International Legal Framework on the Prevention of Vessel-Sourced Pollution

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Abstract: This paper examines the international legal framework of the prevention of vessel-source marine pollution. It provides an overview of current international framework. First, the study introduces International Maritime Organization (IMO) and the Law of the Sea Convention (LOSC). Second, it analyzes the relation between Conventions adopted under the auspices of the IMO (IMO Conventions) and the LOSC. Third, it discusses major IMO Conventions dealing with prevention of vessel-source pollution. Finally, this paper addresses challenges of the international legal framework.

Key words: Vessel-source pollution; Freedom of navigation; IMO; Law of the Sea

Ⅰ. Introduction

Nowadays, the protection of the marine environment is one of the most important ecological issues, next to climate change effects and freshwater scarcity. However, nearly 30 years after the adoption of the United Nations Convention on the Law of the Sea (LOSC),[①] the state of the world's oceans con-

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① The Third United Nations Conference on the Law of the Sea (UNCLOS III) was convened in New York in 1973. It ended nine years later with the adoption in 1982 of a constitution for the seas—the United Nations Convention on the Law of the Sea. *See* United Nations Division for Ocean Affairs and the Law of the Sea (DOLAS), *United Nations Convention on the Law of the Sea (a historical perspective)*, at http://www.un.org/Depts/los/convention_agreements/convention_historical_perspective.htm # Historical%20Perspective, 1 May 2011.

tinues to deteriorate.[①] Global climate change is also further exacerbating adverse impacts on coastal and ocean ecosystems, partly caused by green house gas (GHG) emission from shipping.

The LOSC distinguishes sources of marine pollution as land-based activities, dumping, vessels, sea-bed activities, activities in the area, and those from or through the atmosphere. Maritime transport is only responsible for some 12% of the total.[②] However, this pollution often affects more than one single state. Furthermore, shipping is an activity with intensive communication between different states and individuals and is regulated by international conventions and the United Nations Convention on the Law of the Sea (LOSC).[③] Except LOSC, vessel-source pollution is mainly governed by conventions concluded under the auspices of the International Maritime Organization (IMO Conventions). On the international level, standard-setting efforts to prevent vessel-source pollution are mainly focused on the discharge and emission standards, construction, design, equipment and manning (CDEM) standards and Navigational standards.[④] The IMO has established a series of conventions, including the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL), the International Convention for the Safety of Life at Sea (SOLAS), the International Convention on the Control of Harmful Anti-fouling Systems on Ships (Anti-Fouling Convention) and the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention). In addition, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention) regulates hazardous wastes carried by ships.

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① United Nations Convention on the Law of the Sea 20th Anniversary (1982—2002), *Oceans: The Source of Life*, p. 3, at http://www.un.org/Depts/los/convention_agreements/convention_20years/oceanssourceoflife.pdf, 1 May 2011.

② Shipping Facts, at http://www.marisec.org/shippingfacts/environmental/small—contribution—to—overall—marine—pollution.php, 2 May 2011.

③ Erik Jaap. Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution*, Hague: Kluwer Law International, 1998, pp. 18-19.

④ *See* Erik Jaap. Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution*, Hague: Kluwer Law International, 1998, pp. 21-25.

Vessel-source pollution can be either accidental or operational pollution. [①] Although accidental pollution is the most well-known due to several oil tanker spills (*Torrey Canyon* (1967), *Amoco Cadiz* (1987), *Exxon Valdez* (1989), *Erika* (1999) and *Prestige* (2002), it contributes a relatively small part to the total marine pollution caused by vessels. This paper focuses on the international legal framework of the prevention of vessel-source pollution, especially its fast development and challenges in the last decade. It is also an attempt at providing a better understanding of the international legal regime.

Ⅱ. IMO and the Law of the Sea Convention

A. *International Maritime Organization*

The United Nations and related international organizations ha the ability to influence the international policy-making agenda, and to initiate or facilitate many of the most important law-making developments. [②] This is the case for the IMO. The main purposes of the IMO are to provide a platform for co-operation among governments in the field of governmental regulation and practices related to technical matters of all kinds affecting shipping engaged in international trade; to encourage and facilitate the general adoption of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and prevention and control of marine pollution from ships. [③] Originally the functions of the IMO were to be only "consultative and advisory." With the entry into force of the 1982 amendments to the Convention on the International Maritime Organization (IMO Convention), the IMO can also perform functions "assigned to it by or under international instruments relating to maritime matters and the effect of shipping on the marine environment." [④] The expression "competent international organization" in singular in the United Nations Law of the Sea Convention (LOSC) applies exclusively to the IMO, bear-

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① *See* Erik Jaap. Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution*, Hague: Kluwer Law International, 1998, p. 20. Molenaar distinguishes vessel-source pollution into three types: accidental, operational and vessel-source air pollution. However, the author believes that air pollution is also emitted during the operation of a vessel and thus should be treated as operational pollution too.

② Patricia Birnie and Alan Boyle, *International Law and The Environment*, 2nd ed., Oxford: Oxford University Press, 2002, p. 35.

③ Art. 1(a), Convention on the International Maritime Organization.

④ Art. 2(d) of the IMO Convention.

ing in mind the global mandate of the Organization as a specialized agency within the United Nations system established by the IMO Convention. ①

Nowadays, the IMO has six main bodies concerned with the adoption or implementation of conventions. The Assembly and Council are the main organs, and committees involved are the Maritime Safety Committee (MSC), the Marine Environment Protection Committee (MEPC), the Legal Committee and the Facilitation Committee. The formal sessions of negotiating committees involve debates and decisions, but the general IMO approach is to establish treaties by consensus. ② After the adoption of a convention, sometimes it still takes long time to wait for its enforcement. Each convention has to meet certain conditions in order to come into force. In general, there are various conditions, but the two main issues are the number of ratifications and the representative of world's gross tonnage. They become more stringent depending on the complexity of the document. ③The IMO has improved its procedures over the years to ensure that changes can be introduced more quickly after the adoption of legally binding international instruments, mainly annexes to conventions. One of the most successful of these has been the process known as "tacit acceptance". It means that the body which adopts the amendment to an annex by a majority vote determines the start of enforcement and the time within which the contracting parties have the opportunity to notify their rejection of the amendment. A decision taken by majority will be binding for States that did not support the decision, unless they explicitly opt out within the foreseen period. In case there are no objections the amendment is considered accepted by the party. ④ The procedure is so popular that it is incorporated in many important IMO conventions such as MARPOL and SOLAS.

The enforcement of IMO conventions depends on member States. According to the LOSC, the States should control and set penalties for ships flying their own flags or of their registry. Moreover, port States and coastal States also have certain powers for regulating foreign vessels, which will be discussed

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① IMO LEG/MISC/6, 10 September 2008, Implications of the United Nations Convention on the Law of the Sea for the International Maritime Organization, a study by the Secretariat of the IMO, 7.

