereign control of coastal states. National law governs the environmental aspects of such operation in all aspects from preliminary exploration to final, full-scale production and distribution. The international aspect of this sector of marine pollution control may be limited to questions of liability and compensation with respect to neighbouring states that may suffer environmental damage and incur cleaning up costs as a direct result of a major spillage in the offshore areas of the same region.[19] National legislation and regional treaties are more effectual in control this source of marine pollution.

[18] Johnston, (n. 1), 237.
[19] Johnston, (n. 1), 198.

2.4 Atmospheric Pollution

The marine environment is also vulnerable to pollution from the air which is referred as atmospheric pollution. For instance, acid rain from the atmosphere enters the ocean causing acidification of the marine environment. Atmospheric pollutants emanate mainly from exhaust emissions from land, which contain SOx and NOx and CO_2. The first two cause acid rain which results acidification of the ocean; while the third one contributes to global warming which brings a result of rising temperature of the ocean. All of them harm the marine environment. Another threat is from the nuclear weapon testing. The fallout of radioactive particles from the atmosphere threatens the flora and fauna as well.

Article 212 of the 1982 UNCLOS titled "Pollution from and through the atmosphere" addresses this source of marine pollution. Pursuant to Article 212, States must adopt laws and regulations and take other measures to prevent, reduce and control pollution from atmosphere.

Although maritime shipping is the transport sector with the lowest fuel consumption in terms of cargo volumes and distance covered, emissions from shipping contribute to the release of greenhouse gases.[20] Besides, among all modes of transportation, shipping ranks the highest in terms of SOx emissions, at least in the northern hemisphere.[21] Therefore exhaust emissions from vessels contribute to the pollution of atmosphere, which can be referred as air pollution caused by vessels. But this kind of pollution is different from the atmosphere pollution which mean the pollution of marine environment from the air.

[20] Peter Ehlers, "Effects of Climate Change on Maritime Transport" in Neil Bellefontaine and Olof Linden (eds.), *Impacts of Climate Change on the Maritime Industry* (Malmö: World Maritime University 2008), 43.

[21] Axel Michaelowa and Karstn Kraus, "International Maritime Transport and Climate Policy" *Intereconomics*, 35, 3, 2000, 127 at p.130, as cited in Proshanto K. Mukherjee and Jingjing Xu, "The Legal Framework of Exhaust Emissions from Ships: A selective Examination from a Law and Economics Perspective" in Neil Bellefontaine and Olof Linden (eds.), *Impacts of Climate Change on the Maritime Industry* (Malmö: World Maritime University 2008).

A disputed issue here is with respect to atmospheric marine pollution caused by exhaust emissions from ships. It is referred to as air pollution in Annex VI of MARPOL.

However, in the opinion of the writer, the exhaust emission from ships should not be categorized as atmospheric pollution, since the emissions from ships do not go into the marine environment directly; instead, they enter first into the air, and mix with other pollutants (mainly from land) in the atmosphere and then fall down into the sea in the form of rain. It is hardly the case that acid rain is caused entirely by the emissions from ships at sea. Much of the air pollution is attributable to vehicles and other polluting sources on land.

Besides, it is of the same logic with "air pollution from land". Since this kind of pollution is defined as air pollution or atmospheric pollution, the air pollution caused by ships should also be classified as the atmospheric pollution. The term air pollution from ships, is thus terminology that is imprecise at best and a misnomer at worst.[22]

[22] Fang Ying, "Ship Recycling in the International Regulatory Regime of The Marine Environment: Selected Legal and Practical Issues and Implications", Master dissertation, (Malmö: World Maritime University 2010), 6.

3 Vessel-source Marine Pollution

3.1 Introduction

Vessel-source pollution means pollution generated by shipping activities. It can be attributable to accidental spillage of the pollutant cargoes carried by ships or the operational activities of the ship like washing of tanks and changing of ballast water.

Although ship generated pollution only contributes in a relatively minor way to the overall marine pollution compared with land-based pollution, it was the first kind of pollution that raised the awareness of the world community on the issue of marine pollution. The legal development in the control of vessel-source pollution (mostly in 1970s and 1980s) was actually a response to the series of incidents that happened during that time. Moreover, this source of pollution never stops attracting international attention ever by the occasional occurrence of casualties such as the recent disasters on the seabed in the Gulf Mexico. This is mainly because of the characteristics of ship generated pollution.

Vessel-source pollution, mainly oil pollution, is so conspicuous that it is impossible to be ignored by the public not to mention environmentalists. Although oil is non-toxic, and can eventually be cleaned and absorbed by the ocean itself, the black pollution never stops striking the world community by its vast coverage and appearance.

Besides the conspicuity, vessel-source pollution is more likely to be an international issue than a national one compared to land-based pollution. It is primarily because the sea physically links the countries and continents of the world with unbreakable and multi-directional links, what happens to the marine environment, whether it originates from the high sea or from territorial seas, more often than not produces repercussions at the international level.[23] Moreover, the characteristic of mobility of the ship

[23] Mensah, (n. 5), 293.

adds to the international feature of this issue. The ship as a vehicle on the sea travels continuously around world, in and out of every kind of maritime zones of different sovereign regimes, due to the requirements for international trade. Nowadays, larger vessels have been transporting increasingly dangerous cargoes over greater distances. Potential pollutants such as oil and chemicals travel with vessels in their tanks or bunkers from one country to another. The transnational character of ship source pollution can be seen from following example that is illustrated by Abecassis:

> A ship may strand on the high seas and cause pollution in two neighboring states, i.e. France and England (as with the *Torrey Canyon* in 1967). She may be owned by a Liberian company, bareboat chartered to a Bermuda company, managed by an English company, time chartered to a Greek company and voyage chartered to an American company. Her cargo may have been sold during the voyage by the American company to a Japanese one. The officers may be English and the crew Indian. The international nature of the shipping business creates such a diversity of interests, with potential conflicts of law and jurisdiction. [24]

In the mean time, the floating characteristic of most pollutants assist with diversifying the spread of pollution and its eventual dissipation.[25] The floating characteristic of most pollutants such as oil and chemicals assisted with the nature forces like current, wind etc., as well as the mobile characteristic of the ship, has therefore the effect of diversifying the spread of pollution which results in trans-boundary pollution eventually.[26]

Considering the international characteristic of vessel-source pollution, it is therefore of little doubt why legal reform in marine environmental protection started from prevention and control of vessel-source pollution. Although the pollution can be typified by various pollutants, legal measures are adapted to circumstances according to the way the pollution occurs. It is

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[24] Abecassis, "Marine Oil Pollution Laws: The View of Shell International Marine Limited", 8 INT'L. Bus. Law.3 (1980), as cited by Jeff B. Curtis, "Vessel–source Oil Pollution and MARPOL 73/78: An International Success Story?" 15 Envtl.L 679, 670.
[25] Mukherjee, (n. 6).
[26] *Ibid.*

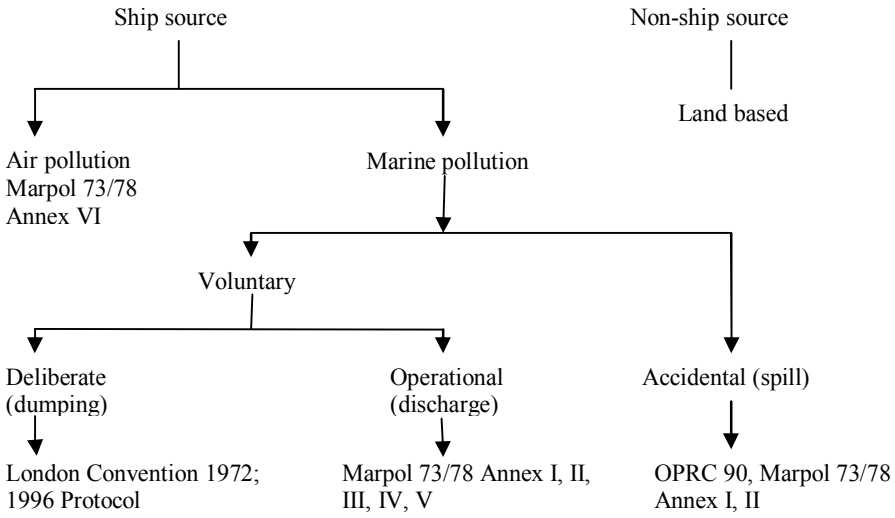
common ground that ship-source pollution is and should be typified to make distinctions between human intervention and fortuitous causes that result in the entry of pollutants into the sea.[27]

Two types namely, voluntary pollution and involuntary (accidental) pollution are recognized under this characterization. Dr Thomas A. Mensah categorised vessel-source oil pollution into two types: pollution arising from the deliberate discharge of oil into the sea ("voluntary pollution") and pollution resulting from accidental discharge or escape of oil into the sea ("accidental pollution").[28] According to Dr Thomas A. Mensah, voluntary pollution arises mainly from the activities of ships in the marine environment and from the use of the sea as dumping ground of the oily by-products from industrial plants; accidental pollution arises from the presence of ships and from activities connected with the exploration and exploitation of the sea, the sea-bed and the ocean floor.[29]

Article 194 of the 1982 UNCLOS recognizes these sorts of pollution. The provision is titled ***Measures to prevent, reduce and control pollution of the marine environment.*** In paragraph 3 (b), different measures are required according to the types of vessel-source pollution. Two types of vessel-source pollution are identified, including pollution caused by accidents, and pollution resulting from intentional and unintentional discharges. The two types are referred to as involuntary (accidental) discharge and voluntary discharge as well.

