

Flag State Jurisdiction of The Maldives: Protection and Preservation of the Marine Environment from Vessel Source Pollution

Ahmed Adham Abdulla¹

Abstract

The Maldivian archipelago is located in an area with an immensely high risk of vessel source pollution. Due to the low-lying, scattered island temperament and lack of clean-up technology and resources, if a maritime casualty were to occur in and around the Maldives, the country may not survive, at least socio-economically. Under the *international legal framework*, flag States have a legal responsibility to ensure that their vessels comply with international law, wherever the vessels are located. This article identifies and analyses the gaps between the international legal framework and the national legal framework for the protection and preservation of the marine environment from vessel source pollution, applicable to the flag States of Maldives.

Keywords: Flag State Jurisdiction, Protection of Marine Environment, Maldives.

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¹Correspondence concerning this article should be addressed to Ahmed Adham Abdulla, Human Rights Commission of the Maldives, Male', Maldives. Email: Ahmed.adham@hrcm.org.mv

1 INTRODUCTION

The protection and preservation of the marine environment from vessel source pollution is an important ecological issue that has captured world attention in the past five decades or so and is prominently addressed in international political fora.² In protecting and preserving the marine environment, almost universally, environmental remedies have been applied after some actual disaster, particularly pollution from oil spills, with early warnings generally being ignored.³

The human cost of vessel source pollution is staggering. It was estimated in 2018 that pollution from vessels causes approximately four hundred thousand premature deaths from lung cancer and cardiovascular disease, and fourteen million cases of childhood asthma each year worldwide.⁴ Vessel source pollution consists, among other things, of pollutant discharge such as oil, noxious liquid substances in bulk, harmful substances carried in packaged form, sewage, garbage, greenhouse gases and ballast water discharged from vessels.⁵

Oil is the pollutant with the longest history of international attention. While many sources of pollution are toxic to the marine environment, there is no substance more damaging than oil, especially if a large amount of oil is spilt

2 Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge University Press, 2006).; Vessel source pollution despite the location of the incident has substantial legal consequences. See Changwoo Ha (2020) Criminal jurisdiction for ship collision and marine pollution in high seas-Focused on the 2015 judgement on M/V Ernest Hemingway case, *Journal of International Maritime Safety, Environmental Affairs, and Shipping*, 4:1, page 13.

3 Bin Lin and Cheng-Yuan Lin, 'Compliance with international emission regulations: Reducing the air pollution from merchant vessels' (2006) 30 *Marine Policy* 220 at 221; See also Kari Hakapaa, Erik Franckx and Erik Jaap Molenaar, 'Final Report of Committee on Coastal State Jurisdiction Relating to Marine Pollution' (Paper presented at the International Law Association Conference, London, 25 July 2000) at 5. Hakapaa, Franckx and Molenaar argued that the 'Law of the sea is an area of law which develops to a large extent in response to concrete casualties'.

4 James J. Winebrake and James J. Corvett (2018), *The Urgency of Curbing Pollution from Ships, Explained*, *The Conversation*, <http://theconversation.com/the-urgency-of-curbing-pollution-from-ships-explained-94797>, accessed on 17 March 2020.

5 William and Mackenzie have stated that pollutants from vessels include metals, nutrients, radio-nuclides oil, synthetic organic compounds, plastics, sediments, carbon dioxide and other radioactive gases, as well as a great diversity of municipal and industrial wastes. See H. H. Williams and K. MacKenzie, 'Marine Parasites as Pollution Indicators: an update' (2003) 126 *Cambridge Journals* 28; Furthermore, vessel source pollution can result from engine and machinery noise, causing physical damage to marine organisms. J. P Roberts, *Marine Environment Protection and Biodiversity Conservation: The Application and Future Development of the IMO's Particularly Sensitive Sea Area Concept* (PhD Thesis, University of Wollongong 2006) page 69.

in restricted coastline.⁶ Maritime casualties such as the *Amoco Cadiz*,⁷ *Exxon Valdez*,⁸ *Erika*,⁹ *Torrey Canyon*¹⁰ and the *Prestige*¹¹ are famous vessel source pollution incidents that caused substantial damage to the marine environment of various countries.¹² Such incidents have attracted high profile media coverage and a great deal of public scrutiny, compelling government regulators, law enforcement agencies and shipping companies to instigate remedial action in order to minimise damage to coastlines and promote good environmental

6 M White, *Australasian Marine Pollution Laws* (The Federation Press, 2nd ed 2007).

7 The *Amoco Cadiz* was a VLCC (Very Large Crude Carrier) tanker proceeding north off the coast of France in heavy weather when its steering failed. Despite salvage efforts, the tanker eventually broke apart and sank. Nearly all of its cargo was released, some 230,000 tonnes of crude oil, which mainly washed ashore on the French Atlantic coast. M White, *Australasian Marine Pollution Laws* (The Federation Press, 2nd ed 2007).

8 In March 1989 the VLCC *Exxon Valdez* ran aground when sailing fully laden from the oil terminal at Prince William Sound, Alaska. It was a pristine marine wilderness area and the tanker spilled some 40,000 tons (11 million gallons) of crude oil, which then spread around the sea and shores. M White, *Australasian Marine Pollution Laws* (The Federation Press, 2nd ed 2007); Roger C. Melm, R. Glenn Ford and Harry R. Carter, 'The Oil Pollution Act of 1990 and Natural Resource Damage Assessment' (2006) 34 *Marine Ornithology* 99; Michael G. Chalos, 'Should I Go Down With The Ship, Or Should I Rot In Jail – A Modern Master's Dilemma' (2003) 132 *Maritime Studies* 1; W. K. Talley, D. Jin and H. Kite-Powell, 'Post OPA-90 vessel oil spill differentials: transfers versus vessel accidents' (2004) 31(3) *Maritime Policy and Management* 225.

9 In December 1999 the Maltese-registered tanker *Erika* was proceeding north in the Bay of Biscay when it encountered heavy weather and broke in two and sank some 60 nautical miles off the coast of France. About 19,800 tonnes of oil were spilled. Even more oil leaked out later as the bow and the stern sections sank separately. Most of the oil was spread along some 400 kilometres off the French Atlantic coast due to stormy weather. The spill impacted fisheries, maritime and other commercial activities. A.B. Alexopoulos and G. Dounias, 'An Assessment of Vessel-Source Oil Pollution Incidents in the Mediterranean Sea using Inductive Machine Learning Methodology' (Aegean Working Papers Issue 1, 2003) <www.stt.aegean.gr/docs/awp/issue1/ABS1_0101.pdf> at 22 March 2020, page 3; Aldo Chircop, 'Ships in Distress, Environmental Threats to Coastal States, and Places of Refuge: New Directions for an Ancient Regime?' (2002) 33 *Ocean Development & International Law* 207.

10 The *Torrey Canyon* incident involved many States. While originally built in the United States in 1959, the tanker was 'Jumboised' in Japan in 1964. It was registered in Monrovia and flew the Liberian flag, although it had never been to Liberia. It was owned by the Barracuda Tanker Company that maintained 'filing cabinet' offices in Hamilton, Bermuda, and in Monrovia. The officer and crew were Italian. On its fateful voyage, the tanker had been chartered by British Petroleum, laden with over 100,000 tons of Kuwait crude oil and bound for their refinery at Milford Haven, Wales. *Torrey Canyon* was considered to be very well equipped and manned. Sonia Zaide Pritchard, *Oil Pollution Control* (Croom Helm, 1987).

11 In November 2002 the Bahamas-registered tanker *Prestige* was proceeding north off the coast of Spain (and Portugal) when it began leaking oil cargo. Salvage operations were commenced and the salvos sought permission to shelter the vessel in Spanish waters, which was refused. The salvos were required to tow the vessel well offshore but, in the end, the *Prestige* broke in two and sank in the Atlantic Ocean, releasing some 25,000 tonnes of cargo. The two sections sank in very deep water and slowly leaked more oil which then spread over the Spanish and French coast. M White, *Australasian Marine Pollution Laws* (The Federation Press, 2nd ed 2007).

12 See generally *ibid*.

practices.¹³

Large scale vessel source pollution incidents not only place a huge financial burden on the local population, but also threaten concerned parties. Low-lying archipelagic States, such as the Maldives, are particularly vulnerable to such pollution incidents due to their high reliance on the marine environment for socio-economic sustenance. For this reason, each pollution accident is seen emotively as ‘one incident too many’.¹⁴

The environmental consciousness that oceans are no longer an inexhaustible resource, and that the quality of the marine environment is deteriorating quite rapidly, has resulted in a very complex system of integrated oceans policies and the development of international legal rules for the protection and preservation of the marine environment from vessel source pollution.¹⁵ This system is designed to reconcile the divergent interests of various actors such as flag, coastal and port States, shipping companies and public environmental interests.¹⁶

The frequent occurrences of vessel source pollution have raised the question as to why these incidents continue to occur, despite the existence of numerous international rules and standards relating to the protection and preservation of the marine environment. The general consensus is that there are sufficient international regulations to provide an effective framework for the protection of the marine environment from vessel source pollution, but that these

13 Lachlan M. Payne, ‘Managing the Impact of Shipping on the Marine Environment’ in Hawksley C.M and Ran C.B (eds), *Preservation and Protection of the Marine Environment* (University of Wollongong, 2000), page 102.

14 Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge University Press, 2006); Protection and preservation of the marine environment is worth every effort as the marine environment is the world’s most vulnerable ecosystem. Deepa Badrinarayana, ‘International Marine Environmental Law, Institutions, Implementation and Innovations’ in Andree Kirchner (ed), *International Environmental Law and Policy Series* (Kluwer Law International, 2003) page 363.

15 Integrated oceans policy and management has become widely accepted around the world. Gregory L. Rose, ‘Legal Frameworks for Integrated Marine Environment Management’ (University of Wollongong, 2006) at 3; Erik Franckx, *Vessel-Source Pollution and Coastal State Jurisdiction: The Work of the ILA Committee on Coastal State Jurisdiction Relating to Marine Pollution 1991 - 2000* (Kluwer Law International, 2001).

16 Tan has argued that the most probable solution to vessel source marine pollution is to create incentive-enhancing measures that foster more accountability and transparency among various actors. See generally Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge University Press, 2006).

regulations lack national prescription and enforcement by States.¹⁷ In fact, the effectiveness of these international legal instruments depends on their implementation through national enabling legislation,¹⁸ their enforcement by States, coupled with a sense of environmental stewardship among various ocean users.¹⁹

Vessels must be registered with a State that can exercise jurisdiction as prescribed by the United Nations Convention on the Law of the Sea 1982 (the LOS Convention)²⁰ over them, not only in the State's own seas, but also in the seas of other States.²¹ This is referred to as flag State jurisdiction.²² Flag State jurisdiction is, in most circumstances, exclusive²³ on the high seas and accorded

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- 17 Kai W. Wirtz and Xin Liu, 'Total oil spill costs and compensations' (2006) 33(1) *Maritime Policy and Management* 49 at 57; Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge University Press, 2006); Goodman has argued that while the topic of State jurisdiction is still the subject of significant discussion, the principal focus is now on enforcing the existing international rules, rather than developing significant new areas of State requirements. Camille Goodman, 'The Regime for Flag State Responsibility in International Fisheries law- Effective Fact, Creative Fiction, or Further Work Required?' (2009) 23 *Australian and New Zealand Maritime Law Journal* 157. *Creative Fiction, or Further Work Required?* (2009) 23 *Australian and New Zealand Maritime Law Journal* 157. *Articles/Books/Reports* at 157; According to Brinie, environmental disasters occur because ratifying States do not always strictly enforce international conventions on their vessels. Patricia Brinie, 'Enforcement of the International Laws for Prevention of Oil Pollution from Vessels' in Douglas J. Cusine and John P. Grant (eds), *The Impact of Marine Pollution* (Croom Helm London, 1980) page 95.
- 18 Sefanaia Nawarda, *Addressing Shipping Related Marine Pollution in the Pacific Islands Region* (2004) South Pacific Regional Environment Programme (SPREP) <www.sprep.org> at 23 January 2020 at 13.
- 19 A sense of environmental stewardship among ocean users is essential for laws to be effective. Seba B. Sheavly, 'Marine Debris- an Overview of a Critical Issue for Our Oceans' (Paper presented at the Sixth Meeting of the UN Open-ended Informal Consultative Process of Oceans and the Law of the Sea, New York, June 6-10, 2005).
- 20 United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982, In force 16 November 1994, 21 ILM 1245 (1982); The Maldives ratified the LOS Convention on 7 September 2006.
- 21 Arts & Humanities Research Council, *Satellite Monitoring as a Legal Compliance Tool in the Environment Sector. Case Study Five: Oil Pollution in Marine Waters* (AHRC Report 21) <http://www.ucl.ac.uk/laws/environment/satellites/docs/21_Oil_Pollution.pdf> at 24 January 2020, page 10; J. N. K. Mansell, *An Analysis of Flag State Responsibility from an Historical Perspective: delegation or derogation?* (PhD Thesis, University of Wollongong 2007) page 27. Mansell references Blay S et al (eds) *Public International Law: An Australian Perspective* (Oxford University Press, 2005) pages 157-168.
- 22 A. N. Wright, 'Beyond the Sea and Spector: Reconciling Port and Flag State Control over Cruise Ship onboard Environmental Procedures and Policies' (2007) 18 *Duke Environmental Law and Policy Forum* 215 at 221.
- 23 The Permanent Court of International Justice affirmed the exclusivity of flag State jurisdiction in the Lotus Case. See Angelos M. Syrigos, 'Developments on the Interdiction of vessels on the High Sea' in A. Strati, M. Gavouneli and N. Skourtos (eds), *Unresolved Issues and New Challenges to the Law of*

primary status over other types of jurisdiction²⁴ (i.e. coastal and port State jurisdiction). A flag State is obliged to exercise jurisdiction under its internal law over a vessel flying its flag.²⁵

This article critically analyses flag State jurisdiction as stipulated in the LOS Convention and the International Convention on the Prevention of Pollution from Ships (MARPOL 73/78).²⁶ The analysis of flag State jurisdiction is based on obligations of States to ensure that vessels registered to fly their flag comply with applicable international laws for the protection and preservation of the marine environment from vessel source pollution.