② Nicholas Gaskell, Decision Making and the Legal Committee of the International Maritime Organization, *International Journal of Marine and Coastal Law*, vol. 18, 2003, p. 186.

③ Z. Oya Ozcayir, IMO Conventions: The Tacit Consent Procedure and Some Recent Examples, *Journal of International Maritime Law*, vol. 10, 2004, p. 205.

④ IMO LEGXII / 8 Annex II, 8.

below.

B. The Law of the Sea Convention

Called by Tommy Koh, President of the Third United Nations Conference on the Law of the Sea, as "A Constitution for the Oceans," the LOSC was signed on 10 December 1982 and enforced on 28 July 1996. ① The regime for preventing vessel-source pollution is aptly described in the Part XII of LOSC as "Protection and Preservation of the Marine Environment," Part II "Territorial Sea and Contiguous Zone" and Part V "Exclusive Economic Zone." In the LOSC, legislative or enforcement jurisdiction that a State has in respect of a particular vessel varies depending on whether it is a flag, coastal or port State. ② The LOSC allocated State jurisdiction among flag, coastal and port States, thus created a jurisdictional regime and a safety net for the prevention of vessel-source pollution. The jurisdictional regime attempts to balance the interests of flag States in a system which safeguards the freedom of navigation and is globally uniform. It also takes into account the interests of coastal States which can exercise jurisdiction for the protection and preservation of the marine environment. ③ It reflects a carefully balanced compromise between States with maritime interests and States with coastal interests. ④

The flag States' duty to exercise effective prescriptive and enforcement ju-

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① *See* http://www.un.org/Depts/los/convention_agreements/convention_historical_perspective.htm#Historical%20Perspective, 3 May 2011.

② Robin Rolf Churchill and Alan Vaughan Lowe, *The Law of the Sea*, 3rd ed., Manchester: Manchester University Press, 1999, p. 344. Flag State is the State whose nationality a particular vessel has. LOSC does not define "port" or "coastal" State. According to Churchill and Lowe, coastal State is the State in one of whose maritime zones a particular vessel lies; port State is the State in one of whose ports a particular vessel lies. However, Molenaar thinks that account should not only be taken of the type of enforcement (in-port or at sea), but also the locus of the violation and the type of standard subject to enforcement. What should nevertheless be clear is that port or coastal State jurisdiction always implies jurisdiction over foreign vessels. *See* Erik Jaap. Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution*, Hague: Kluwer Law International, 1998, pp. 92-93.

③ *See* Erik Jaap. Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution*, Hague: Kluwer Law International, 1998, p. 135.

④ *See* Robin Rolf Churchill and Alan Vaughan Lowe, *The Law of the Sea*, 3rd ed., Manchester: Manchester University Press, 1999, p. 346.

risdiction over its ships is laid down in general terms in Art. 94 (1). ①② According to Art. 211 of LOSC, flag States are required to enact legislation that "shall at least have the same effect as" that of generally accepted international rules and standards. International standards therefore only form a minimum threshold for legislative jurisdiction of flag States. When it comes to enforcement jurisdiction, Art. 217 provides that flag States must enforce violations of pollution laws applying to their ships wherever committed. Moreover, under Art. 228, if the flag State institute its own proceeding, any coastal State shall suspend its proceedings to impose penalties with respect to any violation of applicable laws and regulations or international rules and standards related to the prevention, reduction and control of pollution from vessels committed by a foreign vessel beyond its territorial sea. The LOSC provides Flag States with the main duty to prevent vessel-source pollution. However, in reality, the effectiveness of flag States jurisdiction is always not satisfactory. ③ It still needs coastal States and port States jurisdiction to enhance the so-called safety net on the prevention of vessel-source pollution.

With respect to coastal State jurisdiction, it varies in different maritime zones divided by the LOSC. ④ For the legislative jurisdiction, the coastal State may adopt laws and regulations in the territorial sea without hampering innocent passage of foreign vessels for protecting marine environment (Art. 21

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① It reads that every State shall effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag.

② For a recent analysis of flag State jurisdiction, *see* Nivedita M. Hosanee, A Critical Analysis of Flag State Duties as Laid Down under Article 94 of the 1982 United Nations Convention on the Law of the Sea, at http://www.un.org/Depts/los/nippon/unnff_programme_home/fellows_pages/fellows_papers/hosanee_0910_mauritious.pdf, 5 May 2011.

③ For the lack of incentives for flag State enforcement, *see* Alan Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation*, Cambridge: Cambridge University Press, 2006, pp. 47-61. *See* also, Awni Behnam and Peter Faust, Twilight of Flag State Control, *Ocean Yearbook*, vol. 17, 2003, pp. 167～192.

④ For more discussion, *see* Christopher P. Mooradian, Protecting "Sovereign Rights": The Case for Increased *Coastal State Jurisdiction over Vessel-Source Pollution* in the Exclusive Economic Zone, *Boston University Law Review*, vol. 82, 2002, pp. 767-816. Julian Roberts and Martin Tsamenyi, The Regulation of Navigation under International Law: a Tool for Protecting Sensitive Marine Environments, in Tafsir Malick Ndiaye and Rudiger Wolfrum ed., *Law of the Sea, Environmental Law and Settlement of Disputes: Liber Amicorum Judge Thomas A. Mensah*, Leiden: Martinus Nijhoff Publishers, 2007, pp. 787-810. *See* also Erik Jaap. Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution*, Hague: Kluwer Law International, 1998, pp. 18-19.

(1)). However, such laws and regulations cannot apply to design, construction, manning or equipment (CDEM) of foreign ships unless they give effect to generally accepted international rules or standards (Art. 21 (2)). In the Exclusive Economic Zone (EEZ), the coastal State legislative jurisdiction is even more restricted. Under Art. 211 (5) a coastal State may adopt pollution legislation for its EEZ which conforms and gives effect to "generally accepted international rules and standards established through the competent international organization or general diplomatic conference."

As for the enforcement, coastal States are governed by Art. 220 of the LOSC. When there are clear grounds for believing that a foreign vessel navigating in the territorial sea has violated laws and regulations of that coastal State, costal States may undertake physical inspection of the vessel and may, when the evidence so warrants, institute proceedings, including detention (Art. 220(2)). When an alleged violation happened in the EEZ, coastal States may require the vessel within its territorial sea or EEZ to give information regarding its identity and port of registry, its last and next port of call and other relevant information required to establish whether a violation has occurred (Art. 220 (3)). If the violation in the EEZ has resulted in "a substantial discharge causing or threatening significant pollution of the marine environment," the coastal State may undertake physical inspection of the vessel for matters related to the violation if the vessel has refused to provide information or if the given information is manifestly incorrect (Art. 220 (5)). In case the violation has resulted in "a discharge causing major damage or threat of major damage to the coastline or related interests of the coastal State, or to any resources of its territorial sea or EEZ," the coastal State may institute proceedings, including detention of the vessel (Art. 220 (6)). Nevertheless, terms like "substantial discharge" and "major damage" are quite vague.