Furthermore voluntary discharge can be divided into two sub-types: operational discharge and deliberate dumping. The operational discharge is necessary for the operation of the ship, which is unavoidable; while dumping of wastes on the sea is deliberate. The categorization is clearly depicted by Professor Mukherjee in the following flow chart:[30]

[27] Mukherjee, (n. 6), 4.
[28] Mensah, (n. 5), 295.
[29] *Ibid.*
[30] Proshanto K. Mukherjee, World Maritime University Lecture Materials 2010.



With the general background of the types of vessel-source pollution, it is now necessary to have a close look at those types of vessel-source pollution.

3.2 **Accidental Pollution**

Accidental vessel-source pollution is involuntary and non-intentional pollution which arises from marine accidents. Accidental vessel-source pollution may result from marine accidents such as collisions and groundings. The causes may be faults of the ship such as physical failure or unseaworthiness, wrongful operation, or force majeure. The pollutants may include oil both as cargo carried in tankers and as fuel oil in the tanks, a well as other NLS.

Accidental pollution was the first form of vessel-source pollution that aroused public attention, when the grounding of the *Torrey Canyon* resulted in a large quantity of oil spills into the sea. This incident greatly shocked the world community. There have been quite large amounts of pollution coming from accidents. A few years after the *Torrey Canyon*, in 1974 the dramatic loss of the *Metula* in the Strait of Magellan and the grounding of the *Showa Maru* highlighted the dangers of transport of oil in

environmental sensitive areas.[31] Other headline news include the oil spills of the *Argo Merchant, Sansinena, Oswego Peace, Olympic Games, Daphne, Grand Zenith, Baroca, Mary Ann, Universal Leader and Irenes Challenger*. The text book case of the *Amoco Cadiz* in 1978 and the relatively recent ones of the *Erica* and the *Prestige* once again illustrate the threat of the oil tanker to the marine environment.

However, although public attention is always given to the marine pollution resulting from accidents, this kind of pollution accounts for a minor part of the vessel-source pollution. Major pollution is caused by the other source: operational discharges from vessels.

3.3 Operational Discharge Pollution

Operational discharge, as a sub-type of the voluntary ship source pollution is distinguished from accidental pollution by its polluting way involving human intervention. While accidental pollution results from accidental events, operational discharges pollution is generated from the regular and normal operational activities of ships in the marine environment no matter it is moving or at anchor or alongside.

Ship-related operational discharges include oil and oily wastes, chemicals and other noxious substances. Oil (mainly crude oil) or oily wastes are from the discharge of bilge water from machinery spaces and ballast water of fuel oil tanks. Large oil tankers contribute greatly to the oil discharges through their oily tanker washing residues and oily ballast water.[32]

The main pollutants from operational discharge are oil and oily wastes. However, other chemical substances and noxious wastes, such as toxic chemicals and biological agents, may be contained in bilge water as well. Moreover, when the tankers are used for carrying chemicals and other noxious substances as cargo, residues will always be left after the cargoes are discharged. The most convenient and cheapest way to emptied those

[31] Johnston, (n.1), 204.
[32] UNEP, Global Maritime Oil Pollution Information Gateway, "Operational Discharges of Oil" <http://oils.gpa.unep.org/facts/operational.htm> accessed May 2011.

substances and clean the tanks is again by using the sea water. Those chemical materials however pose big threat to the marine environment and public health.

Another kind of pollution resulting from operational activities of ships which cannot be ignored is the ecological damage of marine environment caused by ballast water discharges. This type of pollution has caught public attention in recent years. Ballast water discharge may destroy the regional marine ecosystems because a variety of organisms, including plants, animals, viruses, and other microorganisms in the discharged waters, which belong certain regions are brought to other regions by discharge of ballast water. This brings in alien species into certain special regions and cause further ecological damage to aquatic ecosystems of those regions.

It is again attributable to the international characteristic of the ship and shipping activities. Large vessels use significant amounts of ballast water for stability. The water is taken from one coastal area and carried by the ship to the next port and is discharged or exchanged at different ports. Merchant ships, especially those with large tanks and those carrying bulk cargoes load goods at different ports all around the world and discharge them at different destinations. Whenever the ship uploads and discharges cargoes, a corresponding weight of ballast water is discharged or taken in so as to maintain the balance for the rest of voyage. It happens almost all the time during her voyage, until she finally arrives at the last destination and discharges all of the ballast water. At the same time, species which belong to certain areas are brought by the ballast water to other part of the world to which the ship has been. As a result the balance of marine ecosystem of some vulnerable areas is ruined. Furthermore, due to the warming of the seas, there is a higher risk of alien species being introduced through the ballast water of ships.[33] Therefore there is also an urgent need for efficient control ballast water management.

All in all, although large oil tanker spills always catch public attention, the pollution caused by operational discharge of oily wastes, chemical wastes and spills of chemical and other noxious substances, as

[33] Ehlers, (n. 20), 43.

well as the invading species brought by ballast water, have a cumulative effect in polluting the marine environment. Because this kind of discharge is systematic, a regime of prevention has to recognize its necessity as well as its potentially cumulative effect.[34]

3.4 Dumping

While operational discharge is caused by necessity which is unavoidable, there is another kind of voluntary action through which pollutants enter the sea which is ocean dumping. The discharge of dumping wastes is voluntary and controllable; it is deliberate action which is distinguishable from operational discharges even though they are both voluntary. The difference is their purposes. For ocean dumping, the only purpose of those ships carrying wastes from land is to dump them into the sea. Its purpose is intentionally using the ocean as natural waste repository for the unwanted wastes and effluents on land. The presence on board is unavoidable but their discharge into the sea can be controlled by containment on board or by setting of permissible standards of discharge based on scientific data and technological know-how.[35]

A wide range of wastes is involved most of which are land-based including industrial wastes, sewage of human's municipal life, sludge and wastes from construction work, as well military wastes which may contain radioactive, chemical and biological substances. Most such wastes are from land, while there are shipboard garbage and sewage disposals as well. Some of the wastes such as nuclear and radioactive matters can cause serious hazard to the marine environment.

It is disputable as to whether deliberate dumping is vessel-source or land-based pollution. On the one hand, the dumped wastes are land based. As mentioned above the wastes come from municipal life, industries, construction work, and military activities. Therefore pollution caused by dumping can be regarded as land based in this aspect. On the other hand the

[34] Mensah, (n. 5), 295.
[35] Xu, (n. 3), 406.

entry of the wastes into the sea is carried out by vessels. It is vessel-source in this aspect.

Here the ocean dumping is categorized as vessel-source pollution. It is for the reason that carriage of land-based wastes for dumping is analogous to carriage of goods by sea for the purpose of trading. Neither the dumped wastes nor the potential polluting materials carried as cargoes are directly related to the sea; they are both land-based to certain extent. Since the pollution caused by oil and chemical cargoes and other potential pollutants is categorized as vessel-source pollution, so should pollution caused by wastes from dumping. At this point, dumped wastes are no less different from other vessel-source pollutants, such as oil and noxious substances which are carried by ships but serve for land-based needs. Therefore dumping can be regarded as vessel-source pollution, which is regulated under the legal framework of vessel-source pollution control law.