2 FLAG STATE PRESCRIPTIVE JURISDICTION OVER THE PREVENTION OF VESSEL SOURCE POLLUTION

The flag State jurisdiction system has been developed from the concept that vessels were considered a part of the State's territory and that there exists a factual link between the ship and the State in which it is registered, even if

the Sea (Martinus Nijhoff Publishers, 2006) ; Sefanaia Nawarda, Addressing Shipping Related Marine Pollution in the Pacific Islands Region (2004) South Pacific Regional Environment Programme (SPREP) <www.sprep.org> at 23 January 2020 at 6; There are several exceptions by which other States are granted a varying degree of legislative or enforcement jurisdiction with the flag State. See Bernaerts' Guide To The 1982 United Nations Convention On The Law Of The Sea, International Jurisdiction <<http://www.bernaerts-sealaw.com/JURISDICTION,%20HOT%20PURSUIT.doc>> at 24 March 2020; and David Anderson, 'The Roles of Flag States, Port States, Coastal States and International Organisations in the Enforcement of International Rules and Standards Governing the Safety of Navigation and the Prevention of Pollution from Ships Under the UN Convention of the Law of the Sea and other International Agreements' (1998) 2 Singapore Journal of International & Comparative Law 557 at 563; Haijiang Yang, Jurisdiction of the Coastal State over Foreign Merchant Ships in Internal Waters and the Territorial Sea (Springer, 2006); The concept of exclusivity of flag State jurisdiction is similar for vessels engaged in international trade and fishing. For a fisheries perspective, see generally FAO Corporate Document Repository, Flag State Responsibilities <<http://www.fao.org/DOCREP/005/Y3536E/y3536e07.htm#bm07.1>> at 23 January 2020.

24 David Anderson, 'The Roles of Flag States, Port States, Coastal States and International Organisations in the Enforcement of International Rules and Standards Governing the Safety of Navigation and the Prevention of Pollution from Ships Under the UN Convention of the Law of the Sea and other International Agreements' (1998) 2 Singapore Journal of International & Comparative Law 557 at 563; Erik Franckx, Vessel-Source Pollution and Coastal State Jurisdiction: The Work of the ILA Committee on Coastal State Jurisdiction Relating to Marine Pollution 1991- 2000 (Kluwer Law International, 2001).

25 Article 94(2)(b) of the LOS Convention.

26 International Convention for the Prevention of Pollution from Ships, London, 2 November 1973, as amended by the Protocol, London 1 June 1978, 1340 UNTS 61. The Maldives acceded to MARPOL 73/78 on 20 May 2005.

the ship is navigating the high seas.²⁷ There are exceptions to exclusive flag State jurisdiction, in which other States share jurisdiction with the flag States including piracy,²⁸ unauthorised broadcasting,²⁹ slave trading,³⁰ stateless vessels and vessels of uncertain nationality,³¹ hot pursuit,³² major pollution incidents,³³ exceptional measures and rights under special treaties.³⁴ For many area of the law of the sea, which are not subject to a specific exception to flag State jurisdiction, the exercise of flag State jurisdiction has been plagued by shortcoming. Enforcement gaps and adherence to the principle has frequently undermined the legal regime, e.g. in the areas of maritime safety and the marine environment.³⁵

Many sectors, in response to inadequate flag state enforcement or control, have developed innovative legal initiatives to improve control over vessels by effectively circumventing the exclusivity of flag State jurisdiction- often by extending jurisdiction over such matters to third States.³⁶

2.1 Flag State Prescriptive Jurisdiction In The LOS Convention Over The Prevention Of Vessel Source Pollution

Broadly, the LOS Convention requires flag States to protect the marine

27 Hazmi Rusli, R. Dremliga and Wan I. Talaat (2016), Legal Framework on the Marine Environment Protection of Straits used for International Navigation: Has It Been Effective in the Straits of Malacca and Singapore?, *Marine Environmental Protection*, IX (1), Page 82.; The Busan District Court imposed a penalty of 2 million won for each defendant of the M/V Hemingway' s case on the basis of Article 127(2) and Article 22(1) of the Maritime Environment Management Act, considering that they did not meet the duty of professional caution causing the ship collision, spilling about 600 liters of fuel oil = (diesel oil) that have been loaded on Geunyang-ho which contaminated the nearby sea, escaping from the scene of ship collision on high seas. Changwoo Ha (2020) Criminal jurisdiction for ship collision and marine pollution in high seas-Focused on the 2015 judgement on M/V Ernest Hemingway case, *Journal of International Maritime Safety, Environmental Affairs, and Shipping*, 4:1 ,page 13.

28 Article 100 of the LOS Convention.

29 Article 109 of the LOS Convention.

30 Article 110 of the LOS Convention.

31 Article 110 of the LOS Convention.

32 Article 111 of the LOS Convention.

33 This is understood to be a right of customary international law. Zoe Scanlon (2018), Addressing the Pitfalls of Exclusive Flag State Jurisdiction: Improving the Legal Regime for the Protection of Submarine Cables, *Journal of Maritime Law & Commerce*, Vol. 48, No.23, July, pages 303.

34 Zoe Scanlon (2018), Addressing the Pitfalls of Exclusive Flag State Jurisdiction: Improving the Legal Regime for the Protection of Submarine Cables, *Journal of Maritime Law & Commerce*, Vol. 48, No.23, July, pages 303.

35 Ibid.

36 Ibid, pages 295 and 296.

environment from pollution in three main ways. The first is the explicit obligation to protect and preserve the marine environment. Flag States have a general duty not to pollute the marine environment and must not condone the actions of nations that do.³⁷ The second and most critical obligation is the fundamental commitment of flag States to prescribe laws, regulations and standards in order to achieve the first duty of protecting the marine environment.³⁸ The third obligation is to enforce, at the national level, international standards that have been agreed upon for protecting the marine environment.³⁹

The following section analyses the general obligation of flag States to protect the marine environment, as well as the prescriptive jurisdiction of flag States for the protection and preservation of the marine environment from vessel source pollution, as provided in the LOS Convention.⁴⁰ The jurisdiction to enforce laws and regulations made by flag States is analysed in Section Three of this article.

2.1.1 The General Obligation to Protect and Preserve the Marine Environment from Vessel Source Pollution

The LOS Convention explicitly requires State parties to design measures to minimise vessels polluting the marine environment. States are required to take measures aimed at preventing accidents and dealing with emergencies, ensuring the safety of operations at sea, as well as regulating the design, construction, equipment, operation and manning standards on vessels.⁴¹ These measures seek to prevent, reduce and control pollution of the marine environment from the “release of toxic, harmful or noxious substances, especially those which are persistent... from or through the atmosphere and dumping” to the fullest possible extent.⁴²

37 Article 194 of the LOS Convention; Christopher C. Joyner, ‘The international ocean regime at the new millennium: a survey of the contemporary legal order’ (2000) 43 *Ocean & Coastal Management* 163 at 192.

38 Article 211 of the LOS Convention.

39 Article 194 of the LOS Convention; Christopher C. Joyner, ‘The international ocean regime at the new millennium: a survey of the contemporary legal order’ (2000) 43 *Ocean & Coastal Management* 163 at 192.

40 Flag State jurisdiction under the LOS Convention is not limited to the protection and preservation of the marine environment. It also extends to registration requirements, conditions of registry, exploitation of living resources, exploitation of non-living resources and scientific research. Such issues are not analysed in this article as they do not have direct relevance to State jurisdiction over the protection and preservation of the marine environment from vessel source pollution.

41 Article 194(3)(b) of the LOS Convention.

42 Article 194(3)(a) of the LOS Convention.

The measures taken by States to minimise vessel source pollution must also prevent intentional and unintentional discharges to the sea.⁴³ Some authors argue that the LOS Convention prohibits the intentional discharge of pollutants that are produced due to the normal operation of vessels into the marine environment.⁴⁴ However, the LOS Convention does permit operational discharges from vessels, provided that such discharges do not result in pollution or cause deleterious harm to living resources and the marine environment. According to the LOS Convention, pollution of the marine environment only occurs when:

*the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries...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.*⁴⁵

Three issues are particularly evident from the above definition of ‘marine pollution’. First, the definition of marine pollution is action-oriented (it focuses on the “introduction” of certain substances or energy) as well as being effect-oriented (by requiring that such introduction result in “deleterious effects”).⁴⁶ Second, the definition of marine pollution is based on a ‘probability formula’, as in a broad sense, pollution not only exists when “deleterious effects” actually occur, but also when pollution is likely to eventuate.⁴⁷

43 Article 194(3)(b) of the LOS Convention.

44 See for example, Erik Jaap Molenaar, *Coastal State Jurisdiction Over Vessel-Source Pollution* (Kluwer Law International, 1998) page 53; Molenaar’s statement is in reference to Article 194 of the LOS Convention.

45 Article 1(4) of the LOS Convention; The use of general terms such as “harm”, “hazards”, “hindrance”, “impairment”, “reduction” and “amenities” in the definition allow for multiple interpretations. In this regard, see Erik Jaap Molenaar, *Coastal State Jurisdiction Over Vessel-Source Pollution* (Kluwer Law International, 1998) page 53; The inclusion of “energy” in Article 1(4) of the LOS Convention can be read as an indication that negotiators of the Third United Nations Conference on Law of the Sea were aware of the threat to the marine environment from light and noise energy, as well as vibrations from explosive devices. Meinhard Doelle, ‘Climate Change and the Use of the Dispute Settlement Regime of the Law of the Sea Convention’ (2006) 37 *Ocean Development & International Law* 319; The LOS Convention does not contain a definition of the word sea or the expression marine environment. Nor is a definition provided for the expression prevent, reduce and control pollution, which is used repeatedly in Part XII of the LOS Convention.

46 M White, *Australasian Marine Pollution Laws* (The Federation Press, 2nd ed 2007); Erik Jaap Molenaar, *Coastal State Jurisdiction Over Vessel-Source Pollution* (Kluwer Law International, 1998), page 16.

47 *Ibid.*

Third, despite this rather broad interpretation of marine pollution, in the context of the LOS Convention marine pollution can only result from human behaviour. Therefore, seepage from the seabed, for example, which results or is likely to result in deleterious effects as harm to living resources and marine life, hindrance to marine activities and impairment of the quality for sea water, cannot be considered marine pollution.⁴⁸

2.1.2 The Obligation of Flag States to Formulate National Laws for the Prevention of Vessel Source Pollution

The likelihood of flag States discharging their duties under international law is largely dependent on the existence of robust legislation, which mandates strict compliance by vessels.⁴⁹ The LOS Convention requires flag States to formulate national laws for the prevention of vessel source pollution in three articles. The first is the obligation in Article 211 of the LOS Convention for flag States to “adopt laws and regulations for the prevention, reduction and control of pollution of the marine environment from vessels flying their flag or of their registry”.⁵⁰ Article 211 of the LOS Convention is the primary provision that regulates pollution from vessels, as the prescriptive jurisdiction of flag States under the article applies to the regulation of all types of vessel source pollution, i.e. pollution from the discharge of oil, noxious liquid substances, packaged goods, garbage, sewage and emissions of harmful substances to the atmosphere. Furthermore, Article 211 of the LOS Convention vigorously encourages the proliferation of national laws and regulations, as the various paragraphs of the article reference the adoption of laws more than seven times.

Second and more specifically, the LOS Convention requires flag States to formulate national laws for the prevention of vessel source pollution from the emission of harmful substances through vessel exhausts into the atmosphere. In this regard, Article 212 of the LOS Convention provides that “States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from or through the atmosphere, applicable to the air space under their sovereignty.”⁵¹ Therefore, this requirement applies to the air space above the territorial sea and archipelagic waters of flag States, as well as their internal waters.

48 Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge University Press, 2006).

49 P Burgherr, ‘In-depth analysis of accidental oil spills from tankers in the context of global spill trends from all sources’ (2006) 140 *Journal of Hazardous Material* 245 at 245.

50 Article 211(2) of the LOS Convention.

51 Article 212 of the LOS Convention.

Third and most importantly, flag States are obliged under Article 217 of the LOS Convention to “adopt laws and regulations and take measures necessary to ensure compliance by vessels flying their flag or of their registry”.⁵² This provision is particularly important as it provides the jurisdiction for flag States to enforce laws and regulations in order to ensure compliance by vessels in accordance with laws and regulations adopted by the State. Flag State enforcement jurisdiction is analysed in Section Three of this article.

Similar phrases to “other measures necessary” are provided in various articles of the LOS Convention.⁵³ However no guidance is provided in the LOS Convention on the scope of these “other measures” or how they might be “necessary” for flag States to ensure compliance by vessels. Therefore, it is essential to analyse the meaning of the phrase “other measures necessary” in the context of the LOS Convention.

In general, States may adopt their own interpretation of the phrase “other measures necessary”, as long as they comply with the duties imposed by the LOS Convention.⁵⁴ Articles of the LOS Convention that contain similar phrases to “other measures necessary” are predominantly found in the section that provides flag State prescriptive jurisdiction, titled ‘International Rules and National Legislation to Prevent, Reduce and Control Pollution of the Marine Environment’.⁵⁵ Therefore, it can be argued that “other measures necessary” may include government policies, guidelines and rules on flagging of ships⁵⁶ and the fixing of conditions for the grant of its nationality⁵⁷ in order to ensure a ‘genuine link’ between the flag State and the vessels under its registry.⁵⁸ Such

52 Article 217(1) of the LOS Convention.

53 Articles 207(2), 208(2), 210(2) and 212(2) of the LOS Convention.

54 C. A. Harrington, ‘Heightened Security: The need to incorporate Articles 3Bis(1)(A) and 8Bis(5)(E) of the 2005 Draft SUA Protocol into Part VII of the United Nations Convention on the Law of the Sea’ (2007) 16(1) Pacific Rim Law and Policy Journal 107 at 115.

55 Section 5 of Part XII of the LOS Convention.

56 Under Article 91 of the LOS Convention, every flag State has the right to develop its own criteria for flagging vessels. Notwithstanding exceptional circumstance, a vessel may fly the flag of only one State throughout the course of its journey, and may not change its flag during a voyage or while in a port of call. Article 92(2) of the LOS Convention states that a ship flying more than one flag may be assimilated into a Stateless ship.

57 Article 91 of the LOS Convention.

58 A genuine link between the State and the vessel must be established under Article 91(1) of the LOS Convention; The LOS Convention does not precisely define the concept of a ‘genuine link’. Therefore the interpretation of ‘genuine link’ differs widely among States. C. A. Harrington, ‘Heightened Security: The need to incorporate Articles 3Bis(1)(A) and 8Bis(5)(E) of the 2005 Draft SUA Protocol into Part VII of the United Nations Convention on the Law of the Sea’ (2007) 16(1) Pacific Rim Law and Policy Journal 107 at 114.

policies and guidelines generally complement the laws adopted in accordance with the LOS Convention.