The most radical innovations made to the enforcement of marine pollution standards by the LOSC concern the powers given to port States.[①] Ports lie wholly within a state's territory and therefore fall under its territorial sovereignty. Customary international law acknowledges a port state's wide discretion in exercising jurisdiction over its port.[②] The International Court of Justice

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① *See* Robin Rolf Churchill and Alan Vaughan Lowe, *The Law of the Sea*, 3rd ed., Manchester: Manchester University Press, 1999, p. 350.

② Erik Jaap. Molenaar, Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage, *Ocean Development & International Law*, vol. 38, 2007, p. 227.

in the Nicaragua case states that it is by virtue of its sovereignty that the coastal state may regulate access to its ports. ① This is implicitly confirmed by Art. 25 (2), 211 (3) and 255 of the LOSC. It is generally agreed that a vessel's right of access to ports is only a presumption, not an obligation for port states. ② This provides a legal basis for port State Jurisdiction. Port State Jurisdiction and Port State Control are different. Port State Jurisdiction concerns the port State's powers to investigate ships and impose fines on them for violation of international rules and standards. In the full sense of port State jurisdiction, it also relates to prosecution for offences committed beyond the maritime zones of the (coastal) state under Art. 218 of the LOSC. With Port State Control, the port State limits itself in taking an administrative measures of control, such as detaining a ship in port until various corrective measures have been taken or ordering it to proceed to the nearest shipyard for repairs. ③ Under Art. 218 of the LOSC, ④ the port State has jurisdiction (optional, not mandatory) over any discharge/offence from a vessel, even when it occurs outside its internal waters, territorial sea or EEZ, and if applicable international rules and standards like MARPOL are violated. ⑤

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① Case concerning Military and Paramilitary Activities In and Against Nicaragua (Nicaragua v. United States of America), [1986] I. C. J. Rep., at. 111, para. 123.

② *See* Erik Jaap Molenaar, Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage, *Ocean Development & International Law* vol. 38, 2007, p. 227. *See* also Louis De La Fayette, Access to Ports in International Law, *International Journal of Marine and Coastal Law*, vol. 11, 1996, pp. 1-21. Ted L. McDorman, Regional Port State Control Agreemtns: Some Issues of International Law, *Ocean and Coastal Law Journal*, vol. 5, 2000, pp. 217-218.

③ Ho-Sam Bang, Is Port State Control an Effective Means to Combat Vessel-Source Pollution? An Empirical Survey of the Practical Exercise by Port States of Their Powers of Control, *International Journal of Marine and Coastal Law*, vol. 23, 2008, p. 717. For details about Port State Control, *see* Z. Oya Ozcayir, The Use of Port State Control in Maritime Industry and Application of the Paris MOU, *Ocean and Coastal Law Journal*, vol. 14, 2008—2009, pp. 201-239. *See* also, Z. Oya Ozcayir, *Port State Control*, LLP, 2001.

④ A Critique of Art. 218, *see* H. S. Bang, Port State Jurisdiction and Article 218 of the UN Convention on the Law of the Sea, 40 (2009) 291—309.

⑤ Michael G. Faure and James Hu, *Prevention and Compensation of Marine Pollution Damage: Recent Development in Europe, China and the US*, Alphen aan den Rijn: Kluwer Law International, 2006, p. 46.

Ⅲ. IMO Conventions Interface with the Law of the Sea Convention

As defined by Shabtai Rosenne, the IMO interface with the LOSC. Interface means that independent and often incompatible systems interact or communicate with each other. ①

A. Historical Overviews ②

There are four main periods in the evolution of the interrelation between the IMO safety and antipollution regulations and development of the LOSC. From 1959 to 1973, intense treaty making was in progress at the IMO without any comprehensive law of the sea treaty framework. Between 1973 and 1982, UNCLOS III was in parallel to the adoption of the most important IMO treaties. From its adoption until its enforcement (1992—1994), the LOSC served as an important reference to the on-going regulatory work undertaken by the IMO. The last period is from 1994 to present, which features the dynamic interaction between the LOSC in force and the IMO treaties.

B. Binding Nature of the LOSC references to IMO Regulations

In terms of State jurisdiction, the LOSC defines the features and extent of the concepts of flag, coastal and port State jurisdiction, while the IMO instruments specify how State jurisdiction should be exercised to ensure compliance with safety and antipollution shipping regulations. ③

The LOSC is acknowledged to be an "umbrella convention" because most of its provisions, being of a general kind, can be implemented only through spe-

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① Myron H. Nordquist and John Norton Moore ed., *Current Maritime Issues and the International Maritime Organization*, Leiden: Martinus Nijhoff Publishers, 1999, p. 251.

② For details, *see* Augustin Blanco-Bazan, IMO Interface with the Law of the Sea Convention, at http://www.imo.org/INFOrESOURCE/mainframe.asp? topic_id=406&doc_id=1077, 11 May 2011. *See also* Erik Jaap. Molenaar, Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage, *Ocean Development & International Law*, vol. 38, 2007, pp. 269-275.

③ LEG/MISC/6, 10 September 2008, Implications of the United Nations Convention on the Law of the Sea for the International Maritime Organization, a study by the Secretariat of the IMO, p. 13.

cific operative regulations in other international agreements. [①] Several provisions of the LOSC require States to "take into account," "conform to," "give effect to" or "implement" relevant international rules or standards which are referred to as "applicable international rules and standards," "internationally agreed rules, standards, and recommended practices and procedures," "generally accepted international rules and standards," "generally accepted international regulations," "applicable international instruments" or "generally accepted international regulations, procedures and practices" developed by or through the "competent international organization (IMO)." These provisions clearly establish an obligation for the LOSC States Parties to apply IMO rules and standards. However, two questions are raised. Firstly, whether parties to the LOSC should implement generally accepted IMO rules and standards irrespective of whether they are or not party to the treaty where these rules and standards are contained. Secondly, the first question also results in confusion for the meaning of "general."

