16

Marine pollution law

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Marine pollution, when and where it occurs, can have disastrous results. It poses a significant and continuing threat to the world's oceans, contributing to environmental degradation of marine areas, depletion of species and damage to the entire ocean ecosystem. This chapter explores the international environmental law relating to marine pollution focusing upon incidental and unintentional discharges from ships as well as the dumping of waste at sea. It will also consider the current governance gaps, emerging challenges and the future of regulation in this area.

Introduction

One learned writer has commented: 'Protection and preservation of the environment are prominent in current world issues.'[1] However, as he also added, concerns 'relating to the marine environment are probably some of the most prominent and most complex'.[2] Marine pollution, when and where it occurs, can have disastrous results – not only for the marine environment itself but also for those dependent on marine resources for food and livelihoods. Indeed, it has been contended that 'it is the sea we must look to if we are to find the resources to feed the rapidly increasing population of the world'.[3]

The marine environment can become polluted via a number of different means including land-based and seabed activities, the deliberate dumping of waste, incidental operational discharges from vessels and installations, and the accidental or unintentional release of oil and other substances from ships. It is perhaps the last of these that has drawn the most public attention and triggered international responses.

Reference need only be made in this regard to the *Exxon Valdez* incident in March 1989. In a pristine marine environment the vessel ran aground and spilled over 40,000 tons (or 10

★ The authors are grateful to Emeritus Professor Zada Lipman for comments she provided on an earlier version of this chapter.

1 M.W.D. White, *Australian Marine Pollution Laws*, 2nd edition, Annandale: Federation Press, 2007, p. 1.

2 Ibid.

3 J. Nicholson, *Food from the Sea*, London: Cassell, 1979, p. 1.

million gallons) of crude oil which then spread around the sea and shores.[4] The damage to the environment was extensive and the consequences of that damage are still being felt to the present day. Local communities were devastated by the initial spill and the trauma of the ensuing litigation which followed. This disaster was not isolated and there are other incidents of note including the 1967 *Torrey Canyon* and the 1978 *Amoco Cadiz* accidents. Later there was the Liberian-registered vessel, *The Braer*, which in 1993 spilled its cargo on the shores of the Shetland Islands.[5] After this there was the grounding of *The Sea Empress* at St Ann's Head, Milford Haven, in 1996, and the *Prestige* off the Spanish coast in 2002.[6]

The international community has responded in several ways, including the adoption of a number of conventions. The focus in this chapter will be upon four significant conventions on the subject, which are the *International Convention on Civil Liability for Oil Pollution Damage* 1969 as amended by the 1992 Protocol (CLC);[7] the *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* 1972 and 1996 Protocol (London Convention);[8] the *International Convention for the Prevention of Pollution from Ships* 1973 as amended by the 1978 Protocol (MARPOL);[9] and the *International Convention on Salvage* 1989 (Salvage Convention).[10] In between MARPOL and the Salvage Convention a fifth instrument also needs to be included: the United Nations Convention on the Law of the Sea 1982 (UNCLOS). For, as one author says, the 'protection of the marine environment is the subject of a large part of [this] Convention'.[11]

From time to time, however, there have also been other international treaties on the subject of marine pollution. There is, for example, the *International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties* 1969[12] and the *Convention on Oil Pollution Preparedness, Response and Co-operation* 1990,[13] which obliges state parties to adopt national regimes for rapid and effective response to oil pollution incidents. The *International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous*

4 I. Hunter, J. Salzman and D. Zaelke, *International Environmental Law and Policy*, 3rd edition, New York: Foundation Press, 2011, p. 796.
5 For a summary of the volume discharges from each incident see: Oil Spill Solutions, *Tanker Spills Show Declining Trend*. Online. Available HTTP: <www.oilspillsolutions.org/majorspills.htm> (accessed 29 February 2012).
6 For a summary of the history of incidents and responses see International Maritime Organization, *Background*. Online. Available HTTP: <http://www.imo.org/OurWork/Environment/PollutionPrevention/OilPollution/Pages/Background.aspx#2> (accessed 29 February 2012).
7 *International Convention on Civil Liability for Oil Pollution Damage*, opened for signature 29 November 1969, 973 UNTS 3 (entered into force 19 June 1975).
8 Also known as the London Dumping Convention until 1992: *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter*, opened for signature 29 December 1972, 1046 UNTS 120 (entered into force 15 July 1977).
9 The *International Convention for the Prevention of Pollution from Ships* (1973) and the 1978 *Protocol* are read as a single instrument MARPOL, opened for signature 17 February 1978, 17 ILM 246 (entered into force 2 October 1983).
10 *International Convention on Salvage*, opened for signature 1 July 1989, 1996 UNTS 194 (entered into force 28 April 1989).
11 I. Shearer, 'Current Law of the Sea Issues', in R. Babbage and S. Bateman, *Maritime Change: Issues for Asia*, St Leonards: Allen & Unwin, 1993, p. 61.
12 *International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties*, opened for signature 29 November 1969, 9 ILM 25 (entered into force 6 May 1975).
13 *Convention on Oil Pollution Preparedness, Response and Co-operation*, opened for signature 30 November 1990, 30 ILM 733 (entered into force 13 May 1995).