Other measures necessary to ensure compliance by vessels may include the development of criteria and procedures for payment of adequate compensation to individuals and organisations that have been affected by a pollution incident.⁵⁹ Other measures may also include the development of guidelines to ensure recourse is available to affected parties within the legal system of flag States in conjunction with a fund specifically designated to provide adequate and prompt compensation in respect to damage caused by pollution to the marine environment.⁶⁰

In order to provide up-to-date responses to emerging needs for the protection and preservation of the marine environment, laws, regulations, guidelines and procedures adopted by States are to be re-examined from time to time as necessary.⁶¹ Furthermore, States are required to cooperate in establishing appropriate scientific criteria for the formulation and elaboration of laws and regulations for the prevention, reduction and control of pollution of the marine environment,⁶² in order to encourage consistency in the national laws adopted by flag States.

The obligation of flag States to formulate national laws is not limited to the prevention of vessel source pollution. According to the LOS Convention, States must adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources,⁶³ seabed activities subject to State jurisdiction,⁶⁴ activities in the area,⁶⁵ as well as dumping,⁶⁶ taking into account the internationally agreed rules, standards and recommended practices.

2.2 The Obligation to Formulate National Laws Under MARPOL 73/78

59 Article 235(3) of the LOS Convention.

60 Article 235(2) of the LOS Convention.

61 Articles 207(4), 208(5), 209(1), 210(4) and 211(1) of the LOS Convention.

62 Article 201 of the LOS Convention; The need for international cooperation in eliminating the effects of pollution and preventing or minimising damage to the marine environment is also emphasised in Article 199 of the LOS Convention.

63 Article 207(1) of the LOS Convention.

64 Article 208(1) of the LOS Convention.

65 By installations, structures and other devices as the case may be. Article 209(2) of the LOS Convention.

66 Article 210(1) of the LOS Convention.

flag States have a legal responsibility to adopt national laws in order to ensure that vessels under their registry comply with generally accepted international rules and regulations provided in multilateral conventions, such as MARPOL 73/78.⁶⁷ Flag State jurisdiction over the prevention of vessel source pollution is provided in the main text of MARPOL 73/78 and its six annexes. The main text of MARPOL 73/78 provides two obligations for flag States in this areas: they are (i) to formulate national laws to give effect to MARPOL 73/78; and (ii) to exercise enforcement jurisdiction in order to levy legal and administrative sanctions on non-compliant vessels. This section will analyse the first obligation as it deals with the jurisdiction of States to prescribe national laws to give effect to MARPOL 73/78. The second obligation, which pertains to enforcement jurisdiction, will be analysed in Section Three of this article.

Under MARPOL 73/78, States must adopt national legislation to give force to the convention, thereby exercising jurisdiction for the protection and mitigation of vessel source pollution.⁶⁸ The national laws enacted by States must regulate various matters that fall within the scope of MARPOL 73/78.⁶⁹ In this regard, MARPOL 73/78 states that national laws shall:

*give effect to the provisions of [the convention] and those Annexes thereto by which they are bound, in order to prevent the pollution of the marine environment by the discharge of harmful substances or effluents containing such substances in contravention of the convention*⁷⁰

MARPOL 73/78 does not provide any guidance on the scope of national legislation required to implement the convention. Therefore, State practices differ substantially in relation to national laws adopted to give force to MARPOL 73/78 and the regulations provided in applicable annexes to the convention. Furthermore, MARPOL 73/78 does not prohibit States from prescribing laws and regulations over their own flagged vessels that exceed the standards

67 W. K. Talley, Regulatory Issues: The Role of International Maritime Institutions, Department of Economics, Old Dominion University, Norfolk, Virginia USA <<http://www.bpa.odu.edu/port/research/REGULATORYISSUES.doc>> at 27 January 2020.

68 Yann-Huei Song, 'The Potential Marine Pollution Threat from Oil and Gas Development Activities in the Disputed South China Sea/Spratly Area: A Role that Taiwan Can Play' (2008) 39 Ocean Development & International Law 150 at 164; The obligation of States to protect and preserve the environment is confined by the national rules and standards they adapt to conform with rules and standards established through competent international organisations or diplomatic conferences. D. Dzidzornu and M. Tsamenyi, 'Enhancing International Control of Vessel-Source Oil Pollution Under the Law of the Sea Convention, 1982: A Reassessment' (1991) University of Tasmania Law Review 270 at 281.

69 Article 11(1)(a) of MARPOL 73/78.

70 Article 1(1) of MARPOL 73/78.

prescribed in the convention. However, while higher standards can be applied to a State's national vessels, they cannot be enforced against foreign vessels unless the relevant standard has been raised at the international level, through the International Maritime Organization (IMO).⁷¹

2.2.1 The Obligation of States to Communicate National Laws and Relevant Information to the IMO under MARPOL 73/78

Several articles in MARPOL 73/78 set out the duties and responsibilities that States accept when ratifying the convention.⁷² One of these duties is to notify the IMO of the laws that have been enacted on the various matters within the scope of MARPOL 73/78.⁷³ The communication shall include, among other things, specimens of certificates⁷⁴ and lists of reception facilities (including their location),⁷⁵ as well as reports on the application of the convention⁷⁶ and annual statistical reports of penalties imposed for infringements of MARPOL 73/78 provisions.⁷⁷

Various authors have concluded that most of the contracting parties to MARPOL 73/78 are not complying with the obligation to communicate national laws and other relevant information to the IMO. This raises some doubts with respect to the implementation of MARPOL 73/78 requirements by States. There may be various reasons for the lack of compliance with the reporting requirements under MARPOL 73/78. For example, there may be no information to report to the IMO because no discharges have been detected, or no vessels flying the flag of State parties have been involved in discharges. In this situation, it might seem logical not to send any reports because no discharges have been

71 R Churchill and A.V. Lowe, *The Law of the Sea* (Manchester University Press, 3rd ed 1999) page 346; Christian Pisani, 'Fair at Sea: The Design of a Future Legal Instrument on Marine Bunker Fuels Emissions within the Climate Change Regime' (2002) 33 *Ocean Development & International Law* 57.; The competent international organisation that has the most substantial direct effect upon the law of the sea is the International Maritime Organization (IMO).

72 Gerard Peet, 'International Co-operation to Prevent Oil Spills at Sea: Not Quite the Success It Should Be' in Helge Ole Bergesen and Georg Parmann (eds), *Green Globe Yearbook of International Co-operation on Environment and Development* (Oxford University Press, 1994) page 46.

73 Article 11(a) of MARPOL 73/78.

74 Article 11(c) of MARPOL 73/78.

75 Article 11(d) of MARPOL 73/78.

76 Article 11(1)(e) of MARPOL 73/78.

77 Article 11(f) of MARPOL 73/78; Gerard Peet, 'International Co-operation to Prevent Oil Spills at Sea: Not Quite the Success It Should Be' in Helge Ole Bergesen and Georg Parmann (eds), *Green Globe Yearbook of International Co-operation on Environment and Development* (Oxford University Press, 1994) page 47.

detected.⁷⁸

However, in order for an assessment of the effectiveness of MARPOL 73/78 to be conducted, it is important that reports stating that no alleged discharges have been detected be submitted to the IMO. The second reason may possibly be that States have been active with respect to the implementation of MARPOL 73/78, but have not submitted any reports to the IMO.⁷⁹

2.3 The Implementation of Flag State Prescriptive Jurisdiction by The Maldives

Under *Presidential Decree* No.138/2009/35, the flag State of Maldives must formulate laws to regulate the use of natural resources and the navigation of vessels within the maritime zones of Maldives,⁸⁰ as well as to protect the marine environment of Maldives.⁸¹ Furthermore, the Maldives is to formulate laws and regulations that give effect to and facilitate the implementation of international conventions that the flag State has ratified or acceded to on behalf of the government of Maldives,⁸² as well as ensuring that policies and guidelines are adopted to enhance compliance by vessels with international obligations.⁸³ These laws, regulations, policies and guidelines are to be based on the best available data and scientific research.⁸⁴

In relation to the marine environment, Articles 2 and 3 of the *Environment Protection and Preservation Act* 1993 provide pertinent Executive agencies, including the flag State, with the jurisdiction to adopt and enforce guidelines and policies for the protection and preservation of the marine environment.⁸⁵ There is currently no legislation in the Maldives implementing flag State prescriptive jurisdiction for the protection and preservation of the marine environment from vessel source pollution. However, the *Draft Navigation Act* (when enacted) will provide the basis for the Maldives to meet its obligations

78 Ibid.

79 Ibid.

80 Article 37 of Presidential Decree No.138/2009/35.

81 Article 1 of Presidential Decree No.138/2009/35.

82 Article 44 of Presidential Decree No.138/2009/35; Article 44 of the Decree states: "The Department of Transport is responsible to participate in international maritime conventions on behalf of the Government of Maldives and develop subsequent laws, policies, regulations and guidelines for effective implementation of such conventions."

83 Article 15(b) of the Draft Environment Protection Act.

84 Article 37 of Presidential Decree No.138/2009/35.

85 Articles 2 and 3 of the Environment Protection and Preservation Act 1993.

under the LOS Convention and MARPOL 73/78. The *Draft Navigation Act* imposes a requirement on the Maldives to adopt laws, regulations and guidelines related to maritime navigation, and to implement obligations that arise under international conventions ratified by the Maldives, including those conventions that seek to prevent vessel source pollution.⁸⁶

The *Draft Environment Protection Act* also maintains the requirement to formulate policies and guidelines for the protection and preservation of the environment in accordance with the needs of the country.⁸⁷ The draft act requires the Maldives to “make regulations for all matters prescribed under the Act”.⁸⁸ Importantly, the Maldives is given the power under the *Draft Environment Protection Act* to formulate laws to give effect to international conventions and agreements that the Maldives has ratified or acceded to, including international conventions and agreements on environmental protection.⁸⁹ Legislative proposals are to be submitted to the Parliament in relation to bi-lateral or multi-lateral conventions that the country is party to.⁹⁰ The policies, regulations, guidelines and legislative proposals must be based on scientific and environmental principles and take into account the practicality and availability of appropriate technology.⁹¹

From the above analysis of Maldivian national laws on flag State prescriptive jurisdiction, it can be argued that the applicable national laws *do* fulfil the State obligation to prescribe laws for the protection and preservation of the marine environment. However, there appears to be some gaps in the implementation of applicable international conventions which need to be addressed. Indeed, the national legal framework does not provide any obligation to formulate laws specifically designed to prevent vessel source pollution from substances such as oil, noxious liquid substances, packaged goods, garbage and sewage, as provided in the LOS Convention⁹² and MARPOL 73/78.⁹³

However, as the *Draft Environment Protection Act* requires the formulation of laws to prevent the emission of substances that deplete the ozone layer within special pollution prevention areas,⁹⁴ it could be argued that the Maldives has

86 Article 65 of the Draft Navigation Act.

87 Articles 2 and 6(a) of the Draft Environment Protection Act.

88 Article 37(a) of the Draft Environment Protection Act.

89 Articles 6(g) and 29(2)(1) of the Draft Environment Protection Act.

90 Article 29(a-1) of the Draft Environment Protection Act.

91 Article 15(b) of the Draft Environment Protection Act.

92 See analysis of Articles 211(2) and 212 of the LOS Convention in Section 5.1.

93 Article 11(1)(a) of MARPOL 73/78.

94 Article 10(b)(1) and 12(a) of the Draft Environment Protection Act.

an obligation to formulate laws to prevent the emission of harmful substances from the exhausts of vessels under flag State jurisdiction in special pollution prevention areas.

Furthermore, the national legal framework does not obligate the flag State to adopt laws and regulations which allow the Maldives to take “other measures necessary” to prevent vessel source pollution. These measures could include the formulation of government policies, guidelines and rules governing the flagging of vessels (to ensure compliance by vessels), or procedures for payment of adequate compensation to parties that have been affected by a pollution incident, as provided by the LOS Convention.⁹⁵ In addition, none of the applicable national laws impose a requirement on Maldives to fulfil the international obligation to communicate the text of its laws and other relevant documents to the appropriate international organisation.⁹⁶

3. FLAG STATE ENFORCEMENT JURISDICTION OVER THE PREVENTION OF VESSEL SOURCE POLLUTION

The main cause of vessel source pollution incidents is a lack of enforcement of the obligations that exist under international conventions by flag States.⁹⁷ International law provides rights for flag States to exercise prescriptive jurisdiction over vessels under their flag or of their registry despite the location of the vessels. As a consequence of these rights, flag States are obliged to exercise enforcement jurisdiction⁹⁸ at the national level in accordance with

95 See Section 5.1.

96 Article 11(a) of MARPOL 73/78.

97 Other significant causes of vessel source pollution incidents are inexpensive and untrained labour onboard vessels. Edwin Anderson, ‘The Nationality of Ships and Flags of Convenience: Economics, Politics and Alternatives’ (1997) 29 *Tulane Maritime Law Journal* 139 at 162; Pfeil confirms Anderson’s observation. Julia Pfeil, *The Torrey Canyon* (Max Planck Institute for Comparative Public Law and Oxford University Press, 2006); Human error is also a primary cause of marine accidents; Inho Kim, ‘Ten years after the enactment of the Oil Pollution Act of 1990: a success or a failure’ (2002) 26 *Marine Policy* 197 at 200; Other factors contributing to vessel source pollution incidents include old vessels, a marketplace looking for cheap freight rates, a lax vessel inspection system, injudicious or incompetent bureaucrats, as well as the unforgiving power of nature. Michael G. Chalos, ‘Should I Go Down With The Ship, Or Should I Rot In Jail – A Modern Master’s Dilemma’ (2003) (132) *Maritime Studies* 1 at 3; Kai W. Wirtz and Xin Liu, ‘Total oil spill costs and compensations’ (2006) 33(1) *Maritime Policy and Management* 49 at 55.

98 Camille Goodman, ‘The Regime for Flag State Responsibility in International Fisheries law- Effective Fact, Creative Fiction, or Further Work Required?’ (2009) 23 *Australian and New Zealand Maritime Law Journal* 157 Creative Fiction, or Further Work Required?</title><secondary-title>Australian and New Zealand Maritime Law Journal </secondary-title></titles><pages>157</pages><volume>23</

internationally agreed-upon standards, for the protection of the marine environment.⁹⁹

The scope and content of flag State obligations over the exercise of enforcement jurisdiction under international law have grown exponentially over time.¹⁰⁰ International law provides detailed technical standards that flag States are required to enforce for the protection and preservation of the marine environment from vessel source pollution.¹⁰¹ This section will analyse flag State enforcement jurisdiction and the obligations provided in the LOS Convention and MARPOL 73/78 for the prevention of vessel source pollution. Furthermore, the section will examine the gaps that exist between the applicable provisions in the LOS Convention and MARPOL 73/78, and the Maldivian national laws with respect to the exercise of flag State enforcement jurisdiction.