The first question is about "incorporation by reference." [②] It can be argued that it is irrelevant for States parties to the LOSC to become parties to basic IMO treaties since the LOSC includes obligations to comply with all generally accepted IMO rules and standards. However, the problem is that this interpretation will encourage many States seek to enforce IMO rules and standards in respect of foreign vessels as national legislation without complying with their obligations, e. g. without providing the corresponding reception facilities prescribed by MARPOL. Moreover, the LOSC obligations to apply IMO rules and standards should not be considered in a unilateral way, otherwise it will break the treaty law structure and the legal certainty. Furthermore, since the "umbrella" provisions are different from the extremely precise IMO regulations, a violation of MARPOL rules absolutely can not be treated as a violation of the LOSC.

The need to consider IMO rules and standards intrinsically associated with the treaty in which they are contained is also relevant for consistent legal inter-

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① LEG/MISC/6, 10 September 2008, Implications of the United Nations Convention on the Law of the Sea for the International Maritime Organization, a study by the Secretariat of the IMO, p. 8.

② The method of making one document of any kind becomes a part of another separate document by alluding to the former in the latter and declaring that the former shall be taken and considered as a part of the latter the same as if it were completely set out therein.

pretation of the requirement of their "general acceptance."[①] It was well analyzed in the London 2000 Conference Report, put together by the Former Committee on Coastal State Jurisdiction Related to Marine Pollution of the International Law Association. According to the report, the purpose of the concept of "generally accepted international rules and standards" within the framework of the LOSC is to give expression to the "umbrella" function of Part XII, which aims at securing the primacy of international rules and standards over national laws and regulations.[②] Based on the drafting history of the notion of generally accepted international rules and standards, the application of this concept to the environmental sphere in the 1982 Convention is believed to retain the same ultimate objective, namely to make compulsory for all states certain rules which had not taken the form of an international convention in force for the states concerned, but which were nevertheless respected by most states. Generally accepted international rules and standards cannot be equated with customary law or with legal instruments in force for the states concerned. Instead, they are primarily based on state practice, attaching only secondary importance to the nature and status of the instrument containing the respective rule or standard.[③]

C. Environmental LOSC and IMO rules and standards

For the protection of marine environment, the LOSC as "umbrella convention" has been greatly altered in Part XII, which includes specific provisions of an operative kind and can be directly implemented. Therefore, these provisions can be interpreted together with IMO treaties, especially MARPOL.

Both the LOSC and the MARPOL are dealing with the protection of marine pollution by ensuring that anti-pollution preventative measures are properly implemented. However, while the LOSC focuses more on illegal discharge, the MARPOL also pays attention to Construction, Design, Equipment and Manning (CDEM) measures on board irrespective of whether discharges take place or not. The distinction has important consequences in connection with

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① *See* Myron H. Nordquist and John Norton Moore ed., *Current Maritime Issues and the International Maritime Organization*, Leiden: Martinus Nijhoff Publishers, 1999, p. 282.

② Conference Report London 2000, pp. 31-32, at http://www.ila-hq.org/en/committees/index.cfm/cid/12, 13 May 2011.

③ Conference Report London 2000, p. 34, at http://www.ila-hq.org/en/committees/index.cfm/cid/12, 13 May 2011.

the application of penalties.[①] According to Art. 230 of the LOSC, penalties other than monetary ones can be imposed only in case of "a willful and serious act of pollution in the territorial sea." In other words, violations of MARPOL rules resulting in substandard navigation without both willful misconduct and polluting discharges can be sanctioned only with monetary penalties.

Ⅳ. Post—UNCED

Since the 1992 United Nations Conference on Environment and Development (UNCED), two important treaties have been adopted: the Convention on Biological Diversity (CBD) and the United Framework Convention on Climate Change (UNFCCC). The UNCED has also issued two non-binding documents: the official Declaration of the Conference (Rio Declaration) and Agenda 21. These instruments have now entered into the process of international law-making. They are being applied in various formulations throughout the UN system and in all bodies involved in environmental protection, including protection of marine environment and achievement of sustainable development outside this system, as well as in States' national legislation.[②] The international law on the protection of marine environment lies in an overlapping area between the law of the sea and the international environmental law, containing elements of each and belonging to both.[③]

As the general terms in the Part XII of LOSC require interpretation and further development, they now should be interpreted in the context of the UNCED principles, which aim at achieving the general notion of "sustainable development."[④] The precautionary principle has also been applied in the field of marine environment protection as part of international environment law.[⑤]

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① *See.* Myron H. Nordquist and John Norton Moore ed., *Current Maritime Issues and the International Maritime Organization*, Leiden: Martinus Nijhoff Publishers, 1999, p. 285.

② *See.* Myron H. Nordquist and John Norton Moore ed., *Current Maritime Issues and the International Maritime Organization*, Leiden: Martinus Nijhoff Publishers, 1999, p. 361.

③ Louis De La Fayette, The Marine Environment Protection Committee: The Conjunction of the Law of the Sea and International Environmental Law, *The International Journal of Marine and Coastal Law*, vol. 16, 2001, p. 158.

④ *See.* Myron H. Nordquist and John Norton Moore ed., *Current Maritime Issues and the International Maritime Organization*, Leiden: Martinus Nijhoff Publishers, 1999, p. 362.

⑤ Benedicte Sage, Precautionary Coastal States' Jurisdiction, *Ocean Development and International* Law, vol. 37, 2006, pp. 359-371. *See* also David Vanderzwaag, The Precautionary Principle and Marine Environmental Protection: Slippery Shores, Rough Seas, and Rising Normative Tides, *Ocean Development and International* Law, vol. 33, 2002, pp. 165-188.

Moreover, the IMO has both the institutional machinery and powers necessary to fulfill most of the demands resulting from the application of the Rio Declaration, Agenda 21 and the new convention, if its Member States are willing to use them for these purposes. ①

Ⅴ. IMO Conventions

A. MARPOL 73/78

Art. 211(1) of the LOSC lays down a general obligation for states, acting through the competent international organization (IMO) or general diplomatic conference, to establish international rules and standards regarding vessel-sourced pollution, and to re-examine them from time to time as necessary. The main IMO treaty in this area is MARPOL, which is a combination of two treaties adopted in 1973 and 1978 respectively and updated by amendments through the years. Art. 2 (2) and (3) of MARPOL includes a definition of "harmful substances" which is entirely compatible with the definition of "pollution of the marine environment" included in article 1(4) of LOSC. Both definitions refer to the introduction of substances into the marine environment which results or can result in hazards to human health, harm to resources and hindrance to legitimate use of the sea. While the definition included in the LOSC applies to all sources of marine pollution, the MARPOL deals only with pollution from vessels and accordingly includes a definition of "discharges" from ships.

The enforcement of MARPOL relies primarily on the exercise of flag State jurisdiction regarding the features of CDEM of ships. The MARPOL also includes regulations on the inspection of foreign ships voluntarily in port to ensure that they comply with antipollution rules and standards and to prevent the ship from sailing if these requirements are not met. Furthermore, the MARPOL entitles port States to institute proceedings in accordance with their law. Provisions on the institution of proceedings in this regard should be read together with the regulations included in Art. 228 of the LOSC.