4 Framework of International Law in Preventing Vessel-source Pollution

4.1 The Framework in General

Various international instruments have been created to regulate vessel-source pollution. Those conventions constitute an international legal framework for vessel-source pollution. The framework comprises a series of international conventions from public international law (including pure public international law and regulatory international law) to international private law, touching every aspect of the vessel-source pollution from prevention, mitigation to remedy. Moreover, the public and private parts are correlated and interface with each other. In the scope of preventive law, all the conventions fall within the domain of pure public international law and regulatory international law. The pure public international law governs the relationship between states as well as international organizations. Three conventions, UNCLOS, Intervention, and Salvage (partially), play important role in this regime. Among all the conventions, the 1982 UNCLOS is of utmost importance. It serves as an umbrella international regime under which all other conventions fall into place.[36] Part XII of UNCLOS bearing the caption "Protection and preservation of the marine environment" is devoted to this subject. Regarding the prevention of vessel-source pollution, Article 194 paragraph 3 specifically requires states to take individually and jointly all measures necessary to prevent, reduce and control pollution of the marine environment resulting from vessel-source, either from accident or from intentional or unintentional discharge. The measures include regulating the design, construction, equipment, operation and manning of vessels. This provision provides a general ground for the regulatory law.

Another important convention in the public international law regime is the International Convention Relating to Intervention on the High Seas in

[36] Xu, (n. 3), 407.

Cases of Oil Pollution 1969, was generated in response to the disaster the *Torrey Canyon* in 1967. The Intervention Convention is a public international law convention with the distinction of establishing for the first time the jurisdiction of coastal states over foreign vessels on the high seas subject to the conditions set out in the convention.[37] This convention will be analyzed in detail in the next section of this chapter.

The third public international law convention for preventing vessel-source pollution is the Salvage Convention of 1989. Although the Salvage Convention is primarily a private law convention, it also has some certain provisions pertaining to the coastal State's right to control salvage operations through public authorities and to take measures to protect its coastline or related interests from pollution, actual or threatened, following a maritime casualty.[38]

Regulatory international law consists of various conventions that deal with preventive measures imposed on ships. Most of those conventions focus on the technical aspects of the ships. The conventions here include MARPOL73/78 (regulating the operational discharges from vessels), Dumping (deal with vessel carrying wastes for dumping into the sea), AFS (addressing the control of harmful anti-fouling system of ships), BWM (regulating the ballast water management of ships), Basel (covering the control of transboundary movements of hazardous wastes), OPRC (regulating oil pollution preparedness, response and co-operation); OPRC-HNS Protocol (addressing the preparedness, response and co-operation to pollution incidents by hazardous and noxious substances). It is worth noting that, some conventions are preventive or remedial in scope; others are hybrid or multiple in nature comprising any combination of preventive, mitigative and remedial characteristics.[39] Among all the regulatory convention, MARPOL73/78 with its six Annexes is of significant importance in the realm of regulatory international law. It deals with the operational discharges from vessels. MARPOL73/78 Annex II is therefore

[37] Mukherjee, (n. 6), 17.
[38] *Ibid.*
[39] Mukherjee, (n. 6), 15.

selected for discussion so as to afford a better understanding of the regulatory law regime.

4.2 Public International Law

4.2.1 Part XII of the 1982 UNCLOS

Part XII of UNCLOS is titled the *Protection and Preservation of the Marine Environment*. Forty five articles within eleven Sections are set out in this part. Under this the framework provided in this chapter, various preventive and remedial conventions are developed. Selected articles regarding the prevention and control of vessel-source pollution are discussed below.

In section 1, general obligations of states to protect and preserve the marine environment are prescribed. Article 194 paragraph 3 specifically requires states to take measures to prevent and control pollution of the marine environment from vessels. These measures must be designed particularly for preventing accidental pollution and responding to emergencies to prevent and control operational discharges. Article 195 prescribes the duty of states to prevent transboundary pollution and transformation of pollution. This article provides the ground for the later Basel Convention which deals with transboundary movement of hazardous wastes. Article 196 requires states to prevent transportation of harmful alien species. The BWM Convention is developed under this general provision.

Section 2 focuses on international cooperation for the preservation and protection of the marine environment. Article 199 in this section requires states to develop contingency plans for responding to pollution incidents and is the blueprint for the OPRC Convention.[40]

Section 5 titled international rules and national legislation to prevent, reduce and control pollution of the marine environment is. The prevention of the marine environment from different sources of pollution is addressed in this section. Article 210 addresses dumping which provides the ground

[40] Jingjing Xu, "The Public Law Framework of Ship-source Oil Pollution" (2007) JIML 13, 417.

for the Dumping Convention. Article 211 containing 7 paragraphs pertains to the issue of vessel-source pollution. Paragraph 1 requires states to co-operate internationally by acting through international organization, which is IMO, or by establishing international instruments to prevent and control vessel-source pollution. Paragraph 2 focuses on flag state control. Flag states are obliged to adopt relevant legislative measures to implement the requirements in UNCLOS. It is apparently that these provisions are the seeds for the MARPOL Convention.[41] Paragraph 3 addresses port state control. In this paragraph, port states must establish particular port entry requirements with the purpose of vessel-source pollution control. However due publicity of such requirement must be given. Paragraphs 4 and 5 provide for coastal state control over foreign vessels within their jurisdiction including territorial sea, exclusive economic zones. Legislation may be adopted by coastal states pertaining to prevention and control of pollution from vessels. Paragraph 6 recognizes the special areas within the coastal states' jurisdiction which they reasonably and clearly define and adopt laws and regulations for the particular purpose of protecting those special areas. Special and additional mandatory laws, regulations and measures regarding prevention of vessel-source pollution are recognized but vessel design, construction manning or equipment standard shall not be higher than existing international rules and standards.

Section 6 deals with flag state, port state and coastal state enforcement. Article 216 to Article 221 deal with states enforcement over vessel-source pollution. Article 216 addresses states' enforcement with respect to pollution caused by dumping. Coastal states and port states are required to enforce international laws and regulations within their jurisdiction. Article 217 deals only with flag states enforcement. Flag states are obliged to enforce the international rules and standards of vessel-source pollution control laws and implement those laws in their national legislation. They must also ensure that vessels flying their flag comply with those rules and standard. Appropriate measures are required to be taken by flag states to prevent vessels from sailing when the relevant standards are not met.

[41] *Ibid.*

Paragraph 3 of Article 217 poses the certificates requirement for the vessels. The obligation of flag states include making sure that certificates are issued in accordance with international rules and standards and ensure that the actual condition of the vessels comply with the requirements in the certificates. Flag states undertake responsibility for investigation when their ships violate international rules and standards. The proceedings of flag states' investigation are prescribed in paragraphs 5, 6 and 7. Paragraph 8 touches upon the penalties provided by flag states legislation on their vessels. Port state enforcement is regulated under Article 218. Port states undertake the duty to investigate and institute proceedings when the vessel which is voluntarily within the jurisdiction of the port state, violates applicable international laws and standards. Port states' right of investigation and institution of proceedings shall not extend to vessels within ports or maritime zones of other states. The exceptions are: where the port state is suffering or is threatened by the discharge violation of the vessel within another state's jurisdiction; or the port state is required by the flag state of the violating vessel or state damaged or threatened damage by the violating vessel. Under article 219 port states is allowed to take administrative measures prevent vessels from sailing when there are grounds for believing that the vessel has violated international rules or standard of unseaworthiness and may threaten damage to the marine environment.

Article 220 contains 8 paragraphs dealing with the enforcement of coastal states. Coastal states' rights to undertake physical inspection, institute proceedings of foreign vessels and to require information from violating vessel are recognized in paragraph 1, 2, and 3. Coastal states' right of physical inspection and administrative measures such as detention, institution of proceedings over foreign vessels are also recognized in paragraphs 5 and 6 where there are clear grounds for believing that the vessel within the coastal states jurisdiction has committed a violation of international law resulting in a substantial discharge causing or threatening significant pollution of the marine environment.

Article 221 covers the pollution from maritime casualties. Paragraph 1 recognizes the right of states to enforce measures on the high seas in order to protect their coastline or related interests. There is a tacit assumption of the existence of the Intervention Convention.[42] "Maritime casualties" is defined here as "a collision of vessels, stranding or other incident of navigation, or other occurrence on board of a vessel or external to it resulting in material damage or imminent threat of material damage to a vessel or cargo." Article 222 mentions marine pollution through the atmosphere. It is obvious that MARPOL Annex VI *Prevention of air pollution from ships* stemmed from this article.