3.1 Flag State Enforcement Jurisdiction under the LOS Convention and MARPOL 73/78 over the Prevention of Vessel Source Pollution

Both the LOS Convention and MARPOL 73/78 rely on flag States¹⁰² as the primary agent to implement their respective obligations over vessels engaged in international navigation.¹⁰³ Flag States must ensure that the responsibilities of enforcement are fulfilled on a reasonable and practicable basis in accordance with the LOS Convention, MARPOL 73/78 and compatible internal laws.¹⁰⁴

volume><dates><year>2009</year></dates><label>A. Articles/Books/Reports</label><urls></urls><access-date>24 January 2010</access-date></record></Cite></EndNote> at 157.

99 Christopher C. Joyner, 'The international ocean regime at the new millennium: a survey of the contemporary legal order' (2000) 43 *Ocean & Coastal Management* 163 at 192.

100 See generally David Anderson, 'The Roles of Flag States, Port States, Coastal States and International Organisations in the Enforcement of International Rules and Standards Governing the Safety of Navigation and the Prevention of Pollution from Ships Under the UN Convention of the Law of the Sea and other International Agreements' (1998) 2 *Singapore Journal of International & Comparative Law* 557.

101 *Ibid.*

102 Haijiang Yang, *Jurisdiction of the Coastal State over Foreign Merchant Ships in Internal Waters and the Territorial Sea* (Springer, 2006); L.C. Sahatjian and D.E. Joseph, 'MARPOL- An Adequate Regime?: A Questioning Look at Port and Coastal State Enforcement' (Paper presented at the International Oil Spill Conference, Washington, 1998) at 2.

103 Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 501.

104 Article 94(2) of the LOS Convention. Under this article, flag States must exercise jurisdiction under their internal laws over vessels flying their flag; Mary George, 'Transit Passage and Pollution Control in Straits under the 1982 Law of the Sea Convention' (2002) 33 *Ocean Development & International Law* 189; It is a serious problem that States fail to implement and enforce international treaties such as MARPOL 73/78 and the LOS Convention; Peet has argued that the most serious problem at present

The LOS Convention and MARPOL 73/78 provide six obligations that flag States are required to enforce over vessels entitled to fly their flags in relation to the protection and preservation of the marine environment from vessel source pollution. They are: (i) the obligation to regulate the discharge of pollutants from vessels; (ii) the obligation to detect unlawful discharges from vessels; (iii) the obligation to conduct statutory surveys to ensure that vessels comply with laws on the prevention of pollution; (iv) the obligation to issue and endorse shipboard documentation; (v) the obligation to ensure that harmful substances are appropriately packaged, labelled and stowed onboard vessels; and (vi) the obligation to investigate reports of non-compliance by vessels under their registry by other States. Each of these obligations will now be analysed.

3.1.1 The Obligation to Regulate Discharge of Pollutants from Vessels

States are required to implement measures to minimise, to the fullest possible extent, the release of (or discharge of) toxic, harmful or noxious substances from vessels.¹⁰⁵ Despite this general obligation in the LOS Convention to minimise pollution from vessels, the treaty does not provide specific technical standards to guide States in this regard. Rather, the technical standards regulating the discharge of pollutants from vessels are contained in the six annexes of MARPOL 73/78.¹⁰⁶

Each annex of MARPOL 73/78 provides detailed technical standards tailored for a particular substance or category of substances, namely oil, noxious liquid substances carried in bulk, dangerous goods carried in packaged form, sewage, garbage and harmful substances emitted through vessel exhausts. Annexes I and II regulate the discharge of oil and noxious liquid substances carried in bulk and must be implemented by all State parties to MARPOL 73/78.¹⁰⁷ However,

is the implementation and enforcement of international treaties such as MARPOL 73/78 and the LOS Convention by States, rather than the need to develop new international regulations. Gerard Peet, 'International Co-operation to Prevent Oil Spills at Sea: Not Quite the Success It Should Be' in Helge Ole Bergesen and Georg Parmann (eds), *Green Globe Yearbook of International Co-operation on Environment and Development* (Oxford University Press, 1994) page 51.

105 Article 194(3) of the LOS Convention.

106 MARPOL 73/78 seeks to reduce vessel source pollution by requiring flag States to regulate the discharge of pollutants from vessels. Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 496.

107 Although Annex II is mandatory, the 1978 Protocol separated it from Annex I and allowed States to defer implementation of Annex II, as Annex II was lacking in State support for at least three years after the Protocol's entry into force. The delay in implementing Annex II was to facilitate the ratification of MARPOL 73/78 by States and its entry into force. Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge University Press, 2006) page 138.

the regulations in Annexes III, IV, V and VI are not legally binding on all flag States. Instead, States have the discretion to choose some, all or none of the subsequent four annexes of MARPOL 73/78.¹⁰⁸ For the purpose of analysis in this section, the detailed regulations in the six annexes of MARPOL 73/78 have been classified into four broad categories of substances. They are: (i) oil; (ii) noxious and harmful substances (both liquid and packaged); (iii) garbage and sewage; and (iv) harmful substances emitted through vessel exhausts.

3.1.1.1 The Obligation to Regulate Discharge of Oil and Oily Waste from Vessels

Oil pollution poses a major threat to marine species and the environment.¹⁰⁹ The occurrence of oil spills at sea, and the subsequent damage to coastlines around the world, is a high profile issue that attracts a great deal of public scrutiny.¹¹⁰

Vessels discharge oil residues into the marine environment as part of their normal operations.¹¹¹ There are two types of oily residues or waste that accumulate on vessels as part of their normal operations - oily bilge wastes

108 Article 14(1) of MARPOL 73/78; To complement the six Annexes, two protocols were adopted, dealing with Reports on Incidents involving Harmful Substances and Arbitration. Articles 8 and 10 of MARPOL 73/78 respectively give effect to the two protocols; Annex VI was added to MARPOL 73/78 by the 1997 Protocol to the Convention; Annexes to MARPOL 73/78 are generally developed in response to vessel source pollution incidents. See E Gold, 'Liability and Compensation for Ship-Source Marine Pollution: The International System' in Helge Ole Bergesen, Georg Parmann and Øystein B. Thommessen (eds), *Yearbook of International Co-operation on Environment and Development 1999/2000* (Earthscan Taylor & Francis Group, 2000) ; and G Mattson, 'MARPOL 73/78 and Annex I: An Assessment of its Effectiveness' (2006) 9 *Journal of International Wildlife Law and Policy* 175 at 189.

109 W. K. Talley, D. Jin and H. Kite-Powell, 'Post OPA-90 vessel oil spill differentials: transfers versus vessel accidents' (2004) 31(3) *Maritime Policy and Management* 225; "Oil" is defined in Regulation I of Annex I of MARPOL 73/78 as "petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products"; In this context, oil includes fuel carried as bunker and fuel utilised for the propulsion of vessels and machinery.

110 Gold states that "The media love maritime accidents, which are gripping and exciting and provide great video images – permitting reporters, totally untrained in maritime matters, to embarrass government officials and politicians. If oil pollution is involved, all the better!". E Gold, 'Liability and Compensation for Ship-Source Marine Pollution: The International System' in Helge Ole Bergesen, Georg Parmann and Øystein B. Thommessen (eds), *Yearbook of International Co-operation on Environment and Development 1999/2000* (Earthscan Taylor & Francis Group, 2000) page 31.

111 J.J Opaluch, 'Marine Pollution and Environmental Damage Assessment: Introduction' (1987) 4 *Marine Resource Economics* 151; David O'Connell, *Port State Control: International cooperation on marine pollution enforcement* (2009) U.S. Coast Guard Office of Maritime and International law <http://www.uscg.mil/proceedings/summer2009/articles/58_O'Connell_Port%20State%20Control.pdf> at 24 March 2020 page 59.

and oily sludge wastes. Oily bilge wastes develop when the drippings of oil from the complex machinery aboard a vessel collect and mix with seawater in the bilge (bottom) of the vessel.¹¹² A thick and oily waste, often referred to as sludge, is produced as a by-product of the fuel and lube oil purification processes needed for the operation of the vessel.¹¹³ The handling of oily waste is a constant challenge for vessel operators because it is continually produced, and the operation and maintenance of pollution prevention equipment takes time and effort. Additionally, shore based disposal options can be costly. This has led some vessels to discharge oily waste overboard.¹¹⁴

The disposal of excessive levels of oil by vessels is often incompatible with other users of the marine environment, such as the general public. Indeed, the environment and the public are better served through the reduction or prevention of oil releases from vessels,¹¹⁵ rather than through subsequent clean up and restoration actions.¹¹⁶ This section analyses the regulations provided in Annex 1 of MARPOL 73/78 that are designed to reduce the discharge of oil and oily waste into the marine environment from vessels.

Many techniques have been developed to facilitate the discharge of oil by vessels both at sea and along coastlines.¹¹⁷ These techniques and the general effects of oil on the marine environment are not addressed in this article as they are not directly relevant to flag State enforcement jurisdiction for the protection and preservation of the marine environment from vessel source pollution. A complete account of the effects of various types of oil on the marine environment is provided by Mattson.¹¹⁸

112 David O'Connell, Port State Control: International cooperation on marine pollution enforcement (2009) U.S. Coast Guard Office of Maritime and International Law <http://www.uscg.mil/proceedings/summer2009/articles/58_O'Connell_Port%20State%20Control.pdf> at 24 March 2020 page 59.

113 Ibid.

114 Ibid.

115 J.F. Leeder and L Cooper, 'Bunker Fuel Weathering Study' (Australia Maritime Safety Authority, 2005) page 6.

116 Roger C. Helm, R. Glenn Ford and Harry R. Carter, 'The Oil Pollution Act of 1990 and Natural Resource Damage Assessment' (2006) (34) Marine Ornithology 99.

117 One such technique is Bioremediation. See N.C. Duke, Burns K.A. and R.P.J. Swannell, 'Research into the Bioremediation of Oil Spills in Tropical Australia: with particular emphasis on oiled mangrove and salt marsh habitat' (Australian Institute of Marine Science and AEA Technology UK, 1999) page 18.

118 See G Mattson, 'MARPOL 73/78 and Annex I: An Assessment of its Effectiveness' (2006) 9 Journal of International Wildlife Law and Policy 175; See also Meese for the ecological effects of oil in the marine environment. Section B of Sally A. Meese, 'When Jurisdictional interests collide: International, domestic, and state efforts to prevent vessel source oil pollution' (1982) 12(1) Ocean Development & International Law 71 at 77; An in-depth description of the behaviour of spilled oil is provided by Tanker Owners Pollution Federation Ltd (ITOPF), <www.itopf.com> at 25 March 2020.

In general, the applicability of MARPOL 73/78 depends on the size, type and age of vessels. Flag States may exempt certain classes of vessels from the technical provisions contained in the Annexes of MARPOL 73/78.¹¹⁹ However, such exemptions must be duly publicised and communicated to the IMO.¹²⁰ As a basic rule, Annex I of MARPOL 73/78 applies to oil tankers of 150 gross tonnage and above, and other vessels (non tankers) of 400 gross tonnage and above.¹²¹

Flag States have an obligation to enforce the operational discharge standards prescribed in Annex I of MARPOL 73/78 applicable to tankers and non tankers. The standard provides that a tanker may not leak more than 1/30,000th of its total carrying capacity into the ocean.¹²² Furthermore, the rate at which oil may be discharged from a tanker must not exceed thirty litres per mile travelled.¹²³ Annex I of MARPOL 73/78 also provides that a tanker must not discharge any oil whatsoever within fifty miles of the nearest land or in certain special areas.¹²⁴ For non tankers, the standards are not as stringent.¹²⁵

Flag States also have an obligation to enforce the maximum allowable discharge rate (or the Instantaneous Rate of Discharge¹²⁶) of 15 parts per million (ppm)¹²⁷ while non tankers are *en route*¹²⁸ outside special areas.¹²⁹ With the exception of the maximum rate of allowable discharge in Annex I of MARPOL 73/78, flag States have power to approve the discharge of substances containing oil into the sea, for the purpose of combating specific pollution incidents in order to

119 Regulations 3.1, 3.3, 3.4 and 3.5 of Annex I of MARPOL 73/78.

120 Regulation 3.2 of Annex I of MARPOL 73/78.

121 Regulation 2.1 of Annex I of MARPOL 73/78.

122 Regulation 34.2.5 of Annex I of MARPOL 73/78.

123 Regulation 34.2.4 of Annex I of MARPOL 73/78.

124 Regulation 34.2.2 of Annex I of MARPOL 73/78.

125 Regulations 15 to 17 of Annex I of MARPOL 73/78; Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) Indiana Journal of Global Legal Studies 489.

126 Regulation 1.12 of Annex I of MARPOL 73/78 defines: "instantaneous rate of discharge of oil" as "the rate of discharge of oil in litters per hour at any instant divided by the speed of the ship in knots at the same instant."

127 Regulation 15.2.3 of Annex I of MARPOL 73/78; Parts per million (ppm) means parts of oil per million parts of water by volume. Regulation 1.29 of Annex I of MARPOL 73/78.

128 Regulation 15.2.1 of Annex I of MARPOL 73/78; En route means that the vessel is underway at sea on a course or courses, including deviation from the shortest direct route, which is as far as practicable for navigation purposes. Regulation I of Annex II of MARPOL 73/78.