The MARPOL and its amendments cover all technical aspects to prevent and reduce pollution from ships, except the disposal of waste into the sea by dumping, and apply to ships of all types, although it does not apply to pollution

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① *See.* Myron H. Nordquist and John Norton Moore ed., *Current Maritime Issues and the International Maritime Organization*, Leiden: Martinus Nijhoff Publishers, 1999, p. 369.

from offshore exploration and exploitation. The MARPOL has two Protocols dealing with Reports on Incidents involving Harmful Substances and Arbitration, and six Annexes that contain regulations for the prevention of various forms of pollution:

Annex I deals with pollution by oil. It introduces discharge limits for oil and oil contaminated water from ships of more than 400 tons gross tonnage; equipment regulations to fulfil he discharge standards (15 ppm oil-discharge monitoring and control system, oil-water separating equipment and a filtering system, slop tanks, sludge tanks, piping and pumping arrangements separated from the cargo pipes); technical standards for oil tankers to limit oil spills after an accident-collision, stranding or grounding — such as subdivision of cargo spaces; damage stability requirements and the double hull concept; segregated ballast tanks (SBT) and dedicated clean ballast tanks (CBT) to avoid ballasting in tanks used for oil cargo; crude oil washing (COW) instead of water washing; and an International Oil Pollution Prevention Certificate (IOPPC).

Amendments to the MARPOL imposing double hull or equivalent design requirements for oil tankers delivered on or after 6 July 1996 were adopted by the IMO on 6 March 1992 and enforced on 6 July 1993. Within these amendments, a phasing-out scheme for single hull oil tankers delivered before that date took effect from 6 July 1995 requiring tankers delivered before 1 June 1982 to comply with the double hull or equivalent design standards not later than 25 years and, in some cases, 30 years after the date of their delivery. Such existing single hull oil tankers would not be allowed to operate beyond 2007 and, in some cases, 2012 unless they comply with the double hull or equivalent design requirements of Regulation 13F of Annex I of MARPOL 73/78. For existing single hull oil tankers delivered after 1 June 1982 or those delivered before 1 June 1982 and which are converted, complying with the requirements of MARPOL 73/78 on segregated ballast tanks and their protective location, this deadline would be 2026 at the latest. [①] After the "Erika" disaster in 1999 the European Union (EU) believes that the normal framework for international action on maritime safety under the auspices of the International Maritime Organization falls short of what is needed to tackle the causes of such disasters ef-

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① Regulation (EC) No 417/2002 (On the accelerated phasing-in of double hull or equivalent design requirements for single hull oil tankers and repealing Council Regulation (EC) No 2978/94), O. J. L 64, 7. 3. 2002, 2.

fectively. ① The EU decided to accelerate phasing out single hull tankers internally. As part of the Erika I package Regulation (EC) No. 417/2002 was adopted (Art. 3, 4) with deadlines for three categories of single hull tankers. Meanwhile, member States submitted a joint proposal to the IMO with the intention to amend the MARPOL. Despite facing controversial debate, the EU's joint proposal was passed finally and MARPOL was amended in 2001, adopting the same deadlines as the EU for phasing out single hull tankers. In 2003 in the aftermath of the "Prestige" disaster, the EU enacted Regulation (EC) No. 1726/2003, which for the second time accelerated the deadlines set by Regulation (EC) No. 417/2002. Subsequently, a joint proposal from EU Member States was on the table of IMO for decision-making. It was extensively discussed at the 50th MEPC and raised great concern from the outside world. Concerns were raised that the EU's unilateral approach undermined the authority of the IMO and created pressure for other countries, especially developing countries. However, once again the IMO accepted the EU Member States' proposal. The MARPOL amendment, entered into force by tacit acceptance procedure with the same deadline as the EU regulation. ②

Annex II deals with pollution by noxious liquid substances carried in bulk. Discharge criteria are established for different types of chemicals in different operating environments, and standards have been established for tank washing and associated pumping and piping arrangements. Initially some 250 substances were evaluated and included in the list appended to the Convention. The discharge of residues of those chemical substances is allowed only to reception facilities until certain concentrations and conditions (which vary with the category of substances) are complied with. In any case, no discharge of residues containing noxious substances is permitted within 12 miles of the nearest land.

Annex III is the first of the convention's optional annexes and deals with pollution by harmful substances carried in packages, portable tanks, freight containers, road or rail tank wagons, etc. It contains general requirements for the issuing of detailed standards on packing, marking, labelling, documenta-

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① COM (2000)142 final, 2.

② For details about EU's initiatives and response in the IMO, *see* Veronique Frank, Consequences of the Prestige sinking for European and international law, *International Journal of Marine and Coastal Law*, vol. 20, 2005, pp. 18-21. For more details about the phase-out single hull tankers in IMO, *see* Alan Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation*, Cambridge: Cambridge University Press, 2006, pp. 139-155.

tion, stowage, quantity limitations, exceptions and notifications for preventing pollution by harmful substances. "Harmful substances" covered by Annex III are those substances which are identified as marine pollutants in the IMO International Maritime Dangerous Goods Code (IMDG Code).

Annex IV contains requirements to control pollution of the sea by sewage. Annex V on pollution by garbage from ships, deals with different types of garbage and specifies the distances from land and the manner in which they may be disposed of. Perhaps the most important feature of the Annex is the complete ban imposed on the dumping into the sea of all forms of plastic.

A Protocol adopted at the Conference of the Parties in September 1997 introduced a new Annex VI, amending MARPOL 73/78. Annex VI entered into force on 19 May 2005 and deals with regulations for the prevention of air pollution from ships. March 2010 amendments to Annex VI were enforced on 1 August 2011. It formally established a North American Emission Control Area, in which emissions of sulphur oxides (SOx), nitrogen oxides (NOx) and particulate matter from ships are subject to more stringent controls than the limits that apply globally. ①

Annexes I, II, and V of MAPOL contain special mandatory requirements for certain areas (special areas) regarding the prevention of operational discharges of harmful substances. In general terms, the requirements for discharges in special areas are stricter than those outside them. ② A comparison between areas requiring special mandatory measures mentioned in Art. 211 (6) of UNCLOS and provisions on Special Areas under MARPOL indicates that, while the former are restricted in jurisdictional scope to the EEZ, the MARPOL Special Area provisions cover enclosed or semi-enclosed areas which may include parts of the territorial sea, the EEZ and the high seas. While MARPOL special requirements only apply to the discharge of harmful substances, Art. 211 (6) of UNCLOS does not contain any specification as to the kind of measures that may be taken.