4.2.2 The Intervention Convention

The Intervention Convention is of significance in dealing with pollution caused by accidental oil pollution. It was adopted in 1969 as a direct result of the *Torrey Canyon* incident of 1967. There is too much literature on the notorious *Torrey Canyon,* but one of the positive results of this disaster was the generation of The Intervention Convention. At the time the *Torrey Canyon* disaster happened, there was already in place a convention concerning oil pollution: the 1954 Convention for the Prevention of Pollution of the Sea by Oil (OILPOL). However, it dealt more with operational discharges of oil. At the Brussels diplomatic conference in 1969 after the incident, questions were raised as to the extent to which a coastal State could take measures to protect its territory from pollution where a casualty threatened that State with oil pollution, especially if the measures necessary were likely to affect the interests of foreign shipowners, cargo owners and even flag States.[43] The Intervention Convention was adopted at the conference aiming to adjust the traditional relationship between coastal states and flag States in cases of marine pollution casualties. Together with

[42] *Ibid.*, 419.
[43] IMO, "List of Conventions: The Intervention Convention of 1969" <http://www.imo.org/about/conventions/listofconventions/pages/international-convention-relating-to-intervention-on-the-high-seas-in-cases-of-oil-pollution-casualties.aspx> accessed May 2011

the Intervention Convention, the Civil Liability Convention 1969 (CLC 1969) which deals with the private law aspect of oil pollution was adopted at the conference as well.

The Intervention Convention came into force in 1975. It opened a new era of international control over marine pollution by expressly recognizing the coastal states' right of intervention on the high sea in cases of oil pollution casualties, which changed the traditional flag States exclusive control of the vessels on the high seas. The Intervention Convention is meant to be a limitation of the freedom of the high seas.[44]

There are 17 articles in the convention. Articles I to Article VIII which provide the requirement for the execution of the intervention measures are the substantive provisions of the Convention. Chapters I and II of the Annex set out the procedures for conciliation and arbitration.

Under Article I, contracting states can unilaterally intervene on the high seas in cases of oil pollution casualties. In the case of an contingency, such as a potentially catastrophic spillage, the Intervention Convention permits the intervening state to take measures on the high seas as may be necessary to prevent, mitigate or eliminate grave and imminent danger to its coastline or related interests from pollution or threat of pollution of the sea by oil, following upon a maritime casualty or acts related to such a casualty, which may reasonably be expected to result in major harmful consequences.[45] Those measures been are required to be notified without delay to the related states and to the known physical person or entities as well as the Secretary-General of the IMO pursuant to Article III. (f).

Article II provides definitions of the following terms. "Maritime casualty" means a collision of ships stranding or other incident of navigation, or other occurrence on board a ship or external to it resulting in material damage or imminent threat of material damage to a ship or cargo. "Ship" includes any sea-going vessel of any types; oil includes crude oil, fuel oil, diesel oil and lubricating oil. "Related interests" mentioned in Article I means the interests of a coastal State directly affected or threatened by the

[44] Claude C. Emanuelli, "The Right of Intervention of Coastal States on the High Seas in Cases of Pollution Casualties" 25 U.N.B.L.J. 81, 1976.
[45] The Intervention Convention, Article I (1).

maritime casualty, which include maritime coastal, port or estuarine activities, such as fisheries activities, constituting an essential means of livelihood of the persons concerned. It also includes tourist attractions of the area concerned; the health of the coastal population and the well-being of the area concerned, including conservation of living marine resources and of wildlife.[46]

Article III of the convention requires the coastal state before exercising intervention measures, to consult first with other states affected by the maritime casualty, particularly with the flag State of the vessel concerned. The intervening state is also required to notify with no delay the proposed measures to any persons or entity that can reasonably be expected to be affected by the measures to be adopted by the intervening state. The coastal state is also required to take into account the opinions of those persons or entities. If the coastal state is proceeding to a consultation with independent experts, those independent experts must be chosen from a list maintained by the IMO pursuant to Article IV. Only under extreme urgency that renders necessary measures to be taken immediately, may the coastal state omit the prior notification or consultation or terminate the consultation already begun. Before and during the intervention, the coastal State is also required to take the safety of human life into consideration, and must use its best endeavours to avoid any risk to human life, and to provide any assistance to persons in distress, and in appropriate cases to facilitate the repatriation of ships' crews, and raise no obstacles.

With regard to the intervention measures taken by the coastal state pursuant to Article I, Article V requires those measures to be proportionate to the actual or threatened damage. They must be limited within the reasonable necessity to prevent, mitigate or the danger to their coastline or related interests mentioned in Article I. The following aspects must be considered before taking those measures: the extent and probability of imminent damage if those measures are not taken; and the likelihood of those measures being effective; and the extent of the damage which may be

[46] The Intervention Convention, Article II.

caused by such measures.[47] Wrongful exercise of the right of intervention may lead to a sanction under the convention. The coastal state must pay compensation to the damaged party under Article VI if the measures taken by the coastal state cause damage to third parties.

Article VII preserves the rights, duties, privileges or immunities which can be enjoyed by any person and any remedy otherwise applicable.[48]

Article VIII regulates settlement of disputes under the convention. Any dispute arising from this convention is required to be negotiated first between parties. If the negotiation fails, the dispute must be submitted to conciliation, and then to arbitration if conciliation does not succeed.

The Intervention Convention applies only to oil pollution, but the Protocol to the convention which was adopted in 1973 addresses marine pollution or threat resulting from substances other than oil. The list of substances has been updated through a supplement in 1996. The 1969 convention and its 1973 Protocol constitute a major achievement towards the protection of coastal states' interests against maritime pollution hazard.[49] Plus, the 1969 Intervention Convention has proven to provide the basis for future development of the right of intervention. It has demonstrated that the IMO (IMCO at that time) offered a valuable framework for such development. Following this convention, several multilateral and regional conventions were adopted in Europe which demonstrated the inspiration provided by the world wide solution of the Intervention Convention with respect to the protection of the marine environment.

Despite the later regulatory conventions providing various technical requirements with regard to preventing the accidental oil spills, the Intervention Convention still plays an important role keeping in mind that the preventive law may not be always successful.

[47] The Intervention Convention, Article V. 3.
[48] Xu, (n. 40), 421.
[49] Emanuelli, (n. 44), 95.

4.3 Regulatory International Law: MARPOL ANNEX II

In the domain of regulatory international law, most international instruments are produced by IMO. The MARPOL Convention is of significant importance among those IMO conventions.

As the name indicates, the MARPOL Convention deals with the prevention of pollution of the marine environment by ships from operational or accidental causes. The Convention consists of two instruments namely MARPOL 1973 and its 1978 Protocol. MARPOL 1973 was adopted in 1973, to create a comprehensive regime to regulate pollution of the marine environment by oil and other harmful substances. The 1978 protocol was added to it so as to facilitate the convention to enter into force. MARPOL73 adopted most of the provisions contained in the 1954 OILPOL Convention and finally replaced that which dealt only with oil pollution from ships' operational activities. Following the disaster of the *Amoco Cadiz*, a Protocol was adopted in 1978 which amended MARPOL 1973 in a substantive way. The 1978 Protocol provisions were merged with the original text and the convention then came to be known as MARPOL73/78. Despite the high cost of implementation, the convention finally entered into force in 1983. As of October 2009, 150 countries representing almost 99.14% of the world's tonnage had become party to Annexes I and II.[50]

MARPOL73/78 consists of 20 articles and six annexes. The substantial provisions are set out in the six annexes which include detailed requirements with regards to permissible discharges, equipment on board ships etc. Annex I covers the regulations for prevention of pollution by oil. Annex II regulates pollution caused by noxious liquid substances (NLS) in bulk. Annex III deals with prevention of pollution by harmful substances carried in packaged form. Annex IV contains the provisions regulating pollution by sewage from vessels; Annex V regulates garbage pollution from ships. Annex VI was adopted by the 1996 Protocol to the Convention

[50] IMO, "List of Conventions: MARPOL73/78" <http://www.imo.org/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-(marpol).aspx> accessed May 2011.

to regulate the prevention of air pollution from ships and included new features related to the design of ships. Article 14 of the convention provides that Annexes I and II are compulsory for state parties to the treaty which parties have to ratify together with the convention. Annexes III, IV, and V, VI are optional only; they are binding when the party has expressed its consent to accept. But states are well advised to subscribe to them for the sake of comprehensiveness and completeness.[51]

From Annex I to the newest Annex VI, MARPOL has created a comprehensive legal regime for the protection and control of vessel-source pollution. The six annexes are of the equal importance in the fields where they play respective roles. In this thesis, only Annex II is discussed in detail.