129 Regulation 15A of Annex I of MARPOL 73/78; "Special areas" means "a sea area where, for recognised technical reasons in relation to its oceanographical and ecological condition and to the particular character of its traffic, the adoption of special mandatory methods for the prevention of sea pollution by oil is required". Regulation 1(11) of Annex I of MARPOL 73/78.

minimise damage to the marine environment from oil pollution.¹³⁰

Flag States must ensure that vessels are equipped with shipboard technology to manage and retain onboard oil residues that exceed the maximum level that be released into the marine environment under Annex I of MARPOL 73/78.¹³¹ Oil residues not meeting the relevant standards of MARPOL 73/78 must be retained onboard for subsequent disposal into shore reception facilities.¹³² It is generally accepted that the regulation of shipboard gear and discharge requirements prescribed in MARPOL 73/78 are the best means of preventing oil pollution from vessels.¹³³

3.1.1.2 The Obligation to Regulate Discharge of Noxious Liquid Substances and Harmful Substances in Packaged Form from Vessels

Although the number of oil spills from vessels is falling, spills from other pollutants such as noxious liquid substances and harmful substances in packaged form are on the increase.¹³⁴ Indeed, the threat of pollution from these particular substances, which are persistent in nature, is substantial.¹³⁵ There is a general consensus that noxious liquid substances carried in bulk and harmful substances in packaged form could potentially be more toxic to the marine environment and human health than oil.¹³⁶ Under Annexes II and

130 Regulation 4.3 of Annex I of MARPOL 73/78.

131 Regulation 12 of Annex I of MARPOL 73/78. For example Regulation 12 of Annex I of MARPOL 73/78 states: "Every ship of 400 gross tonnage and above shall be provided with a tank or tanks of adequate capacity, having regard to the type of machinery and length of voyage, to receive the oil residues (sludge) which cannot be dealt with otherwise in accordance with the requirements of this Annex".

132 Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge University Press, 2006) page 131.

133 See for example, D Pietri et al, 'The Arctic Shipping and Environmental Management Agreement: A Regime for Marine Pollution' (2008) 36 *Coastal Management* 508.

134 Regulation 1 of Annex II of MARPOL 73/78 defines "Noxious Liquid Substances as "any substance indicated in the Pollution Category column of Chapter 17 or 18 of the International Bulk Chemical Code or provisionally assessed under the provisions of Regulation 6 as falling into category X, Y or Z"; Article 2 of MARPOL 73/78 defines a "harmful substance" as, "any substance which, if introduced into the sea, is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea, and includes any substance subject to control by the present convention".

135 David Vanderzwaag, 'The Precautionary Principle and Marine Environmental Protection: Slippery Shores, Rough Seas, and Rising Normative Tides' (2002) 33 *Ocean Development & International Law* 165; Vessels carrying hazardous cargo may be regarded as inherently threatening to the coast of States. Kamal-Deen Ali, 'Legal and Policy Dimensions of Coastal Zone Monitoring and Control: The Case in Ghana' (2004) 35 *Ocean Development & International Law* 179.

136 Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation*

III of MARPOL 73/78, flag States must regulate the discharge of noxious liquid substances and harmful substances in packaged form carried onboard vessels under their registry.¹³⁷

The provisions in MARPOL 73/78 dealing with noxious liquid substances and harmful substances in packaged form are extremely complex.¹³⁸ The basic principle in Annexes II and III of MARPOL 73/78 is that noxious liquid substances must be disposed in an environmentally sound manner,¹³⁹ while harmful substances carried in packaged form must not be disposed at all. The total ban on the disposal of harmful substances carried in packaged form is applicable to vessels at sea and in ports. Annex II of MARPOL 73/78 introduced a system to control the discharge of noxious liquid substances based on certain thresholds, such as the distance from land, the nature and concentration of effluents and the depth of the sea at the place of discharge.¹⁴⁰

MARPOL 73/78 stipulates three operational standards that flag States must enforce in regard to the discharge of noxious liquid substances into the marine environment. The first standard is that noxious liquid substances must be discharged when the vessel is proceeding *en route* at a speed of at least 7 knots (in the case of self-propelled vessels) or at least 4 knots (in the case of vessels which are not self-propelled).¹⁴¹ The second standard is that the discharge must be made below the water line through an underwater discharge outlet not exceeding the maximum rate for which the underwater discharge outlet is designed.¹⁴² The third standard is that the discharge must be made at a distance

(Cambridge University Press, 2006) page 133; Karim Saiful Md, 'Implementation of the MARPOL Convention in Bangladesh' (2009) 6 Macquarie Journal of International and Comparative Environmental Law 51; According to Charlebois, noxious liquid substances and harmful substances in packaged form present a higher degree of hazard not only to the marine environment, but also to human health. Patricia Charlebois, The Role of International Instruments in Addressing Prevention, Preparedness and Response to Oil Pollution and the Extension of These to Address the Challenge of Hazardous And Noxious Substances (HNS) (2008) <<http://www.iosc.org/papers/2008%20012.pdf>> at 24 March 2020.

137 Amy E. Moen, 'Breaking Basel: The elements of the Basel Convention and its application to toxic ships' (2008) 32 Marine Policy 1053.

138 R Churchill and A.V. Lowe, The Law of the Sea (Manchester University Press, 3rd ed 1999) page 340.

139 Louise Angélique de La Fayette, 'The Sound Management of Wastes Generated at Sea- MARPOL, not Basel' (2009) 39(4-5) Environmental Policy and Law 207.

140 Annex II applies to all vessels certified to carry liquid substances in bulk. Regulation 2 of Annex II of MARPOL 73/78; International Maritime Organization, Annex II: Control of Pollution by Noxious Liquid Substances <http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258#8> at 24 March 2020; Karim Saiful Md, 'Implementation of the MARPOL Convention in Bangladesh' (2009) 6 Macquarie Journal of International and Comparative Environmental Law 51.

141 Regulation 13.2.1.1 of Annex II of MARPOL 73/78.

142 Regulation 13.2.1.2 of Annex II of MARPOL 73/78.

of not less than 12 nautical miles from the nearest land at a water depth not less than 25 meters.¹⁴³

The discharge of noxious liquid substances is totally prohibited within 12 nautical miles of the nearest land.¹⁴⁴ Under Annex II of MARPOL 73/78, the discharge of residues containing noxious liquid substances must be made at a reception facility, unless they are adequately diluted in accordance with the detailed technical requirements of the Annex.¹⁴⁵

Annex III of MARPOL 73/78 seeks to prevent or minimise pollution from harmful substances in packaged form by laying down standards concerning the packaging, marking, labelling, stowage and quantity of such substances.¹⁴⁶ Indeed, MARPOL 73/78 requires flag States to entirely prohibit the jettisoning of harmful substances carried in packaged form.¹⁴⁷ The only exception to this regulation is where the jettisoning is “necessary for the purpose of securing the safety of the ship or saving life at sea”.¹⁴⁸ The obligation to regulate the labelling, packaging and stowage of harmful substances carried in packaged form is analysed under Section 5.1.5.

3.1.1.3 The Obligation to Regulate Discharge of Sewage and Garbage from Vessels

Flag State jurisdiction for the protection and preservation of the marine environment from sewage and garbage from vessels is provided in Annexes IV¹⁴⁹ and V¹⁵⁰ of MARPOL 73/78 respectively. Flag States have the obligation to regulate the discharge of sewage and garbage from vessels under their registry, subject to special requirements and exceptions.¹⁵¹ Annexes IV and V

143 Regulation 2.1.3 of Annex II of MARPOL 73/78.

144 International Maritime Organization, Annex II: Control of Pollution by Noxious Liquid Substances <http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258#8> at 24 March 2020; Karim Saiful Md, ‘Implementation of the MARPOL Convention in Bangladesh’ (2009) 6 Macquarie Journal of International and Comparative Environmental Law 51.

145 Regulation 13 of Annex II of MARPOL 73/78.

146 R Churchill and A.V. Lowe, *The Law of the Sea* (Manchester University Press, 3rd ed 1999) page 340; The Annex applies to all vessels carrying harmful substances in packaged form. No exceptions or exemptions are provided in the Annex. Regulation 1 of Annex III of MARPOL 73/78.

147 Regulation 13.2 of Annex III of MARPOL 73/78.

148 Regulation 7 of Annex III of MARPOL 73/78.

149 The Annex applies to vessels more than 400 Gross Tonnage; Regulation 2 of Annex IV of MARPOL 73/78.

150 The Annex applies to all vessels under Regulation 2 of Annex V of MARPOL 73/78. No exceptions or exemptions are provided in the Annex.

151 One exception is “the disposal of garbage from ships necessary for the purpose of securing the safety

also impose obligations on vessels to manage their own sewage and garbage onboard vessels.¹⁵² It is widely accepted that the regulations in MARPOL 73/78 have helped to reduce the amount of garbage on beaches and in the oceans of the world.¹⁵³

MARPOL 73/78 requires flag States to prohibit the discharge of sewage within three nautical miles from land.¹⁵⁴ Between four and twelve nautical miles from land, sewage must be comminuted and disinfected by a sewage treatment plant approved by the flag State before discharge.¹⁵⁵ The discharge of sewage into the sea must be undertaken at a moderate rate when the vessel is *en route* and proceeding at not less than four knots.¹⁵⁶ Flag States have jurisdiction to regulate the rate of discharge of sewage from vessels in accordance with applicable generally accepted international standards.¹⁵⁷

Annex V of MARPOL 73/78 aims to prevent the discharge of vessel generated garbage such as plastics, including synthetic fishing nets, into the marine environment.¹⁵⁸ “Garbage” is defined in Annex V of MARPOL 73/78 as “all kinds of victual, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of vessels”.¹⁵⁹ States are obliged to prohibit the disposal at sea of floating dunnage and packing materials any nearer to land than 25 nautical miles. In addition, the disposal of food waste and other garbage, such as rags, paper and glass are prohibited closer to land than 12 nautical miles.¹⁶⁰ Annex V of MARPOL 73/78 completely prohibits the

of a ship and those onboard or saving life at sea”. Regulation 4.1 of Annex IV of MARPOL 73/78.

152 Regulation 2 of Annex IV and Regulation 2 of Annex V of MARPOL 73/78.

153 See for example, Seba B. Sheavly, ‘Marine Debris - an Overview of a Critical Issue for Our Oceans’ (Paper presented at the Sixth Meeting of the UN Open-ended Informal Consultative Process of Oceans and the Law of the Sea, New York, June 6-10, 2005); and M White, *Australasian Marine Pollution Laws* (The Federation Press, 2nd ed 2007).

154 Regulation 11.1.1 of Annex IV of MARPOL 73/78.

155 R Churchill and A.V. Lowe, *The Law of the Sea* (Manchester University Press, 3rd ed 1999) page 341.

156 Regulation 11.1.1 of Annex IV of MARPOL 73/78; Annex IV does not contain a definition of the phrase “moderate rate”.

157 Regulation 11.1.1 of Annex IV of MARPOL 73/78.

158 Joel R. Whitehead, *Reducing Plastic Pollution in the Marine Environment: The U.S. Coast Guard and Implementation of Annex V of MARPOL 73/78*, Port Safety and Security Division, U.S. Coast Guard Headquarters <<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=arnumber=794993>> at 9 March 2020 page 1511.

159 Regulation 1(1) of Annex V of MARPOL 73/78; Christopher C. Joyner and Scot Frew, ‘Plastic pollution in the marine environment’ (1991) 22(1) *Ocean Development & International Law* 33.

160 Article 2(3)(b)(i) of MARPOL 73/78; Christopher C. Joyner and Scot Frew, ‘Plastic pollution in the marine environment’ (1991) 22(1) *Ocean Development & International Law* 33.

disposal of garbage in some areas such as the North Sea and the Antarctic.¹⁶¹ However, the intentional discharge of garbage at any location is permitted “for the purpose of securing the safety of a ship and those onboard or saving life at sea.”¹⁶²

3.1.1.4 The Obligation to Regulate Emissions from the Exhaust of Vessels

During the burning process of marine bunker fuel oil in engines, boilers and incinerators onboard, vessels produce significant amounts of black smoke. This smoke consists of nitrogen oxides, unburned hydrocarbons, sulfur oxides, carbon monoxide and carbon dioxide (among other substances).¹⁶³ These pollutants have the capacity to deplete the ozone layer, enhance the greenhouse effect and produce acid rain, as well as being detrimental to human health. It is therefore not surprising that, emissions from vessels have attracted a great deal of public concern.¹⁶⁴

Under Annex VI of MARPOL 73/78, flag States must enforce international policies and measures to mitigate the emission of pollutants from vessels.¹⁶⁵ Indeed, MARPOL 73/78 calls for a 30% reduction in the emissions of pollutants from vessels.¹⁶⁶

161 Joel R. Whitehead, Reducing Plastic Pollution in the Marine Environment: The U.S. Coast Guard and Implementation of Annex V of MARPOL 73/78, Port Safety and Security Division, U.S. Coast Guard Headquarters <<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=arnumber=794993>> at 9 March 2020, page 1511.

162 Article 2(3)(b)(i) of MARPOL 73/78; Christopher C. Joyner and Scot Frew, ‘Plastic pollution in the marine environment’ (1991) 22(1) *Ocean Development & International Law* 33.

163 Bin Lin and Cherg-Yuan Lin, ‘Compliance with international emission regulations: Reducing the air pollution from merchant vessels’ (2006) 30 *Marine Policy* 220.

164 Bin Lin and Cherg-Yuan Lin, ‘Compliance with international emission regulations: Reducing the air pollution from merchant vessels’ (2006) 30 *Marine Policy* 220; The next form of pollution that will most likely be regulated at the international level is noise pollution from vessels, which is an emerging issue. Firestone and Jarvis state that with the rise in commercial shipping, the ocean is becoming an increasingly noisy environment. See generally J Firestone and C Jarvis, ‘Response and Responsibility: Regulating Noise Pollution in the Marine Environment’ (2007) 10 *Journal of International Wildlife Law and Policy* 109.

165 “Emission” means “any release of substances from vessels into the atmosphere or sea”. Regulation 2.3 of Annex VI to MARPOL 73/78; J. Charney, ‘The Marine Environment and the 1982 United Nations Convention on the Law of the Sea’ (1994) 28 *International Lawyer* 879 at 889; Christian Pisani, ‘Fair at Sea: The Design of a Future Legal Instrument on Marine Bunker Fuels Emissions within the Climate Change Regime’ (2002) 33 *Ocean Development & International Law* 57; Annex VI was entered into force on May 19 2005. Karim Saiful Md, ‘Implementation of the MARPOL Convention in Bangladesh’ (2009) 6 *Macquarie Journal of International and Comparative Environmental Law* 51.