Moreover, the Special Area is different from Particularly Sensitive Areas

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① *See* http://www.imo.org/About/Conventions/Pages/Action—Dates.aspx, 16 May 2011.

② JingJing Xu, The Public Law Framework of Ship-Source Oil Pollution, *Journal of International Maritime Law*, vol. 13, 2007, p. 423.

(PSSAs) *that are contained in the* IMO *Resolution* A. 927 (22)[①] and A. 982 (24)[②]. [③] PSSA is an area which needs special protection through action by the IMO because of its significance for recognized ecological, socio-economic or scientific reasons; it may be vulnerable to damage by international shipping activities. PSSA is like an "empty vessel" as it entails no inherent protective mechanisms,[④] but needs to be accompanied by specific Associated Protective Measures (APM). Currently, the most famous PSSA is the West European PSSA, which covers a vast area from the Shetland Islands north of Scotland to the southern Portuguese-Spanish border in the respective States' EEZ and territorial seas.

B. SOLAS

Chapter V of SOLAS requires ships to carry voyage data recorders (VDRs). The regulations entered into force on 1 July 2002 and all new ships built on or after that date have to be equipped with VDRs. Like the black boxes carried on aircraft, VDRs enable accident investigators to review procedures and instructions in the moments before an incident and to help identify the cause of any accident. Chapter V also makes it mandatory for certain ships to carry an automatic identification system (AIS).

In accordance with Art. 22(3)(a) of the LOSC, coastal states must, in the designation of sea lanes and the prescription of traffic separation schemes in territorial sea, "take into account", *inter alia*, "the recommendations of the competent international organization" (IMO). In the case of sea lanes, the relevant IMO's provisions are contained in SOLAS regulation V/8. Regulation V/8 establishes that ships' routeing systems "are recommended for use by, and may be made mandatory for, all ships, certain categories of ships or ships carrying certain cargoes, when adopted and implemented in accordance with the

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① IMO Assembly, Resolution A. 927(22) adopted on 29 November 2001. Guidelines for the designation of special areas under MARPOL 73/78 and guidelines for the identification and designation of particularly sensitive sea areas. A 22/Res. 927, 15 January 2002.

② Resolution A. 982(24) revokes annex 2 of resolution A. 927(22). IMO Assembly, Resolution A. 982(24) adopted on 1 December 2005. Revised guidelines for the identification and designation of particularly sensitive sea areas. A 24/Res. 982, 6 February 2006.

③ For details, *see* Nihan Unlu, Particularly Sensitive Sea Areas: Past, Present and Future, *WMU Journal of Maritime Affairs*, vol. 3, 2004, pp. 159-169.

④ Markus Detjen, The Western European PSSA-testing a unique international concept to protect imperiled marine ecosystems, *Marine Policy*, vol. 30, 2006, pp. 442-453.

guidelines and criteria developed by the Organization"(IMO). paragraph (d) of regulation V/8 acknowledges that the initiation of establishing ships' routeing system is the responsibility of the Governments or Government concerned, which should take into account the guidelines and criteria developed by the IMO.

SOLAS regulation V/8-1 enables States to adopt and implement mandatory ship reporting in accordance with guidelines and criteria developed by the IMO. The regulation makes it mandatory for ships entering areas covered by ship reporting systems to report in to the coastal authorities giving details of sailing plans. Other information may be also required in case of certain categories of ships and ships carrying certain cargoes. SOLAS regulation V/8-2 deals with vessel traffic services and provides that the use of a VTS may only be made mandatory in sea areas within the territorial sea of a coastal State.

Ships carrying dangerous cargo are subject to chapter Ⅶ of SOLAS, which regulates safety measures, including their safe packaging and stowage, applicable to the carriage of dangerous goods by sea. This chapter is supplemented by several IMO codes, namely: the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code), the International Code for the Construction and Equipment of Ships Carrying Liquified Gases in Bulk (IGC Code) (regulation Ⅶ/13), the International Maritime Dangerous Goods Code (IMDG Code), and the Code for the Safe Carriage of Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes in Flasks on Board Ships (INF Code).

C. Anti-Fouling Convention

Anti-fouling paints are used to coat the bottoms of ships to prevent sea life such as algae and molluscs attaching themselves to the hull-thereby slowing down the ship and increasing fuel consumption. In the early days of sailing ships, lime and later arsenic were used to coat ships' hulls, until the modern chemicals industry developed effective anti-fouling paints using metallic compounds. These compounds slowly "leach" into the seawater, killing barnacles and other marine life that have attached to the ship. But studies have shown that these compounds persist in the water, killing sea life, harming the environment and possibly entering the food chain. One of the most effective anti-fouling paints, developed in the 1960s, contains the organotin tributylin (TBT), which has been proven to cause deformations in oysters and sex changes in

whelks.

The harmful environmental effects of organotin compounds were recognized by the IMO in 1989. In 1990 IMO's Marine Environment Protection Committee (MEPC) adopted a resolution which recommended that Governments adopt measures to eliminate the use of anti-fouling paint containing TBT on non-aluminium hulled vessels of less than 25 metres in length and eliminate the use of anti-fouling paints with a leaching rate of more than four microgram's of TBT per day. In November 1999, the IMO adopted an Assembly resolution that called on the MEPC to develop an instrument, legally binding throughout the world, to address the harmful effects of anti-fouling systems used on ships. The resolution called for a global prohibition on the application of organotin compounds which act as biocides in anti-fouling systems on ships by 1 January 2003, and a complete prohibition by 1 January 2008.

The new Convention adopted on 5 October 2001 (entry into force 17 Sept 2008) defines "anti-fouling systems" as "a coating, paint, surface treatment, surface or device that is used on a ship to control or prevent attachment of unwanted organisms." Under the terms of the new Convention, Parties to the Convention are required to prohibit and/or restrict the use of harmful anti-fouling systems on ships flying their flag, as well as ships not entitled to fly their flag but which operate under their authority and all ships that enter a port, shipyard or offshore terminal of a Party. Ships of above 400 gross tonnage and above engaged in international voyages (excluding fixed or floating platforms, FSUs and FPSOs) are required to undergo an initial survey before the ship is put into service or before the International Anti-fouling System Certificate is issued for the first time; and a survey when the anti-fouling systems are changed or replaced. Ships of 24 metres or more in length but less than 400 gross tonnage engaged in international voyages (excluding fixed or floating platforms, floating storage units (FSUs) and Floating Production Storage and Offtake units (FPSOs) have to carry a Declaration on Anti-fouling Systems signed by the owner or authorized agent. The Declaration will have to be accompanied by appropriate documentation such as a paint receipt or contractor Invoice.