Annex II is the second mandatory Annex that States have to ratify or accede to at the time they join the convention. It entered into force in 1985 and was updated in 2007. The changes entered into force internationally on January 1, 2007. Annex II comprises preventive regulations and measures to reduce discharge of NLS transported in bulk. It consists of 18 Regulations divided into 8 Chapters. A wide range of chemical substances are covered in this Annex. In the appendices, procedures, equipment, materials and measures that are applicable to ships in bulks carrying NLS are set out.

Chapter I gives the definitions of terms and provides general provisions. Regulation 2 specifically provides this Annex applies to all ships certificated to carry noxious NLS in bulks. A few exceptions and exemptions are provided in Regulations 3 and 4.

Chapter 2 provides for the categorization of NLS. Regulation 6, the only regulation in this chapter sets out the four categories of NLS. It should be noted that the revised Annex II made in 2007 has updated the categorization. The categories in this regulation and relevant Appendix (Appendix I) to it were changed from the original A, B, C and D to categories X, Y, Z and "Other Substances". Category X is deemed to be the most harmful to the marine environment and therefore justifies the prohibition of discharge into the marine environment. NLS under Category Y are subject to a limitation on the quality and quantity of the discharge;

[51] Xu, (n. 40), 423.

Category Z substances are the least harmful and therefore justify less stringent restrictions. The Category "Other Substances" are those substances considered to present no harm to the marine environment and are not subject to any requirements for Annex II. Guidelines for use of the categorization of NLS are given in Appendix I to this Annex. In addition, paragraph 3 of this regulation provides that for NLS that has not been categorized under this regulation, it will be carried under the most severe conditions proposed until the full agreement has been reached between the governmental parties involved.

Surveys and Certification are covered in Chapter 3. Detailed requirements for surveys are prescribed in Regulation 8. An initial survey, a renewal survey, an intermediate survey as well as an annual survey are mandatory according to different periods after the certificate is issued. Sometimes an additional survey is required. The nomination of surveyors or recognizing organizations to conduct surveys and details regarding conduct of surveys are provided from 2.1 to 2.5. Paragraphs 3.1 to 3.3 provide requirements for the maintenance of the ship after the conduct of survey. Regulation 9 provides that the Certificate is issued by the Administration or any authorized organization who will assume full responsibility for the certificate. Only member states are entitled to issue the certificate. The duration of certificate shall not exceed 5 years.

Chapter 4 regulates the design, construction, arrangement and equipment of ships. In this chapter, ships built before 1st July, 1986 and ships built after this date are subject to different requirements. For instance, under article 11 ships are required to comply with either the International Bulk Chemical Code or the Bulk Chemical Rules depending on whether the ship is built after 1st July, 1986 or before that date.[52] The requirements for pumping, piping, unloading, and slop tanks in Regulation 12 are also prescribed depending on the age of the ship.

Chapter 5 deals with operational discharges of residues of NLS. Regulation 13 titled "*Control of discharges of residues of noxious liquid substances"* is perhaps the most important one of all the regulations in this

[52] MARPOL Annex II, Regulation 11.

Annex. Standards are set out for operational discharge of residues of substances in category X, Y, or Z, or ballast water, tank washings or other mixtures containing such substances.[53] The standards are:

The ships must be proceeding *en route* at a speed of at least 7 knots in the case of self-propelled ships or at least 4 knots in the case of ships which are not self-propelled; the discharge must be made below the waterline through an approved underwater discharge outlet; and the discharge must made at a distance of not less that 12 nautical miles from the nearest land in a depth of water of not less than 25 metres.[54]

The discharge of substances in category X and Y are stringently prohibited, while some exceptions are set for the discharge of substances of category Z or other noxious substances. For instance, for ships constructed before 2007, the discharge of substances in category Z or other noxious substances is not necessarily made below the waterline[55]; the Administration may waive these requirements for substances in category Z if the distance of the ship is not less than 12 nautical miles from the nearest land where the ship is solely engaged in voyages within waters subject to the sovereignty or jurisdiction of its flag state.[56] Exemption of a prewash may be granted by the government of the receiving state, on request of the ship's master, where it is satisfied that: the unloaded tank to be reloaded with the same substance or another substance compatible with the previous one and that tank will not be washed or ballasted prior to loading; or that the unloaded tank is neither washed nor ballasted at sea; or that the cargo residues will be removed via ventilation procedure.[57]

When a cleaning medium other than water is used for tank washing, its discharge will also be governed by the provisions of either Annex I or Annex II had it been carried as cargo.[58] If small amounts of cleaning additives are added to water in order to facilitate tank washings, additives containing pollution category X components must not be used unless they

[53] Regulation 13.1.
[54] Regulation 13.2.
[55] Regulation 13.2.2.
[56] Regulation 13.2.3.
[57] Regulation 13.4.
[58] Regulation 13.5.

are readily biodegradable and present in a total concentration of less than 10% of the additive.[59]

A tank from which a substance in Category X has been unloaded must be prewashed before the ship leaves the port of uploading. The residues must be discharged to a reception facility until the concentration of the substance in the effluent to such facility is at or below 1% by weight.[60] With regard to a substance of Category Y or Z, the discharge standards in regulation 13.2 apply. A prewash before the ship leaves the port of uploading is required if the unloading of such substance is not carried out in accordance with the Manual.[61] For prewash of high-viscosity or solidifying substances in Category Y, the procedure is set out in Appendix 6; the residue or water mixture generated during the prewash shall be discharged to a reception facility.[62]

Operational requirements for ballasting and deballasting are set out in 7.2 of Regulation 13. Discharge of ballast water after a prewash must follow the standard set out in 13.2.[63] If the ballast contains less than 1 ppm of the substance previously carried by the tank, it is allowed to be discharged into the sea regardless the discharge rate, ship's speed and discharge outlet location, provided that the ship is not less than 12 nautical miles from the nearest land and in water that is not less than 25 metres deep.[64]

Prevention of accidental pollution by NLS is stipulated in Chapter 7. A shipboard emergency plan approved by the Administration is required for ships of 150 GT and above certified to carry NLS in bulk. Detailed requirements for the emergency plan includes: language requirements of the plan; procedure for reporting the pollution incident; the contacts of authorities; detailed description of the action to be taken; and the procedure and point of contact on the ship for coordinating ship-board action.[65]

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[59] Regulation 13.5.
[60] Regulation 13.6.
[61] Regulation 13.6.2.
[62] Regulation 13.6.3.
[63] Regulation 13.7.2.1.
[64] Regulation 13.7.2.2.
[65] Regulation 17.

Chapter 6 sets out the measures of control by port states to ensure the implementation of Annex II. Chapter 8 prescribes the requirements for contracting governments to ensure the availability of adequate facilities in their ports, terminals and repair ports for ships carrying NLS.

Procedures and arrangements Manual and cargo record book are provided in Regulation 14 and 15. Every ship certified to carry substances of Category X, Y, or Z must have on board a Manual approved by the Administration. Every ship must have a Cargo Record Book as well. The forms for the Manual and the Cargo Record Book are specified respectively in Appendix 4 and Appendix 2 to this Annex.

To sum up, MARPOL73/78 Annex II governs the operational discharge of various NLS from ballast water, tank washing residues or mixtures. The specific and stringent standards set out in it afford an effective control of the chemical pollution from operational discharge of vessels. The revised annex includes a number of other significant changes. Improvements in ship technology, such as efficient stripping techniques, has made possible significantly lower permitted discharge levels of certain products which have been incorporated into Annex II.[66] Moreover, some different standards are set out depending on the age of the ship which makes the Annex more practical.

[66] Marine Environment Protection Committee (MEPC) - 52nd session: 11-15 October 2004, "Revised MARPOL Annex I, Annex II and IBC Code Adopted at Environment Meeting" <http://www5.imo.org/SharePoint/mainframe.asp?topic_id=848&doc_id=4405>accessed May 2011.

5 Chinese Legislation

5.1 Background

The People's Republic of China is both a major coastal state and a shipping state. With an eastern continental coastline of some 18 000 km, complemented by a further 14 000 km of coastline around its 6 500 islands[67], China enjoys a great amount of natural resource from the marine environment. Also, as one of the major shipping states, its economic development depends largely on imports and exports trade. In 2010, the total export-import volume was USD29.728 billion[68], most of which was realized by the shipping industry. Besides, being a big oil consumer of the petroleum, China largely depends on imported oil: last year, 239 310 billion tons of crude oil and 36 880 billion tons of refined oil are imported, most of which are carried by marine transportation. [69] The coastline of China has been exposed to great danger of pollution caused by shipping activities including the daily operational discharge of vessels as well as the disastrous oil spill accidents.