166 Claire et al Granier, ‘Ozone pollution from future ship traffic in the Arctic northern passages’ (2006)

The primary principle under Annex VI is to oblige vessels to install appropriate pollution reduction equipment¹⁶⁷ and to regulate the quality of bunker fuel oil used onboard, thereby reducing the emission of pollutants from vessels. Under Annex VI of MARPOL 73/78, flag States must ensure that vessels install an exhaust gas cleaning system which is approved by the flag State in order to reduce the emission of nitrogen oxide from vessels up to the technical limits prescribed in MARPOL 73/78.¹⁶⁸ Flag States must also ensure that the sulphur content of any fuel used onboard vessels does not exceed 4.5 m/m¹⁶⁹ (in order to limit the emission of sulphur oxide from vessels). Annex VI of MARPOL 73/78 applies to all vessels,¹⁷⁰ with the annex prohibiting the deliberate emission of ozone-depleting substances in excess of the limits provided in the annex.¹⁷¹

3.1.2 The Obligation to Detect Unlawful Discharges from Vessels

State parties to MARPOL 73/78 are required to use all appropriate and practicable measures to detect unlawful discharges from vessels.¹⁷² Flag States are required to ensure that vessels under their registry are equipped with systems that can monitor and control discharges from vessels. Like a 'black box' in an aircraft, the monitoring systems onboard vessels are to continuously record the discharge in litres per nautical mile, the total quantity discharged, the content of pollutants discharged and the rate of discharge.¹⁷³ All record

33 Geophysical Research Letters 1 at 2.

167 Bin Lin and Cheng-Yuan Lin, 'Compliance with international emission regulations: Reducing the air pollution from merchant vessels' (2006) 30 Marine Policy 220.

168 Regulation 13.3.b.1 of Annex VI of MARPOL 73/78. Technical limits are prescribed in Regulation 13.3.a of the same annex. Regulation 13.3.a states that, subject to Regulation 3 of the Annex, the operation of each diesel engine to which the regulation applies is prohibited, except when the emission of nitrogen oxide (calculated as the total weighted emission of NO₂) from the engine is 17.0 g/kW when emission is less than 130 rpm.

169 Regulation 14.1 of Annex VI of MARPOL 73/78.

170 Regulation 1 and 3 of Annex VI of MARPOL 73/78.

171 Regulation 12.1 of Annex VI of MARPOL 73/78; "Ozone-depleting substances" means "controlled substances defined in paragraph 4 of Article 1 of the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987". Regulation 2.6 of Annex VI of MARPOL 73/78.

172 Article 6(1) of MARPOL 73/78; Gerard Peet, 'International Co-operation to Prevent Oil Spills at Sea: Not Quite the Success It Should Be' in Helge Ole Bergesen and Georg Parmann (eds), Green Globe Yearbook of International Co-operation on Environment and Development (Oxford University Press, 1994) page 47; Various annexes emphasise the detection of unlawful discharge. For example, Regulation 11 of Annex VI of MARPOL 73/78 states that flag States are obliged to use all appropriate and practical measures of detection and monitoring of air pollution and implement adequate procedure for reporting and accumulation of evidence.

173 Regulation 15(3)(a) of Annex I of MARPOL 73/78.

entries must note the time and date and be kept for at least three years.¹⁷⁴

IMO Resolution A.496(XII)¹⁷⁵ recognises three categories of cargo discharge monitoring systems that vessels may utilise, which are control units, computing units and calculating units.¹⁷⁶ The underlying reason for these monitoring systems is to make sure that a vessel's operational discharges meet the precise standards prescribed in MARPOL 73/78.¹⁷⁷

Various monitoring systems are used by States to detect unlawful discharges from vessels, including Remote Sensing Satellite Technology and Synthetic Aperture Radars.¹⁷⁸ These technologies are innovative developments in the control and monitoring of pollution in marine waters. Some countries, for example, those under the Bonn Agreement,¹⁷⁹ such as Norway, Netherlands and United Kingdom, have adopted these monitoring systems in order to meet their international obligations, including those under MARPOL 73/78.¹⁸⁰ Similarly, countries such as Brunei, Indonesia and Singapore have established satellite imagery monitoring programs to detect marine pollution in their maritime zones.¹⁸¹

174 Regulation 15(3)(a) of Annex I of MARPOL 73/78.

175 International Maritime Organization, 'Guidelines and Specifications for Oil Discharge Monitoring and Control Systems for Oil Tankers' (IMO, 1981).

176 The 'control units' system is the most sophisticated, automated and tamper-proof of the monitoring systems. It comes with devices which prevent the discharge valve from being opened when the monitoring system is out of order (starting interlock) and which close the valve when the discharge rate exceeds a permissible rate (discharge valve control). The second best monitoring device is the 'computing units' system. Although this system is also automated, it tracks less information and allows crews to manually insert data into the discharge record. Also, starting interlock and discharge valve control devices are not generally required for these systems. Finally, there is the basic 'calculating' system, where most of the data is manually entered. Starting interlock and discharge valve control are not required. Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 498.

177 Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 499.

178 Arts & Humanities Research Council, *Satellite Monitoring as a Legal Compliance Tool in the Environment Sector. Case Study Five: Oil Pollution in Marine Waters* (AHRC Report 21) <http://www.ucl.ac.uk/laws/environment/satellites/docs/21_Oil_Pollution.pdf> at 24 January 2020; See page 2 of the report for an in-depth analysis of the satellite imagery technology.

179 The Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances 1983 (the Bonn Agreement). Arts & Humanities Research Council, *Satellite Monitoring as a Legal Compliance Tool in the Environment Sector. Case Study Five: Oil Pollution in Marine Waters* (AHRC Report 21) <http://www.ucl.ac.uk/laws/environment/satellites/docs/21_Oil_Pollution.pdf> at 24 January 2020 at 14.

180 *Ibid*, at 7.

181 *Ibid*.

Although some countries have implemented discharge monitoring systems and programs to detect unlawful discharges from vessels and pollution of the marine environment, it is widely accepted that most State parties to MARPOL 73/78 are not using appropriate and practicable measures to detect unlawful discharges from vessels.¹⁸² Therefore, it can be said that most State parties are not fully complying with the requirements of MARPOL 73/78.¹⁸³

There are various reasons why States choose not to comply with the obligation to detect unlawful discharges from vessels. First of all, the detection of discharges in violation of MARPOL 73/78 requires well trained inspectors and substantial financial resources, which some countries have in limited supply. Furthermore, once a slick containing discharges is discovered, it is often difficult to build up sufficient evidence linking the slick to a particular vessel.¹⁸⁴ For many countries, these financial and practical challenges prevent them from complying with the obligation to detect unlawful discharges from vessels.¹⁸⁵

Although some flag States fail to comply with the obligation to detect unlawful discharges from vessels under their registry, vessels that discharge pollutants in excess of the standards prescribed in MARPOL 73/78 are likely to be prosecuted by port States of foreign countries when they call into such countries during their voyage. Indeed, port States have jurisdiction to conduct a visual check of a vessel's discharge monitoring equipment, provided such equipment is installed onboard the vessel.¹⁸⁶ If a port State reasonably believes that a vessel has unlawfully discharged pollutants during its voyage, the port State may undertake an in-depth investigation, such as examining the dirty ballast or oil residues stored in the vessel's slop tanks.¹⁸⁷ If the levels in the tanks are lower than normal, this could be used as evidence of a vessel's illegal discharge of

182 Gerard Peet, 'International Co-operation to Prevent Oil Spills at Sea: Not Quite the Success It Should Be' in Helge Ole Bergesen and Georg Parmann (eds), *Green Globe Yearbook of International Co-operation on Environment and Development* (Oxford University Press, 1994) at 47.

183 *Ibid.*

184 Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 501; If and when an oil slick is discovered, it is difficult to obtain enough evidence against the offending vessel in order to prove the violation. Therefore, the IMO needs to create a system apart from visual detection which can effectively identify oil slicks and detect the vessel responsible. G Mattson, 'MARPOL 73/78 and Annex I: An Assessment of its Effectiveness' (2006) 9 *Journal of International Wildlife Law and Policy* 175 at 190-191.

185 Gerard Peet, 'International Co-operation to Prevent Oil Spills at Sea: Not Quite the Success It Should Be' in Helge Ole Bergesen and Georg Parmann (eds), *Green Globe Yearbook of International Co-operation on Environment and Development* (Oxford University Press, 1994) page 48.

186 G Mattson, 'MARPOL 73/78 and Annex I: An Assessment of its Effectiveness' (2006) 9 *Journal of International Wildlife Law and Policy* 175 at 189-191.

187 *Ibid.*

pollutants into the marine environment.¹⁸⁸

3.1.3 The Obligation to Conduct Statutory Surveys to Ensure that Vessels Comply with Laws on Pollution Prevention

Flag States must ensure that vessels flying their flag or of their registry are in compliance with applicable international rules and standards for the prevention, reduction and control of pollution of the marine environment.¹⁸⁹ Flag States are also required to ensure that the master and officers of their vessels, as well as the crew (to the extent appropriate) are fully conversant with and observe the applicable international regulations concerning the safety of life at sea and the prevention, reduction and control of marine pollution.¹⁹⁰

Furthermore, flag States must ensure that the condition of the vessel and its equipment is maintained in conformity with the provisions of MARPOL 73/78, and that the vessel is, in all respects, fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment.¹⁹¹ The primary method for flag States to verify that vessels under their registry are in compliance or fully conversant with the applicable international regulations on crewing standards and conduction of vessels is to carry out periodic inspections or surveys onboard vessels.¹⁹²

MARPOL 73/78 requires flag States to conduct inspections before a vessel is put into service or when issuing pertinent documentation (which normally occurs every five years).¹⁹³ After the initial inspection, the timing of the surveys

188 *Ibid.*

189 Article 217(1) of the LOS Convention.

190 Article 94(4)(c) of the LOS Convention; States must ensure that the master of a vessel flying its flag renders assistance, as far as practical, to any person or vessel to minimise damage. Article 98 of the LOS Convention.

191 Regulation 6.4.1 of Annex I of MARPOL 73/78.

192 Under Article 217(3) of the LOS Convention, flag States must ensure that vessels flying their flag are periodically inspected in order to verify the actual conditions of the vessels; Under MARPOL 73/78, a flag State is vested with the exclusive right and duty to inspect and certify its vessels. Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 501.

193 An example of a document that is issued every 5 years is the International Oil Pollution Prevention Certificate (IOPP); The documents issued by flag States are analysed in Section 5.1; Regulation 6.3.4 of MARPOL 73/78 states that: "In every case, the Administration concerned shall fully guarantee the completeness and efficiency of the survey and shall undertake to ensure the necessary arrangements to satisfy the obligation".

varies, but at a minimum one must be conducted every five years.¹⁹⁴ MARPOL 73/78 prescribes different categories of surveys, including initial,¹⁹⁵ renewal,¹⁹⁶ intermediate,¹⁹⁷ annual¹⁹⁸ and additional surveys.¹⁹⁹ Furthermore, port States have jurisdiction to conduct surveys onboard foreign vessels visiting their ports.

Generally, flag States have great discretion over how to carry out periodic surveys on small vessels and non tankers.²⁰⁰ However, when conducting periodic surveys onboard tankers and large vessels to guarantee that their structure, equipment, fittings, arrangements and material fully comply with the applicable requirements of MARPOL 73/78, flag States have limited discretion.²⁰¹

A vessel which fails to pass a flag State survey cannot sail until it has been brought up to the standards prescribed in MARPOL 73/78.²⁰² Where a vessel does not comply with the technical requirement of MARPOL 73/78, the vessel must proceed to the nearest repair yard to rectify the deficiencies identified by the flag State.²⁰³ The latter jurisdiction can only be exercised if the flag State has clear grounds to believe that the non-compliant vessel cannot navigate “without presenting an unreasonable threat to the marine environment”.²⁰⁴ Flag State periodic surveys can only be carried out by officers of the administration²⁰⁵ or officers nominated to act on behalf of the flag State.²⁰⁶

194 Regulations 4 and 5 of Annex I of MARPOL 73/78.

195 Regulation 6.1.1 of Annex I, Regulation 8.1.1 of Annex II and Regulation 4.1.1 of Annex IV of MARPOL 73/78.

196 Regulation 6.1.2 of Annex I, Regulation 8.1.2 of Annex II and Regulation 4.1.2 of Annex IV of MARPOL 73/78.

197 Regulation 6.1.3 of Annex I and Regulation 8.1.3 of Annex II of MARPOL 73/78.

198 Regulation 6.1.4 of Annex I and Regulation 8.1.4 of Annex II of MARPOL 73/78.

199 Regulation 6.1.5 of Annex I, Regulation 8.1.5 of Annex II, Regulation 4.1 of Annex VI and Regulation 4.1.3 of Annex IV of MARPOL 73/78.

200 Andrew Griffin, ‘MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?’ (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 500.

201 *Ibid.*

202 *Ibid.*

203 Regulation 6.3.3 of Annex I of MARPOL 73/78.

204 Article 5(2) of MARPOL 73/78, Regulation 4.3.b of Annex I and Regulation 10.2.c of Annex II of MARPOL 73/78.

205 Regulation 6.3.1 of Annex I of MARPOL 73/78.

206 Regulations 4.2 to 4.9 of Annex VI of MARPOL 73/78; **Flag States may conduct a large part of their surveys through entities located in other countries.** Maritime International Secretariat Services Limited, ‘Shipping Industry Guidelines on Flag State Performance’ (2006) <www.marisec.org/flag-performance> at 9 March 2020 page 6; Similar archipelagos to the Maldives, such as the Union of Comoros, nominate officers in classification societies such as the American Bureau of Shipping, Det Norske Veritas, Germanischer Lloyd and Lloyds Register, in order to execute flag State control functions on their behalf. Union of

3.1.4 The Obligation to Issue and Endorse Onboard Documentation on Pollution control

Flag States are obliged to ensure that vessels flying their flag or of their registry carry onboard documentation, such as certificates, cargo record books and emergency plans, required by and issued pursuant to applicable international conventions such as MARPOL 73/78. The onboard documentation must be in conformity with the actual conditions of the vessels.²⁰⁷

3.1.4.1 Issuance and Endorsement of Certificates

For the effective implementation of MARPOL 73/78, the convention introduced a system governing the issuance and endorsement of certificates onboard vessels.²⁰⁸ Flag States have an obligation to issue and endorse: (i) an International Oil Pollution Prevention Certificate;²⁰⁹ (ii) an International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk;²¹⁰ (iii) an International Sewage Pollution Prevention Certificate;²¹¹ and (iv) an International Air Pollution Prevention Certificate.²¹² These certificates must be issued and endorsed by flag States to all vessels of the required size under their registry, subject to the relevant periodic surveys discussed above.