Anti-fouling systems to be prohibited or controlled will be listed in an annex (Annex I) to the Convention, which will be updated as and when necessary. Annex I attached to the Convention states that by an effective date of 1 January 2003, all ships shall not apply or re-apply organotin compounds which act as biocides in anti-fouling systems. By 1 January 2008 (effective date),

ships either: (a) shall not bear such compounds on their hulls or external parts or surfaces; or (b) shall bear a coating that forms a barrier to such compounds leaching from the underlying non-compliant anti-fouling systems. This applies to all ships, including fixed and floating platforms, FSUs, and FPSOs. The Convention includes a clause in Article 13 stating that a ship shall be entitled to compensation if it is unduly detained or delayed while undergoing inspection for possible violations of the Convention. The Convention provides for the establishment of a "technical group" of experts to review proposals for other substances used in anti-fouling systems to be prohibited or restricted. Article 6 on the Process of Proposing Amendments to controls of Anti-fouling systems sets out the evaluation method of an anti-fouling system.

D. BWM Convention

One of the earliest references to marine alien species in an international instrument can be found in Article 196(1) of the LOSC. [①] It provides that States shall take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction and control, or from intentional or accidental introduction of species, alien or new, to a particular part of the marine environment, which may cause significant and harmful changes thereto.

However, since 1982 the evolution of global comprehension of the relationship between human activities and environment, and the concept of sustainable development has taken the next step to an even more holistic or integral approach based on an ecosystemic view. [②] The 1992 Convention on Biological Diversity (CBD) was adopted and widely accepted by States. [③] According to the Article 8(h), each Contracting Party shall, as far as possible and as appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.

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① Karen Scott, Defending the World below the Brine, Managing Invasive Species under the 2004 Ballast Water Convention — A New Zealand Perspective, *Journal of International Maritime Law*, vol. 14, 2008, p. 309.

② Moira L. McConnell, Ballast and Biosecurity: The Legal, Economic and Safety Implications of the Developing International Regime to Prevent the Spread of Harmful Aquatic Organisms and Pathogens in Ships' Ballast Water, *Ocean Yearbook*, vol. 17, 2003, p. 238.

③ Until now, there are 193 parties of the CBD, *See* http://www.cbd.int/convention/parties/list/, 20 May 2011.

The IMO first adopted the 1973 International Convention for the Prevention of Pollution from Ships. It was amended by the 1978 Protocol (MARPOL) in order to achieve the complete elimination of intentional pollution of the marine environment by oil and other harmful substances and the minimization of accidental discharge of such substances. ① Three aspects of MARPOL are of particular relevance to the BWM Convention through the establishment of special control in certain areas, certification and inspection regimes, and the provision of reception facilities. ② Then, the IMO published the non-binding Guidelines for Preventing the Introduction of Unwanted Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges, Resolution A. 774 (18) as interim solution in 1993; it was as revised by Resolution A. 868 (20) in 1997. The guidelines were an important development because they set forth internationally agreed management practices and called for uniform action by states. However, they rely heavily on the mid-ocean exchange of waters taken up from coastal waters in the vicinity of the port of origin for oceanic waters; and provide little incentive for treatment innovation. ③ Finally, the BWM Convention was adopted in 2004, which specifically focuses on invasive species from ballast water.

The BWM Convention will enter into force 12 months after the ratification of 30 states representing at least 35 per cent of gross tonnage of the world's merchant shipping. ④ Until 31 August 2011, 28 countries already ratified the convention, including some EU Member States (Sweden, Netherlands, France and Spain), shipping powers (Norway and South Korea), small islands countries (Maldives, Cook Islands, Marshall Islands and Tuvalu), developing countries (Mexico, Brazil, Egypt, Kenya, South Africa and etc), and Canada. Eleven countries ratified the BWM Convention during the period Sept 2009 — Sept 2010, which shows an emerging acceptance of the BWM Convention within international community. The BWM Convention established a two-tier process for ballast water management, including standards set by the Convention and more stringent rules from coastal States. The BWM Convention, together with

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① Para. 5, Preamble, MARPOL73/78.

② Maria Helena Fonseca De Souza Rolim, *The International Law on Ballast Water. Preventing Biopollution*, Leiden: Martinus Nijhoff Publishers, 2008, p. 54.

③ Jeremy Firestone and James J. Corbett, Coastal and Port Environments: International Legal and Policy Responses to Reduce Ballast Water Introductions of Potentially Invasive Species, *Ocean Development and International Law*, vol. 36, 2005, p. 294.

④ Article 18(1), BWM Convention.

its Annex and supplementary guidelines, identifies four discrete elements integral to ballast water management: planning and record keeping; management of sediment uptake and discharge; management of ballast water uptake and discharge; and special area requirements. It also sets forth additional obligations related to notification and the provision of information, research and development, cooperation, enforcement and compliance. [①] Furthermore, as recommended by the World Health Organization (WHO), the BWM Convention cross-references with Guide to Ship Sanitation and International Health Regulations, since there is a potential public health risk associated with the presence of pathogens in ballast water. [②]

Ⅵ. Challenges for International Legal Regime

There is no doubt that a comprehensive international legal regime has been established for the prevention of vessel-source pollution during the past decades. However, great challenges still exist.

The need to enhance effective implementation and enforcement of international legal regime continues to be a challenge for the international community. Although lack of capacity and technical knowledge contributes to this issue, insufficient political will and lack of long-term integrated planning also plays a role. [③] The IMO is sometimes called "toothless tiger," since it has very limited powers to directly enforce international measures adopted under its ae-

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① *See* Resolution A. 982(24) revokes annex 2 of resolution A. 927(22). IMO Assembly, Resolution A. 982(24) adopted on 1 December 2005. Revised guidelines for the identification and designation of particularly sensitive sea areas. A 24/Res. 982, 6 February 2006, 312.

② For details, *see* Moira L. McConnell, Ballast and Biosecurity: The Legal, Economic and Safety Implications of the Developing International Regime to Prevent the Spread of Harmful Aquatic Organisms and Pathogens in Ships' Ballast Water, *Ocean Yearbook*, vol. 17, 2003, pp. 48-51.