To keep the balance between marine transportation and the preservation of the marine environment is of major concern for China to keep sustainable development.

China turned its attention to marine environmental protection after the 1972 United Nations Conference on the Human Environment, though environmental consciousness is deeply rooted in Chinese culture.[70] Since the early 1980's, China has been ratifying marine environment preservation treaties. The conventions China has ratified with regard to the prevention of vessel-source marine pollution within the framework discussed earlier

[67] Hui Yu, in Erik Franckx (ed.), *Vessel-source Pollution and Coastal State Jurisdiction: The Work of the ILA Committee on Coastal State Jurisdiction Relating to Marine Pollution (1991-2000),* (The Hague: Kluwer Law International Press 2001), 201.
[68] National Bureau of Statistics of People's Republic of China, "2010 National Report on Social and Economic Development" <http://www.stats.gov.cn/tjgb/ndtjgb/qgndtjgb/t20110228_402705692.htm> accessed May 2011.
[69] *Ibid.*
[70] Yu, (n. 67), 205.

include: the 1982 UNCLOS, ratified on 7 June 1996; MARPOL 73/78, ratified on 1 July 1983; 1972 Dumping Convention, ratified on 6 September 1985; Intervention Convention ratified on 23 February 1990; 1990 OPRC, ratified in 1999.

The adoption of a convention is only the first step; the next step is to implement those conventions into domestic legislation. As a matter of fact, to harmonize national legislation with international conventions is of more significance. Although China adopted its first regulation *Temporary Regulations on Prevention of Pollution in Coastal Areas*, in 1974, which regulated vessel-source oil pollution at ports, the real systematic work started in 1982, when the *Marine Environment Protection Law* (the 1982 MEPL) was adopted. In order to implement it, a number of regulations and detailed measures were laid down according to the provisions in the 1982 MEPL to govern the various sources of marine pollution, including Regulation Concerning Environmental Protection in Offshore Oil Exploration and Exploitation, 29 December 1983, Regulation Concerning the Prevention of Pollution in Sea Areas by Vessels, 29 December 1983, Regulation Concerning Prevention of Pollution Damage to the Marine Environment by Coastal Construction Projects, 1 August 1990, Regulation Concerning Prevention of Pollution Damage to the Marine Environment by Land-based Pollutants, 1 August 1990, and Regulations Concerning Prevention of Environment Pollution by Ship-breaking, 18 May 1988.[71] Amendment was made to the 1982 MEPL in 1999 with the purpose of its enforcement. 18 years after its adoption, MEPL finally entered into force on 1 April 2000 (it then know as the 2000 MEPL). It is by far the pivotal legislation with respect to protection of the marine environment of China.

Triggered by the amendment and adoption of the 2000 MEPL, legal reform was also made to the vessel-source pollution law in China. The new regulation for control and prevention of vessel-source pollution: *Regulation on Administration of Prevention and Control of Vessels-source Marine*

[71] Yu, (n. 67), 206.

*pollution (*the 2009 Regulation)[72] came into force on 1 March 2010. The regulation is vital to the regime of protection of the marine environment from vessel-source pollution. It will be addressed in the sub-chapter following the discussion of the 2000 MEPL.

5.2 The 2000 MEPL

The 2000 MEPL can be regarded as the implementation of Part XII of UNCLOS into Chinese legislation because most of the Part XII of UNCLOS is carried into it. As Part XII of UNCLOS serves as umbrella in the regime of marine environmental protection, The 2000 MEPL plays the same role in the China's marine environmental protection law. It provides a blueprint for the other detailed regulations with respect to the specific sources of marine pollution. The 2000 MEPL applies to the internal water, territorial sea of China, as well as other sea areas under its jurisdiction and it covers the most common five sources of marine pollution which include coastal construction, offshore oil exploration and exploitation, land-sourced pollutants as well as vessel-source pollution and dumping. The regulations adopted under the MEPL include Regulation Concerning the Prevention of Pollution in Sea Areas by Vessel; Regulation Concerning the Dumping of Wastes at Sea; Regulation Concerning Prevention of Pollution Damage to the Marine Environment by Coastal Construction Projects; Regulations Concerning Prevention of Pollution Damage to the Marine Environment by Land-based Pollutants; Regulations Concerning Prevention of Environmental Pollution by Ship-breaking.[73]

The 2000 MEPL consists of 98 articles within 10 chapters. Chapter I "General Provisions" states the purpose and application scope. Chapter II sets out provisions of marine environmental supervision and management, Chapter III provides for ecological protection. Chapter IV to Chapter VIII set out the regulations for the prevention of pollution from different sources including land-based pollutants, coastal construction projects, dumping of

[72] It also can be translated as "Regulations on Administration of Prevention and Control of Pollution to the Marine Environment by Vessels"; or "Regulations on the Prevention and Control of Ship-Induced Pollution of the Marine Environment".
[73] Yu, (n. 67), 205.

wastes from vessels and their relevant operating activities. Chapter IX sets out the liability and punitive sanction against the polluters. Definitions and explanations are provided at the end. This chapter also declares that the international treaties ratified or acceded to by China shall be applied where their provisions are different from the provisions of the law, except where reservations have been made by China.[74] The discussion here however is confined to prevention of vessel-source pollution which contained in Chapter VII and relevant matters in the first chapter and seventh chapter, i.e., "Prevention of Pollution Damage to the Marine Environment by Vessels and Relevant Operating Activities".

The purpose of the 2000 MEPL as stated in Article 1 is "to protect and improve the marine environment and preserve marine resources, prevent pollution damage, maintain ecological balance, safeguard human health, and promote the sustainable development of the economy and society." It should be noted that the concept of sustainable development was added in the 1999 amendment which represented China' s changed attitude towards the balance of the environment protection and the economy development. Article 2 of the 2000 MEPL prescribes the scope of application. The MEPL governs the internal waters, the territorial sea, the contiguous zone, the EEZ, the continental shelf and other marine areas under China's jurisdiction. Further, it also applies to foreign ships within the navigational areas under China's jurisdiction.

Chapter VIII which contains 10 articles (from Article 62 to Article 72) is of importance for the purpose of discussion as it provides the general provisions for ship-source pollution prevention law and therefore established the foundation for later specific and detailed regulatory legislation with regard to the prevention and control of vessel-source pollution. It regulates all kinds of ships imposes higher (than the1982 MEPL) standards and thus strengthens the protection of the marine environment from vessel-source pollution.[75] The first article in this Chapter (Article 62) lists the operational activities that are under the regulation which include the

[74] The 2000 MEPL, Article 97.
[75] Yu, (n. 67), 211.

discharge of pollutants, wastes, ballast water, vessel garbage and other harmful substances into the sea. Article 63 addresses the documents that vessels are required to possess, including corresponding certificates and documents for the prevention of pollution to the marine environment and factual records in conducting pollutant discharging and other operations. Besides that, all vessels are required to have corresponding equipments and facilities; with regards to those engaged in the business of collection of the pollutants, corresponding capacities for acceptance and treatment is required for the vessel garbage and wastes as well as cabin cleaning and washing.[76] Also, for vessels loaded with cargoes that are pollutants, the structures and equipment of must be able to prevent or reduce pollution to the marine environment by the loaded cargoes.[77]

Article 65 requires vessel to comply with the marine traffic rules so as to prevent pollution resulting from marine accidents such as collisions, strandings, fire or explosion and the like.

Article 66 deals with the general provisions concerning civil liability compensation for damage resulting from vessel-source oil pollution and it also states principles of the joint liability of the ship owner and cargo owner for oil pollution, on which the establishment of the compensation fund and P&I insurance are to be based.

With regard to the potentially polluting cargoes, Article 67 sets the requirement for the prior application to be made for shipping those cargoes; Article 68 addresses the requirements for package, vouchers, marks, and quantities of potentially polluting cargoes to comply with relevant regulations. Moreover, prior assessment is required in certain cases for those dangerous cargoes.

Article 69 requires ports, docks, loading and discharging spots and shipyards to be equipped with proper facilities to cope with pollutants generated from vessels, special plans for dealing with oil spills pollution are specifically required so as to prevent and minimizing accidental oil pollution.

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[76] The 2000 MEPL, Article 62.
[77] The 2000 MEPL, Article 64.