The onboard certificates serve as *prima facie* evidence that the vessel is in compliance with the various provisions of MARPOL 73/78. Indeed, the certificates are accepted by other States, i.e. coastal and port States of other countries, as evidence of the condition of the vessel.²¹³ Flag States are required to ensure that the documentation is accurate and up to date, as other States have jurisdiction to inspect the certificates while the vessel is docked in their ports.²¹⁴

Comoros, (2010) <<http://www.bihlyumov.com/classification.html>> at 19 January 2020.

207 Article 217(3) of the LOS Convention.

208 Karim Saiful Md, 'Implementation of the MARPOL Convention in Bangladesh' (2009) 6 Macquarie Journal of International and Comparative Environmental Law 51.

209 Regulations 7.1 and 7.2 of Annex I of MARPOL 73/78.

210 Regulation 9 of Annex II of MARPOL 73/78.

211 Regulations 5 and 6 of Annex IV of MARPOL 73/78.

212 Regulations 6, 7 and 8 of Annex VI of MARPOL 73/78.

213 Article 217(3) of the LOS Convention.

214 This represents a shift away from the primacy of flag State jurisdiction towards greater port State jurisdiction. David Anderson, 'The Roles of Flag States, Port States, Coastal States and International Organisations in the Enforcement of International Rules and Standards Governing the Safety of Navigation and the Prevention of Pollution from Ships Under the UN Convention of the Law of the Sea and other International Agreements' (1998) 2 Singapore Journal of International & Comparative Law

If a vessel has no certificates, or if its certificates are invalid, a port State may conduct an in-depth survey, which may delay the vessel from leaving the port. However, if a vessel is carrying a valid certificate from the flag State, the port State is obligated to honour the documents as if they were its own.²¹⁵ The only time a port State can go beyond the certificates and conduct an in-depth survey is if there are clear grounds for believing that the condition of the vessel or its equipment does not correspond substantially with the particulars of the certificates onboard.²¹⁶ Such action would be warranted in circumstances where, for example, a crew had removed monitoring equipment which was originally listed on the vessel's certificates.²¹⁷

3.1.4.2 The Obligation of Flag States to Ensure Vessels Carry Shipboard Emergency Plans and Complete Cargo Record Books

Flag States must ensure that vessels of the required size and type under their registry carry onboard a Shipboard Oil Pollution Emergency Plan²¹⁸ and a Shipboard Marine Pollution Emergency Plan for Noxious Liquid Substances²¹⁹ approved by the flag State. The emergency plans are designed to guide the crew in applying best practices in emergencies to reduce leakage of pollutants from the vessels into the marine environment. Furthermore, flag States must ensure that vessels with the relevant technical specifications complete an Oil Record Book²²⁰ and a Noxious Liquid Substance Cargo Record Book.²²¹ Flag States are also required to verify that applicable vessels carry and maintain a Garbage Record Book²²² pursuant to IMO guidelines.²²³

557 at 577.

215 Article 217(3) of the LOS Convention and Article V of MARPOL 73/78; Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 501.

216 Regulation 2 of Annex V of MARPOL 73/78.

217 Regulation 2 of Annex V of MARPOL 73/78; Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 501.

218 Regulation 37.1 of Annex I of MARPOL 73/78. Subject to the guidelines provided in Regulation 37.2 of Annex I.

219 Regulation 17 of Annex II of MARPOL 73/78.

220 Regulation 17 of Annex I of MARPOL 73/78 for Oil Record Book Part I; Regulation 36 of Annex I of MARPOL 73/78 for Oil Record Book Part II.

221 Regulation 15 of Annex II of MARPOL 73/78.

222 Regulation 9 of Annex IV of MARPOL 73/78.

223 Guidelines for the Development of Garbage Management Plans adopted by the IMO by Resolution MEPC.71(38). See International Maritime Organization, *MARPOL Consolidated Edition* (IMO, 2006) page 323.

Regardless of the method of disposal of cargo and garbage from vessels, all operations must be recorded in the vessel's record books onboard.²²⁴ The record books must capture all related pollution prevention efforts aboard the vessel, including the ballasting and cleaning of fuel tanks, the discharge of dirty ballast or cleaning water from fuel tanks, as well as the collection and disposal of residues. The crew onboard vessels are required to record the disposal of bilge water that has accumulated in machinery spaces, the bunkering of fuel and lubricating oil, fuel transfers within the vessel, accidental oily water discharges into the environment, the discharge of noxious liquid substances, the discharge of garbage from vessels and the failure of any pollution prevention equipment.²²⁵ Furthermore, cargo record books must document results of tests conducted in order to ascertain the quality of fuel delivered to the vessel in line with Annex VI of MARPOL 73/78.²²⁶

Cargo record books can be inspected by the authorities of any State which is a party to MARPOL 73/78.²²⁷ During an inspection, the relevant authorities will review all records relating to the movement of cargo during the vessel's voyage.²²⁸ Irregular entries or an absence of entries in cargo record books may indicate that the vessel's pollution prevention equipment is not being used properly, and that a potential violation of the discharge provisions of MARPOL 73/78 has occurred.²²⁹ This information can be used for a variety of port State actions, including detaining the vessel until corrective action is taken to rectify the problem, and possibly even issuing civil or administrative penalties for violations.²³⁰ In serious cases involving the falsification of information in cargo record books, or the intentional discharge of pollutants in excess of the allowable limits provided by MARPOL 73/78, the master and owner of the

224 David O'Connell, Port State Control: International cooperation on marine pollution enforcement (2009) U.S. Coast Guard Office of Maritime and International law <http://www.uscg.mil/proceedings/summer2009/articles/58_O'Connell_Port%20State%20Control.pdf> at 24 March 2020 page 59.

225 Ibid page 60.

226 Regulation 18 of Annex VI of MARPOL 73/78.

227 Regulation 20 of Annex I of MARPOL 73/78; Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) Indiana Journal of Global Legal Studies 489 at 499; Cargo record books are regularly examined by port States. David O'Connell, Port State Control: International cooperation on marine pollution enforcement (2009) U.S. Coast Guard Office of Maritime and International law <http://www.uscg.mil/proceedings/summer2009/articles/58_O'Connell_Port%20State%20Control.pdf> at 24 March 2020 page 60.

228 Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) Indiana Journal of Global Legal Studies 489 at 501.

229 David O'Connell, Port State Control: International cooperation on marine pollution enforcement (2009) U.S. Coast Guard Office of Maritime and International law <http://www.uscg.mil/proceedings/summer2009/articles/58_O'Connell_Port%20State%20Control.pdf> at 24 March 2020 page 60.

230 Ibid.

vessel may be liable for criminal prosecution.²³¹

3.1.5 The Obligation of Flag States to Ensure that Harmful Substances are Appropriately Packaged, Labelled and Stowed Onboard Vessels

Where a vessel is carrying harmful substances, flag States must ensure that the crew onboard the vessel appropriately package, label and stow the substances,²³² as well as requiring the crew to carry documentation²³³ in accordance with applicable technical codes.²³⁴ The basic obligation in this regard is to minimise hazard to the marine environment²³⁵ and limit the carriage of harmful substances in consideration of the capacity of the vessel.²³⁶

Examples of technical codes adopted by the IMO to reduce pollution from harmful substances carried onboard vessels include the International Maritime Dangerous Goods Code (IMDG Code),²³⁷ the Code of Safe Practice for Solid Bulk Cargoes (1965), the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (1971), the Code of Safety for Nuclear Merchant Ships (1981); the International Gas Carrier Code (1983) and the International Bulk Chemicals Code (1983).²³⁸

These technical codes are generally intended to supplement or assist the implementation of relevant multilateral conventions. For example, the IMDG Code and the International Bulk Chemicals Code supplement the implementation of Annexes II and III of MARPOL 73/78 respectively. Furthermore, the IMDG Code supplements the implementation of SOLAS 74.²³⁹

Of the technical codes referred to above, the IMDG Code is the most significant in regulating harmful substances carried onboard vessels. The IMDG Code

231 Ibid.

232 Regulation 3 of Annex III of MARPOL 73/78.

233 Regulation 4 of Annex III of MARPOL 73/78.

234 International Maritime Organization, Global and Uniform Implementation of the Harmonized System of Survey and Certification (HSSC) (2000) <http://www.imo.org/includes/blastDataOnly.asp/data_id%3D22906/A883%2821%29.pdf> at 23 January 2020.

235 Regulation 2 of Annex III of MARPOL 73/78.

236 Regulations 5 and 6 of Annex III of MARPOL 73/78.

237 The IMDG Code was adopted by IMO Resolution A.716(17). Sonia Zaide Pritchard, *Oil Pollution Control* (Croom Helm, 1987).

238 Julian Roberts and Martin Tsamenyi, 'International Legal Options for the Control of Biofouling on International Vessels' (2008) 32 *Marine Policy* 559.

239 Ibid.

provides detailed guidelines on the packaging, labelling and stowage of dangerous substances to reduce the risk of pollution resulting from the carriage of these substances by vessels.²⁴⁰

3.1.6 The Obligation of Flag States to Investigate Reports by Other States of Non-compliance by Vessels

The sixth and final major enforcement obligation of flag States for the protection and preservation of the marine environment from vessel source pollution is the obligation to investigate reports on non-compliance by vessels under their registry by other States.²⁴¹

The formal reporting of a vessel's non-compliance by other States to the flag State gives rise to an allegation.²⁴² Once a flag State has received a report or is shown evidence that one of its vessels has violated a requirement under MARPOL 73/78, the flag State must investigate the report of the alleged violation.²⁴³ The flag State may request further or better evidence be presented to enable proceedings to be brought against the vessel for the alleged violation.²⁴⁴ The flag State must cooperate in the conduct of the investigation,²⁴⁵ particularly where cooperation could be useful in clarifying the circumstances of the case²⁴⁶ - for example, where the flag State vessel has caused loss of life or injury to nationals of another State or damage to the marine environment.²⁴⁷

While the flag State must cooperate in discerning all the details of the vessel's alleged non-compliance, the reporting State must endeavour to meet the

240 R Churchill and A.V. Lowe, *The Law of the Sea* (Manchester University Press, 3rd ed 1999) page 342.

241 Regulation 1 of Annex VI of MARPOL 73/78; Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 501.

242 D. Konig, *Flag of Ships* (Heidelberg and Oxford University Press, 2010) pages 13-14; The right to report instances of non-compliance by vessels is provided in Regulation 3 of Annex VI of MARPOL 73/78. Under this regulation if a State has evidence of a MARPOL 73/78 violation, it must provide such evidence to the flag State responsible for the non-complying vessel; For reporting guidelines see Yoshifumi Tanaka, 'Reflections on Reporting Systems in Treaties Concerning the Protection of Marine Environment' (2009) 42(2) *Ocean Development & International Law* 146 at 151.

243 Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 501.

244 International Maritime Organization, *MARPOL- How to do it* (IMO, 2002) page 20.

245 Article 94(7) of the LOS Convention; The need for cooperation in instituting proceedings is also provided for in Articles 27(1)(c) and 217(6) of the LOS Convention.

246 Article 217(5) of the LOS Convention.

247 Articles 94(7) and 217(4) of the LOS Convention.

appropriate requests of the flag State.²⁴⁸ If the investigation results in the discovery of sufficient evidence against the non-compliant vessel, the flag State must initiate legal proceedings against the vessel as soon as possible in accordance with the flag State's national laws.²⁴⁹ MARPOL 73/78 and the LOS Convention provide the basis for this jurisdiction.²⁵⁰ If the legal proceedings result in a conviction, the penalty imposed for the violation must be proportionate to the severity of the violation,²⁵¹ with the flag State promptly informing the State which reported the violation of the penalty imposed and any further action being taken.²⁵²

As this section has shown, international law provides extensive jurisdiction for flag States to enforce international rules and standards over vessels under their registry for the protection and preservation of the marine environment. However, the application and interpretation of this enforcement jurisdiction varies among flag States. The primary reason for this is that flag States possess a considerable amount of flexibility in interpreting applicable international laws.²⁵³

3.2 The Implementation of Flag State Enforcement Jurisdiction by The Maldives

This section analyses the implementation of flag State enforcement jurisdiction for the protection and preservation of the marine environment from vessel source pollution under the national laws of Maldives. Flag State enforcement jurisdiction under the national laws of Maldives will be analysed according to the six criteria that were used for international laws above. They are: (i) the flag State obligation to regulate discharge of pollutants into the marine

248 Article 217(5) of the LOS Convention.

249 Article 7 of MARPOL 73/78 states that "All possible efforts shall be made to avoid a ship being unduly detained or delayed..." and "when a ship is unduly detained or delayed... it shall be entitled to compensation for any loss or damage suffered"; Sahatjian and Joseph have stated that the United States has been particularly aggressive in seeking compensation for the detention of their vessels. L.C. Sahatjian and D.E. Joseph, 'MARPOL - An Adequate Regime?: A Questioning Look at Port and Coastal State Enforcement' (Paper presented at the International Oil Spill Conference, Washington, 1998).

250 Articles 4 to 6 of MARPOL 73/78; Article 94(4) of the LOS Convention states that, upon receiving a report of non-compliance, the flag State is required to investigate the matter and, if appropriate, take any action necessary to remedy the situation.

251 Article 4 of Annex IV of MARPOL 73/78 and Article 217(8) of the LOS Convention.

252 Article 4 of Annex IV of MARPOL 73/78; Andrew Griffin, 'MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?' (1994) 1(2) *Indiana Journal of Global Legal Studies* 489 at 501.

253 Henrik Ringbom, *Competing Norms in the Law of Marine Environmental Protection* (Kluwer Law International, 1997) page 2.

environment; (ii) the flag State obligation to detect unlawful discharges from vessels; (iii) the flag State obligation to conduct surveys to ensure that vessels comply with national laws and international conventions on pollution prevention; (iv) the flag State obligation to issue shipboard documentation and prevent non-compliant vessels from sailing; (v) the obligation to regulate packaging, labelling and stowage of pollutants onboard vessels; and (vi) the flag State obligation to investigate reports by other States of non-compliance by vessels.

3.2.1 The Obligation to Regulate Discharge of Pollutants into the Marine Environment

As demonstrated in Section 5.1 of this article, the Maldives (as a flag State) is required under the LOS Convention to implement measures to minimise, to the fullest possible extent, the release or discharge of toxic, harmful or noxious substances from vessels.²⁵⁴ Furthermore, the Annexes of MARPOL 73/78 oblige flag States to implement measures to prohibit the discharge into the marine environment of oil, noxious liquid substances carried in bulk, dangerous goods carried in packaged form, sewage, garbage and harmful substances through vessel exhausts²⁵⁵ in excess of the maximum allowable technical limits prescribed under the convention.