③ Unedited reporting material on the topic of focus at the twelfth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea, entitled: "Contributing to the assessment, in the context of the United Nations Conference on Sustainable Development, of progress to date and the remaining gaps in the implementation of the outcomes of the major summits on sustainable development and addressing new and emerging challenges." A/66/70/Add. 1.

gis. [1] It is up to the domestic legal system to decide the position and the effect of an international norm within its territory. [2] Nevertheless, two major problems are addressed in relation to the effectiveness of international law. First, the states are expected to implement and comply with the stipulations of international conventions with little consideration for their capacity to do so. Second, the current international legal framework is state-centric, that is focusing on the efforts of states to control international oil pollution. [3] Progress has so far been slow and existing procedure still appear to be inadequate to bring about full compliance, which ultimately depends on the State parties. [4]

The absolute primacy of freedom of navigation is under challenge. Undoubtedly, freedom of navigation is enshrined in the LOSC. As mentioned above, the LOSC intends to establish a delicate balance between the freedom of navigation and coastal state jurisdiction. Nevertheless, it is believed that the concept of flag state jurisdiction cannot adequately address contemporary maritime concerns, including those related to marine environmental protection. [5] As pointed out by Alan Tan, the fundamental weakness of flag state jurisdiction is the fact that most flag states-whose vessels rarely venture into their own waters-have never had the incentive to regulate the activities of these vessels which cause harm to or affect the interests of other states. [6] It is believed that the current regime weighs too heavily in favor of the freedom of navigation. Coastal states lack the ability to impose or enforce effective antipollution meas-

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① E. g. In order to improve implementation and enforcement by flag States, the IMO approved the Voluntary IMO Member States Audit Scheme to provide a comprehensive and objective assessment of how effectively flag States administer and implement the mandatory IMO instruments covered by the Audit Scheme. In 2009, the IMO Assembly endorsed the decision of the IMO Council and agreed to make the Audit Scheme an institutionalized, mandatory scheme, which will only be phased in through the introduction of amendments to IMO instruments in 2013, for entry into force in Jan 2015. *See*. A/65/69/Add. 2, Paras. 73-74.

② Armin von Bogdandy, Pluralism, Direct Effect, and the Ultimate Say: on the Relationship. between International and Domestic Constitutional Law, *International Journal of Constitutional Law*, vol. 6, 2008, p. 397.

③ Emeka Duruigbo, Reforming the International Law and Policy on Marine Oil Pollution, *Journal of Maritime Law and Commerce*, vol. 31, 2000, pp. 81-85.

④ Veronique Frank, *The European Community and Marine Environmental Protection in the International Law of the Sea*, *Implementing Global Obligations at the Regional Level*, Leiden: Martinus Nijhoff Publishers, 2007, p. 40.

⑤ *See* Alan Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation*, Cambridge: Cambridge University Press, 2006, p. 18.

⑥ *See* Alan Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation*, Cambridge: Cambridge University Press, 2006, p. 18.

ures before catastrophic accidents occur, even in EEZ areas with special ecological significance. ① Accompanied with more concerns of marine environment, nowadays a creeping jurisdiction of costal states can be noticed in practice. This sometimes results in tension between regional/national law and international law. A typical case is the "Intertanko case (Case C308/06)" within the European Court of Justice in 2008. The shipping industry challenged the legality of European Union Directive 2005/35/EC on ship-source pollution and on the introduction of penalties, particularly criminal penalties, for infringements. It is believed by the shipping industry that the Directive 2005/35/EC is in violation of the LOSC and the MARPOL and may cause heavier burden for shipping industry in European waters. ②

Prevention of vessel-source pollution in areas beyond national jurisdiction is another issue which needs to be addressed. Under the current international legal regime, it is basically flag State's responsibility to prevent vessel-source pollution in the high sea. Coastal State plays a very limited role to protect marine environment in sea areas beyond their jurisdiction. Therefore, the marine environment in the high sea is becoming a "common tragedy." ③ How to effectively deal with vessel-source pollution in high sea? This is a question waiting for international and regional response.

Finally, green house gas emission from shipping is also a type of vessel-source pollution, which greatly contributes to global warming/climate change. The Second IMO Greenhouse Gas (GHG) Study 2009 estimates that 1,046 million tons of CO2 were emitted from shipping in 2007. This corresponds to 3.3 percent of the global emissions that year. International shipping is estimated to have emitted 870 million tons, or about 2.7 percent of the global emissions of CO2 in 2007. In the absence of measures to control emissions from ships emissions may grow from 150 percent to 250 percent of 2007 emissions by 2050 as a result of the growth in shipping. ④ Despite great efforts made by the IMO in recent years, there is still no binding international legal instrument dealing with reduction of GHG emission from shipping. The main question is

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① Chelsea Purvis, Coastal State Jurisdiction under UNCLOS: the Shen Neng 1 Grounding on the Great Barrier Reef, *Yale Journal of International Law*, vol. 36, 2011, p. 208.

② Case C308/06, at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:62006J0308:EN:HTML, 29 May 2011.

③ Garret Hardin, The Tragedy of the Commons, *Science*, vol. 162, 1968, pp. 1243-1248.

④ Second IMO GHG Study 2009, Update of the 2000 IMO GHG Study, Executive Summary, MEPC 59/4/7, 9 April 2009.

how to apply the principle of "common but differentiated responsibility (CBDR)" to the shipping industry. ① A proposal to include shipping emissions in the Copenhagen climate agreement was blocked by China, India, Saudi Arabia and Bahamas during the Copenhagen Climate Change Conference in 2009. ② China's position is that the IMO should only consider technical issues, and leave political, legal, and economic matters to be decided by the Conference of Parties of the United Nations Framework Convention on Climate Change (UNFCCC). ③ Moreover, China insists that the CBDR principle should be the key principle in the negotiation process within the IMO. ④

Ⅶ. Conclusions

During the past decades, the international community has been making great effort to establish a comprehensive international legal regime for the prevention of vessel-source pollution. The LOSC is an "umbrella convention," which delicately divides jurisdiction between flag, coastal and port States. The IMO Conventions (MARPOL, SOLAS, BWM Convention, Anti-Fouling Convention and etc) are more technical. The LOSC and IMO conventions interface with each other and have extensively addressed the issue of vessel-source pollution. However, the main problem of international law is the implementation and enforcement of international law by sovereign States/regional power. Moreover, a rethinking of the relation between freedom of navigation and coastal

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① Principle 7 of the Rio Declaration provides the first formulation of the CBDR, and it states: "In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command." For the application of CBDR in shipping industry, one of the major problems is that a huge number of ships operate under flags of convenience. In that case, ship. owners from developed countries can easily disguise their identity. *See* Saiful Karim and Shawkat Alam, Climate Change and Reduction of Emissions of Greenhouse Gases from Ships: An Appraisal, *Asian Journal of International Law*, vol. 1, 2011, pp. 131-148.

② *See* http://www.seas-at-risk.org/news_n2.php? page=273, 29 May 2011.

③ Para. 5, Report of the Marine Environment Protection Committee on its 59th Session, statement by the Delegation of China on GHG Issues, MEPC 59/24Add. I (2009), Annex 13.

④ Report of the Marine Environment Protection Committee on its 60th Session, MEPC 60/22 (2010), Annex 4.

State jurisdiction is gaining much more support. Finally, serious issues such as prevention of vessel-source pollution in the high seas and reduction of GHG emission from shipping are not fully addressed by the international law.

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