Article 70 recognizes a list of operational activities that can not be carried out without special permission from the relevant department first. These operational activities of vessels include: using incinerators in port waters; cabin washing, gas discharging, ballast water and residual oil discharging, oily water collection, gunwale rust-eradicating and paint coating, etc. in port waters; use of oil detergent chemicals in vessels, docks and facilities; cleaning decks contaminated by pollutants, toxic and harmful substances; ship-to-ship transferring of bulk liquid cargoes that can cause pollution damage, ship dismantling at sea, ship salvaging, sewage of ships, ship repairing and other surface and under-water operations. [78]

In Article 71, the intervention right of the governmental administrative departments is recognized in case of marine casualties causing or possibly resulting in major pollution damage to the marine environment. The governmental administrative department's right to intervene applies to maritime incidents on the high seas when there is possibility of major pollution damage being caused to the sea areas under China's jurisdiction. This provision is in fact the implementation of the 1969 Intervention Convention that China ratified in 1990.

Under Article 72, all vessels have the obligation to supervise pollution at sea, and are obliged to report pollution incidents on discovering them. This obligation to report extends to civil aviation vehicles as well.

In sum, Chapter VIII of the 2000 MEPL covers all aspects of pollution resulting from operational discharge of ships. Some provisions in the 1982 UNCLOS and MARPOL73/78 are incorporated as well. It also contains provisions for prevention of accidental oil pollution from vessels, which reflects the implementation of the Intervention Convention that China ratified. Civil liability provisions are covered as well.

Although only general requirements are stipulated in MEPL, it creates a general legal regime for protection of the marine environment; specific details are supplemented by other regulations generated under it.

[78] The 2000 MEPL, Article 70.

5.3 The 2009 Regulation

Among various regulations developed on the basis of the 2000 MEPL, *Regulations on Administration of Prevention and Control of Pollution to the Marine Environment by Vessels* (the 2009 Regulation), effective on 1 March 2010, is of particular significance for the purpose of discussion in this thesis.

The 2009 Regulation is aimed at both prevention and control of vessel-source pollution. It has created a comprehensive regime for prevention and control of vessel-source pollution.

The regulation regulates both the operational activities of vessels as well as the preventive and controlling measures to be adopted in response to maritime accidents. Liability and compensation issues are covered as well. This not only follows UNCLOS and the 2000 MEPL, but also reflects the guiding ideology of China's marine environment protection policy of prevention, control and compensation.[79]

There are 78 articles contained in nine chapters. Besides the first Chapter "General Provisions" and the last Chapter "Miscellaneous Provisions", the rest of the chapters, namely Chapter II to Chapter VII can be divided into two parts: Chapters II to V address the preventive and control measures and requirements for the vessels and their activities before the marine pollution happens; whereas Chapters VI to VIII deal with investigations after incident, the compensation for the damage resulting from the pollution, and legal liabilities all of which fall in that regime. With regard to the scope of this thesis, only the first five Chapters are of relevance and are therefore discussed in detail.

The main articles of the first five chapters are as follows:

General provisions are provided in the first chapter. Article 1 states the purpose of this regulation which is to prevent and control marine pollution caused by vessels and their operational activities. Article 2 provides for the scope of application of the regulation: it applies to vessels and their operational activities within the sea areas under China' jurisdiction. In other

[79] Nengye Liu, "China's 2009 Regulation on the Prevention and Control of Marine Pollution from Ships", IUCN Academy of Environmental Law e-Journal Vol. 1, 2010, <http://biblio.ugent.be/record/1009473> accessed May 2010.

words, it applies to any ship (including foreign ships) in the internal waters, territorial waters, contiguous zone, EEZ, and continental shelf of China and/or all other sea areas under Chinese jurisdiction. The application scope is in accordance with the 2000 MEPL. However, military vessels are expressly excluded according to Article 3. Article 4 identifies the Maritime Safety Administration (MSA) as the competent department to supervise and administer vessel-source pollution control and prevention. The MSA should also cooperate with the State Oceanic Administration in supervision of vessels and their operational activities.[80] Under Articles 5, 6 and 8, local governments of port cities should build under the auspices of the National Ministry of Transport the response mechanism. Article 8 requires the National Ministry of Transport and governments of port cities to build up a contingency response mechanism including providing corresponding equipment, facilities as well as personnel in cases of pollution emergecy. It is the first time that emergency response to vessel-source pollution clearly becomes a legal responsibility of the Government.[81]

Chapter II deals with prevention and control of marine pollution by vessels and their operational activities. The construction, arrangement and equipment of vessels are required under Article 10 to comply with the requirements in national legislation and international conventions that China has ratified. Corresponding certificates are required under Article 10 as well.

Although no specific requirements are prescribed in this article, requirements regarding vessels' design, construction, arrangement and equipment as well as requirements of certification provided in MARPOL73/78 and its six Annexes will apply, since China has ratified MARPOL73/78 and its six Annexes.[82]

Ship owners, operators and managers must build up a safe operation and vessel-source pollution control system in accordance with the regulation enacted by Ministry of Transport of China.[83] Examination of the safe operation and vessel-source pollution control system is carried out by

[80] The 2009 Regulation, Article 7.
[81] Liu, (n. 79).
[82] China ratified MARPOL73/78 Annex I, II in 1983, Annex III in 1994, Annex IV in 2006, Annex V in 1988 and Annex VI in 2006.
[83] The 2009 Regulation, Article 11.

Maritime Administrative Agency; certificates will be issued by the Maritime Administrative Agency when the operational and prevention systems are approved.[84] Articles 12 and 13 deal with reception facilities of ports, docks, terminals involved in ships' cargo handling, shipyards and entities involved in salvage and ship dismantling. They are required to be equipped with reception facilities, equipment and marine pollution emergency plans regarding the cargoes and vessels they accept. The above articles incorporate the requirements set out in MARPOL.[85]

Chapter III addresses the operational discharges of residues from vessels and reception facilities. Discharges from vessels regulated under Article 15 include vessel-source garbage, sewage, oily water, residues of noxious liquid substances, ballast water and exhaust emissions from vessels. The discharge of the above pollutants must be in compliance with both Chinese legislation and international conventions to which China has become a party. Those pollutants which are not in compliance with the national or international standards are required to be delivered to ports or harbors with adequate reception facilities. Article 16 requires that records shall be made with regard to the discharge of the pollutants mentioned in Article 15. The record shall be kept for two years for discharged garbage and three years for discharged oily wastes and hazardous and noxious waste water. Articles 17, 18 and 19 deal with reception facilities of ports. Companies engaged in the reception of vessel-source pollutants must be approved first by the MSA. The disposal of pollutants must be reported to the MSA monthly as well.

Chapter IV is titled as "Control and Prevention of Marine Pollution from Operational Activities of Vessels". As its title indicates, this chapter deals with the operational activities of vessels including cabin washing, cleaning, bunkering, ballast water and residual oil discharging, oily water collecting, loading and discharging, ship to ship transfer operations, salvage of ships, ship repairing, ship dismantling and other surface and under-water operations. Professional knowledge and skills of safety and pollution

[84] The 2009 Regulation, Articles 11.
[85] See MARPOL Annex II, Regulation 17.

prevention and control are required for the workers conducting such activities.[86] Article 21 to 25 deal with vessels carrying noxious and hazardous cargoes (the polluting cargo list is published by MSA). Vessels engaging carrying those cargoes must comply with the cargo-worthiness requirements and are required to choose ports with adequate reception facilities for discharging and loading as well.[87] Pre- application is required in Article 22 that it must be submitted to the maritime administration by the carrier, cargo owner or their agents to ship polluting cargoes. In Article 24, the requirements for packaging and marking are set out specifically. Article 25 authorizes maritime administrative agency to check cargoes whenever it deems necessary. Article 26 deals with ship-to-ship transferring of NLS in bulks and provides for specific application requirements. This provision is a detailed implementation of Article 70 of the 2000 MEPL in which a list of operational activities (including ship-to-ship transferring of bulk liquid cargoes) that cannot be carried out without special permission from the relevant department is first set out. Articles 27 and 28 prescribe requirements for bunkering while Articles 29 and 30 address ship building and dismantling. In accordance with Article 39 of the MEPL 2000, Article 31 of the 2009 Regulation prohibits vessels from carrying hazardous waste within internal waters, territorial sea and other sea areas under China's jurisdiction. For vessels carrying wastes for the purpose of dumping, pre-application and after-report must be made according to Article 32 to the local maritime administration. The last two articles in Chapter IV, Article 33 and 34 address the issue with regarding pollution cleaning companies. A pre clean-up contract is required for vessels carrying noxious liquid substances and vessels over 10, 000 gross tonnage according to Article 34.