Under Articles 7 and 8 of the *Environment Protection and Preservation Act* 1993, the Maldives must prohibit the disposal of any type of hazardous substance or poisonous gas that may have harmful effects on the environment within the territory of the Maldives.²⁵⁶ The only situation in which hazardous substances may be discharged or emitted is if such a discharge becomes “absolutely necessary”.²⁵⁷ Unfortunately, the Act neither provides maximum allowable limits for the disposal of pollutants nor the method for their disposal²⁵⁸ into the marine environment under the normal operations of vessels. This is also the case for pollutants that are discharged for the purpose of combating specific pollution incidents in order to minimise damage to the marine environment.²⁵⁹ The Act is also silent on the thresholds within which substances may be disposed, such as distance from land, nature and concentration of effluents

254 Article 194(3) of the LOS Convention.

255 See analysis of vessel discharge limits prescribed in MARPOL 73/78 under Section 5.1.

256 Articles 7(a) and 8 of the Environment Protection and Preservation Act 1993.

257 Articles 7(b) and 8 of the Environment Protection and Preservation Act 1993.

258 For example, noxious liquid substances are to be discharged below the water line through an underwater outlet. See Regulation 13.2.1.2 of Annex II of MARPOL 73/78, discussed under Section 5.1.

259 As required under Regulation 4.3 of Annex I of MARPOL 73/78.

and the depth of the sea at the place of discharge.

Furthermore, the Act does not stipulate provisions for the adoption of technology to reduce the disposal of pollutants into the marine environment, or the role of shore reception facilities as points of disposal (as required under applicable international conventions). Indeed, the only requirement under *Environment Protection and Preservation Act* is for the Maldives to prohibit the disposal of any hazardous substance or poisonous gas that may have harmful effects on the environment.²⁶⁰

Conversely, it can be argued that the *Environment Protection and Preservation Act* restricts the discharge of any substance that may harm the environment, and therefore goes beyond the generally accepted discharge levels permitted under applicable international laws. For example, according to Regulation 15.2.3 of Annex I of MARPOL 73/78, a vessel is permitted to discharge oil at a rate of 15 parts per million while the vessel is *en route*. However, the discharge of substances such as oil, noxious liquid substances, packaged goods, sewage, garbage and harmful substances from vessel exhausts- even at levels generally accepted at the international level - is illegal under the national laws of Maldives.²⁶¹ Based on the analysis above, it can be argued that the *Environment Protection and Preservation Act* falls short of implementing the flag State enforcement obligation to regulate the discharge of pollutants from vessels in accordance with the LOS Convention and MARPOL 73/78.

The *Draft Environment Protection Act*, when enacted, will provide the basis for the Maldives to meet its obligations under applicable international laws. Under Articles 6(g) and 29(2)(1) of the *Draft Environment Protection Act*, the Maldives has the power to identify and undertake appropriate measures necessary for the national implementation of international conventions and agreements on environmental protection.²⁶² Like the *Environment Protection and Preservation Act*, the *Draft Environment Protection Act* imposes a general obligation on the Maldives to develop mechanisms to enforce national policies and standards²⁶³ in order to minimise the disposal of waste generated by activities in a manner that will not cause damage to the environment of Maldives.²⁶⁴ The *Draft Environment Protection Act* also imposes a total ban on the disposal of any hazardous or polluting substance into the country's marine environment

260 Articles 7 and 8 of the Environment Protection and Preservation Act 1993.

261 Based on Articles 7(b), 8 and 11(e) of the Environment Protection and Preservation Act 1993.

262 Articles 6(g) and 29(2)(1) of the Draft Environment Protection Act.

263 Article 6 of the Draft Environment Protection Act.

264 Article 20(a) of the Draft Environment Protection Act.

without the express authorisation of the government.²⁶⁵

In relation to the prevention of air pollution, the *Draft Environment Protection Act* provides the Maldives with the right to declare air pollution control areas and take precautionary measures to avoid air pollution in such areas.²⁶⁶ The flag State may prescribe and exercise control over the use of any fuel onboard vessels under its registry that may cause or is likely to cause air pollution,²⁶⁷ as well as prohibit the burning of any material not being fuel in an air pollution control area.²⁶⁸ It is also an offence under the draft Act to discharge harmful substances and waste into the marine environment, or emit harmful substances into the atmosphere in contravention of applicable laws and guidelines developed by the Maldives.²⁶⁹

Apart from the general obligation to minimise waste disposal, the obligations relating to the disposal of hazardous substances and the reduction of air pollution, the *Draft Environment Protection Act* does not provide any specific obligations for the Maldives to regulate the discharge of pollutants into the marine environment as provided under the LOS Convention and MARPOL 73/78. Therefore, it can be argued that the *Draft Environment Protection Act* also falls short of implementing flag State enforcement obligations to regulate the discharge of pollutants from vessels as stipulated under international law.

Furthermore, none of the other applicable national laws of Maldives provide obligations regulating the discharge of pollutants into the marine environment, other than the obligation for vessels navigating in the maritime zones of Maldives to implement measures to minimise the leakage of pollutants into the maritime environment under the *Draft Navigation Act*.²⁷⁰

3.2.2 The Obligation to Detect Unlawful Discharges from Vessels

As discussed in Section 5.1, the Maldives (as a flag State) has the obligation to detect unlawful discharges from vessels and ensure that vessels under its registry are equipped with systems that can monitor and control discharges from vessels. The monitoring systems onboard vessels are to continuously

265 Article 16(d) of the Draft Environment Protection Act.

266 Article 17(b) of the Draft Environment Protection Act.

267 Article 17(f-1) of the Draft Environment Protection Act.

268 Article 17(f-2) of the Draft Environment Protection Act.

269 Articles 22(c) and 33 of the Draft Environment Protection Act.

270 Article 60 of the Draft Navigation Act.

record the discharge in litres per nautical mile, the total quantity discharged, the content of pollutants discharged and the rate of discharge.²⁷¹

These records are to be maintained for at least three years.²⁷² The national laws of Maldives are silent on the obligation to detect unlawful discharges from vessels, the obligation to ensure that vessels are equipped with systems that can monitor and record discharges from vessels, as well as the obligation to maintain records of discharges from vessels for a fixed period of time.

3.2.3 The Obligation to Conduct Surveys to Ensure that Vessels Comply with National Laws and International Conventions on Pollution Prevention

We have seen that under MARPOL 73/78 the Maldives, as a flag State, must conduct surveys to ensure that vessels flying its flag or of its registry comply with applicable international rules and standards for the prevention, reduction and control of vessel source pollution.²⁷³ The purpose of flag State surveys is to verify that vessels under a State's registry are in compliance or fully conversant with the applicable international regulations on crewing standards and conduction of the vessels.

Presidential Decree No.138/2009/35 and the *Draft Navigation Act* obligate the Maldives to conduct flag State control surveys to ensure that vessels comply with national laws and international conventions on pollution prevention.²⁷⁴ The surveys are to be conducted by qualified officers under the authority of a principal surveyor appointed by the Ministry of Transport of Maldives.²⁷⁵ The *Draft Navigation Act* grants power to the Ministry to nominate external organisations, such as vessel classification agencies, to conduct surveys onboard vessels registered in the Maldives.²⁷⁶ The flag State of Maldives conducted approximately 1200 surveys per year to verify that vessels entitled to fly its flag were complying with generally accepted international rules and standards.²⁷⁷ All flag State surveys were conducted by State surveyors and not outsourced to

271 Regulation 15(3)(a) of Annex I of MARPOL 73/78.

272 Regulation 15(3)(a) of Annex I of MARPOL 73/78.

273 Article 217(1) of the LOS Convention.

274 Article 44 of Presidential Decree No.138/2009/35; Article 1 of the Draft Navigation Act provides the obligation to conduct flag State control surveys to ensure that vessels comply with national laws and international conventions on pollution prevention.

275 Article 4.1 of the Draft Navigation Act.

276 Article 4.1 of the Draft Navigation Act.

277 Information provided by the Ministry of Transport in Maldives.

classification agencies.²⁷⁸

The *Draft Environment Protection Act* also enables the Maldives to duly appoint qualified surveyors to conduct surveys.²⁷⁹ The surveyors have the power to require the production of licenses, registries, records and other documents relating to national laws and international conventions on environmental protection, as well as the power to inspect, examine and copy such documents.²⁸⁰ Furthermore, surveyors have the power to seize assets used in the commission of an offence²⁸¹ in order to make examinations and enquiries as to whether applicable laws and international conventions have been complied with,²⁸² and to arrest any vessel reasonably suspected of having caused serious damage to the marine environment.²⁸³

To ensure compliance with the *Draft Environment Protection Act*, a range of offences are prescribed under the Draft Act. It is an offence to hinder or obstruct a surveyor in the exercise of his duties,²⁸⁴ and to fail to comply with a lawful order or requirement made by a surveyor.²⁸⁵ Furthermore, failing or neglecting to carry out an improvement order issued by a surveyor is an offence under the Draft Act,²⁸⁶ so too the giving of misleading or wrongful information.²⁸⁷ The State has jurisdiction “to take measures deemed necessary”²⁸⁸ to protect the marine environment from incidents that have caused or threaten to cause pollution due to violations of the *Draft Environment Protection Act*. The measures taken by the State may include the levying of penalties by way of fines, as well as imprisonment of the responsible crew onboard the vessel that has committed the offence under the Draft Act.²⁸⁹

278 Information provided by the Ministry of Transport of Maldives.

279 Article 27(a) of the Draft Environment Protection Act. Article 27(a) refers to qualified personnel, in this regard, as environment inspectors. Environment inspectors have similar functions to surveyors. Therefore, for the purpose of this article, environment inspectors are referred to as surveyors.

280 Article 27(b-2) of the Draft Environment Protection Act.

281 Article 27(b-4) of the Draft Environment Protection Act.

282 Article 27(b-1) of the Draft Environment Protection Act.

283 Under Article 24(c) of the Draft Environment Protection Act.

284 Article 30(a) of the Draft Environment Protection Act.

285 Article 30(b) of the Draft Environment Protection Act.

286 Article 30(e) of the Draft Environment Protection Act.

287 Article 30(d) of the Draft Environment Protection Act.

288 Article 37(a) of the Draft Environment Protection Act.

289 Article 37(b) of the Draft Environment Protection Act.

3.2.4 The Obligation to Issue Shipboard Documentation and Prevent Non-compliant Vessels from Sailing

The requirement of the flag State to issue and endorse shipboard documentation such as certificates, cargo record books and emergency plans is a fundamental obligation under MARPOL 73/78.²⁹⁰ Moreover, the onboard documentation must be in conformity with the actual condition of the vessel.²⁹¹

Vessels navigating within the maritime zones of Maldives must carry documentation onboard to verify that they are in compliance with international rules and standards for the protection and preservation of the marine environment.²⁹² Foreign vessels navigating within the maritime zones of Maldives must also carry appropriate documentation onboard issued by their respective flag State or an organisation authorised to issue documentation of behalf of their respective flag State. Vessels registered in the Maldives are required to carry documentation issued pursuant to surveys conducted by qualified surveyors appointment by the Maldives.²⁹³

There are no domestic laws requiring Maldives to prohibit vessels that fail to comply with applicable rules, or that present an unreasonable threat to the marine environment, from sailing. However, these obligations are provided for in Articles 217(2) and (3) of the LOS Convention.²⁹⁴

3.2.5 The Obligation to Regulate Packaging, Labelling and Stowage of Pollutants Onboard Vessels

As shown in Section 5.1.5 above, MARPOL 73/78 requires the crew onboard vessels that carry any harmful substances to appropriately package, label and stow such substances,²⁹⁵ as well as carry the requisite documentation²⁹⁶ in accordance with applicable technical codes. The rationale underpinning this obligation is to minimise hazard to the marine environment²⁹⁷ and limit the

290 Regulations 7.1 and 7.2 of Annex I of MARPOL 73/78; Regulation 9 of Annex II of MARPOL 73/78; Regulations 5 and 6 of Annex IV of MARPOL 73/78; Regulations 6, 7 and 8 of Annex VI of MARPOL 73/78.

291 Article 217(3) of the LOS Convention.

292 Articles 21 and 53 of the Draft Navigation Act.

293 Article 4.1 of the Draft Navigation Act.

294 See Section 5.1.

295 Regulation 3 of Annex III of MARPOL 73/78.

296 Regulation 4 of Annex III of MARPOL 73/78.

297 Regulation 2 of Annex III of MARPOL 73/78.

carriage of harmful substances in consideration of the capacity of the vessel.²⁹⁸ There is currently no law in the Maldives that imposes obligations of this nature.

3.2.6 The Obligation to Investigate Reports by Other States on Non-compliance by Vessels

As a flag State, the Maldives is required to investigate reports on non-compliance by vessels under its registry by other States.²⁹⁹ The Maldives must cooperate in the conduct of the investigation³⁰⁰ and ask for further or better information to enable proceedings to be brought against non-compliant vessels for alleged violations.³⁰¹

There is no law in the Maldives dealing with the obligation to investigate reports of non-compliance by vessels registered to fly the flag of Maldives by other States. The *Draft Environment Protection Act*³⁰² and the *Draft Navigation Act*³⁰³ impose a requirement on vessels to report maritime incidents to the relevant government agency if the incident poses an imminent risk of serious pollution within the maritime zones of Maldives.³⁰⁴ However, none of the applicable national laws of Maldives impose requirements on the flag State to investigate reports made to the government, including reports submitted by other States. Furthermore, the national laws do not impose requirements on Maldives to cooperate in the conduct of an investigation, or to institute proceedings against a non-compliant vessel as required under applicable international conventions.

4 CONCLUSION

The LOS Convention and MARPOL 73/78 require contracting States to exercise jurisdiction for the protection and preservation of the marine environment from vessel source pollution. Based on the gaps that exist in the national laws of Maldives, it can be concluded that the national laws fall short of implementing the flag State prescriptive and enforcement jurisdiction under international laws for the protection and preservation of the marine environment from vessel source pollution.

298 Regulations 5 and 6 of Annex III of MARPOL 73/78.

299 Regulation 1 of Annex VI of MARPOL 73/78.

300 Article 94(7) of the LOS Convention.

301 International Maritime Organization, MARPOL- How to do it (IMO, 2002) page 20.

302 Article 24 (a-1) of the Draft Environment Protection Act.

303 Article 60 of the Draft Navigation Act.

304 Article 24(a-2) of the Draft Environment Protection Act.

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