Chapter V focuses on contingency response in cases of accidental pollution from vessels. Pollution incidents in this Chapter mean pollution by oil, oily mixture and other hazardous and noxious substances resulting from marine accidents. Different degrees of pollution accidents are set out in Article 36 according to the amount of oil spilled or direct economic loss

[86] The 2009 Regulation, Article 20.
[87] The 2009 Regulation, Article 21 and Article 23.

resulting from the accident. Further different authorities are identified in Article 39 with respect to the level of the pollution accident. Article 37 prescribes the requirement for marine pollution emergency plan for ships and ports, harbors, the maritime administration and local governments. Report should be made immediately to the nearest maritime administration as required in Article 37; Article 38 specifies the crucial items that should be contained in the report which include the name, nationality and register number of the vessel; information on the shipowner, operator, or manager; details of the accident and the pollutants, as well as the extent of pollution, and the measures taken. This article directly incorporated the requirements of *shipboard marine pollution emergency plan* in MARPOL Annex I and II[88].

Detailed emergency response measures for both the crew of the ships and local governments, maritime administrations, individuals and entities involved in the accident are set out in Articles 40 and 41.

The salient features of the 2009 Regulation are as follows:

The Regulation focuses on both the preventive and controlling aspects of vessel-source pollution which is in accordance with international principles in UNCLOS and MARPOL; Emergency Response Plans are required for both shipowners, operators as well as ports authorities and maritime administrative agencies through the Regulation. It provides for effective control of pollution accidents.

Another important development of this Regulation is the prior-contract requirement prescribed in Article 33 which requires that operators of vessels carrying noxious liquid in bulk and other vessels above 10,000 gross tonnages must sign a pollution cleanup contract with an approved clean up company before entering ports. This requirement again effectively improves the efficiency of response to pollution accidents.

It is worth noting that, the Regulation is not only a specific implementation of the 2000 MEPL, it also incorporates the standards and requirements in the international conventions. Although the Regulation mainly addresses operational discharges from vessels, it covers accidental

[88] See MARPOL Annex II, Regulation 17.

pollution as well as ocean dumping. Moreover, with regards to the operational discharge of vessel, major requirements provided in MARPOL73/78 and Annexes I to V are incorporated in the 2009 Regulation. Some requirements regarding preparedness and in respect of accidental pollution provided in the Convention OPRC are implemented through the Regulation as well.[89]

For instance some ports still lack reception facilities. Since 1986, according to the Annual Reports of Implementation of MARPOL73/78 in China, the third part regarding reception facilities has always been blank.[90] It is foreseeable that this problem may be solved if Article 19 of this new Regulation can be enforced properly in the future.[91]

In summary, the 2009 Regulation provides detailed and clear operational instructions for vessel-source pollution control and prevention. Although there is scope for improvement, it has provided a comprehensive structure for vessel-source pollution prevention law in China.

[89] ITOPF, "ITOPF Handbook" November 2010 <http://www.scribd.com/doc/49573760/19/OPRC-Convention> accessed May 2011.
[90] H. Lao, "Good Work Requires Good Tools: How are We Going to Deal with the Entry into Force of MARPOL73/78 and its Annex", (2008) 8 China Maritime Safety 4, as cited from Liu, (n. 79).
[91] Liu, (n. 79).

6 Conclusion

6.1 Summary

To balance economic development and preservation of environment is a lasting issue that society must consider so as to pursue a long term development. As far as the marine environment is concerned, because we depend largely on the oceans, it is necessary to take adequate measures to protect the marine environment.

In this thesis, the subject of control and prevention of vessel-source pollution has been examined against the background of protection of the marine environment. Vessel-source pollution as one of the major threats to the ocean is adequately regulated by a legal framework created by international law. As pointed out, the legal framework consists of three dimensions namely public international law, regulatory maritime law, and international private law. Regarding the preventive law of vessel-source pollution, only the public international law and regulatory maritime law are addressed. These two dimensions are examined with a detailed discussion of selected conventions. In the public law domain, UNCLOS is of utmost importance in providing a legal framework for regulation of vessel-source pollution including prevention and control of operational discharges from ships, accidental pollution from ships as well as ocean dumping. Under this framework, major international regulatory laws have been developed. Another important convention in the public law domain is the 1969 Intervention Convention which specifies states' obligations in cases of oil pollution accidents on the high seas. Although it is said to be victim (coastal states) oriented[92] by giving rights to coastal states in unilateral intervention on the high seas in cases of marine pollution casualties, it does provide an effective and efficient means of control for vessel-source pollution resulting from incidents.

[92] Emanuelli, (n. 44), 95.

In the regulatory law regime, IMO conventions undoubtedly play a vital role. MARPOL 73/78 which is entirely preventive law in scope is by far the most important one among all the marine pollution conventions.[93] Therefore a detailed study of Annex II of MARPOL 73/78 has been done so as to afford a clear understanding of regulatory international law regarding prevention of operational pollution from vessels.

As mentioned above, the degree of effectiveness of international instruments depends on enforcement. More specifically, it relies on national legislation and enforcement practices of the contracting states. Case studies with respect to the harmonization of national legislation with international law are necessary. In this thesis, China is chosen as unit of analysis of the implementation of the above mentioned international law into national legislation. China being a coastal and shipping state has ratified most of the international conventions with respect to the preventive law of vessels-source pollution. Two most important pieces of legislation in this respect namely the 2000 MEPL and the 2009 Regulation, are examined in contextual detail.

As discussed, the 2000 MEPL provides general principles and requirements for the protection of the marine environment in which vessel-source pollution prevention law is included as a major aspect. The 2009 Regulation generated on the foundation of the 2000 MEPL is designed specifically for the implementation of MARPOL73/78 and its annexes in China.

6.2 Conclusion

In conclusion, it can be stated that there has been adequate international law in the regime of prevention and control of vessel-source pollution. A comprehensive and systematic legal framework has been embodied in various international conventions. Almost every aspect of the problem of vessel-source pollution is covered by those legal instruments, though there

[93] Xu, (n. 40), 428.

is still room for further improvement. Future development may be expected with the advances in construction and design of ships, navigation technology as well as the new generation of potentially polluting cargoes. Still efforts are needed to strengthen the international regulatory framework and formulating robust as well as practical measures to ensure sustainable development of the maritime sector and the global economy.[94]

In the opinion of this writer, the implementation and enforcement of legal instruments is of no less significance than legislation. In respect of the legal framework discussed in this thesis, the public and regulatory law has provide instruction for both shipping industry, public authorities and international organizations to adopt measures for exercising and enforcing the vessel-source pollution control and prevention law. However, more work has to be done in facilitating the implementation and enforcement of those international instruments by more states. As international treaties do not provide for inducements or incentives for state parties to effectively implement them, nor is there any supranational enforcement body.[95] Problems still exist in achieving a desirable result internationally.

At the international level, the costly operational and structural requirements prescribed in the regulatory conventions still pose a great burden on developing countries with large tonnages and those major ship registries as well as second-hand ships receivers. Therefore more effort is needed by the international maritime community to promote international co-operation between well developed and less developed countries, especially in technical and financial support for the less developed states, so as to achieve international success in the prevention and control of vessel-source pollution.

In the case of China, both economic development and a sound environment are of grave importance. A big step has been made by adopting

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[94] M Segar Abdullah, "Environmental Challenges for Shipping and Port Activities" in Neil Bellefontaine and Olof Linden (eds.), *Impacts of Climate Change on the Maritime Industry* (Malmö: World Maritime University 2008), 55.

[95] Proshanto K. Mukherjee and Jingjing Xu, "The Legal Framework of Exhaust Emissions from Ships: A selective Examination from a Law and Economics Perspective" in Neil Bellefontaine and Olof Linden, (eds.), *Impacts of Climate Change on the Maritime Industry* (Malmö: World Maritime University 2008), 95.

much national legislation for the purpose of implementing international maritime law. However, there are problems in practice with respect to the actual exercising of those requirements set out in those laws.

To achieve a solution to the existing problems, the writer submits that from a national perspective of China, stringent supervision and sanction mechanisms are required for the public authorities of China in order to enforce the law; from an international perspective, more regional and international cooperation with other states and support from international maritime community, especially from developed states in aspects of technology development and financial assistance will be appreciated for China to achieve a sound and effective mechanism for vessel-source pollution control.

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International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004, (BMW)

International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (AFS)

International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996, (HNS)

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