and Noxious Substances by Sea 1996, together with a 2010 Protocol,[14] covers not only pollution damage but also the risks of fire and explosion, including loss of life or personal injury and loss of or damage to property. Another example is the *International Convention on Civil Liability for Bunker Oil Pollution Damage* 2001 (Bunkers Convention),[15] which relates to oil spills from ships that are not oil tankers. In addition, there are other treaties which contribute to the protection of the marine environment; for example those governing seabed activities[16] and the environmentally sound deconstruction of ships.[17]

The International Maritime Organization (IMO) is the principal United Nations agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships.[18] Relevantly, it has established a technical group on marine pollution: the Marine Environmental Protection Committee. It is responsible for many marine pollution treaties including MARPOL and the London Convention,[19] as well as the more recent *Convention on Anti-Fouling Systems* 2001 and the *Ballast Water Convention* 2004, which seek to prevent damage to marine species and the spread of alien species respectively.[20] It has also been influential in the development of important 'soft-law' codes and guidelines that protect the marine environment.[21]

International marine pollution law is thus a complex field which involves a considerable body of law.[22] This chapter, however, will focus upon the five key instruments outlined above. Each of these conventions contributes to securing the marine environment by dealing with marine pollution in a variety of ways. The chapter will explore the major provisions and developments as well as the challenges for the future.

14 *International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea*, opened for signature 3 May 1996, 25 ILM 1406 (not yet in force).

15 *International Convention on Civil Liability for Bunker Oil Pollution Damage*, opened for signature 1 October 2001, 40 ILM 1493 (entered into force 21 November 2008).

16 Article 208 of UNCLOS provides that coastal states shall regulate to prevent, reduce and control pollution from seabed activities within areas of national jurisdiction. Beyond areas of national jurisdiction seabed activities are governed by the International Seabed Authority under Part XI of the UN Convention on the Law of the Sea and the *Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea*. For a summary see P. Sands, *Principles of International Environmental Law*, 2nd edition, Cambridge: Cambridge University Press, 2003, pp. 445–8.

17 For further discussion of the recent *Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships* see Chapter 17 by T.G. Puthucherril in this volume. See also Y-C. Chang, N. Wang & O.S. Durak 'Ship Recycling and Marine Pollution' *Marine Pollution Bulletin*, 60, 2010, 1390–6; and Md S. Karim, 'Environmental Pollution from Shipbreaking Industry: International Law and National Legal Response' *Georgetown International Environmental Law Review*, 22, 2010, 185–240.

18 International Maritime Organization. Online. Available HTTP: <www.imo.org> (accessed 29 February 2012). The IMO was created in 1958 and is based in London.

19 International Maritime Organization, *List of IMO Conventions*. Online. Available HTTP: <http://www.imo.org/About/Conventions/ListOfConventions/Pages/Default.aspx> (accessed 29 February 2012).

20 *Convention on Control of Harmful Anti-Fouling Systems on Ships* (2001) and the *Convention for the Control and Management of Ships' Ballast Water* (2004).

21 For example the *Guidelines to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens Through Ballast Water* and *Guidelines on the control and manage of ships' biofouling to minimize the transfer of invasive aquatic species*.

22 For a useful summary of the status of all the IMO Conventions and the percentage of the world's shipping tonnage they cover see: International Maritime Organization, Status of Conventions. Online. Available HTTP: <www.imo.org/About/Conventions/StatusOfConventions/Pages/Default.aspx> (accessed 29 February 2012).

Key international marine pollution conventions

International Convention on Civil Liability for Oil Pollution Damage

The 1969 Convention 'was born of a consciousness of . . . the dangers of oil pollution inherent in the world-wide carriage of oil in bulk by sea'.[23] Also, *inter alia*, of a 'need to ensure that adequate compensation is available to persons who suffer damage caused by pollution resulting from the escape or discharge of oil from ships'.[24] The CLC recites that the states parties are conscious 'of the dangers of pollution posed by the worldwide maritime carriage of oil in bulk' and that they are convinced 'of the need to ensure that adequate compensation is available to persons who suffer damage caused by pollution resulting from the escape or discharge of oil from ships'.[25] To that end it sets up a scheme for those suffering such damage to be able to be compensated.

That scheme, however, was significantly altered by the 1992 Protocol, which amended key elements. A hardening of attitudes towards the menace of oil pollution is evident between 1969 and 1992 as considered in the following examples.

Pollution damage

The limited definition of 'pollution damage' in the CLC was amended in 1992 to include:

(a) loss or damage caused outside the ship by contamination resulting from the escape or discharge of oil from the ship, wherever such escape or discharge may occur, provided that compensation for impairment of the environment other than loss of profit from such impairment shall be limited to costs of reasonable measures of reinstatement actually undertaken or to be undertaken;
(b) the costs of preventive measures and further loss or damage caused by preventive measures.[26]

There is a clear emphasis in this definition on damage to or impairment of the environment which is not evident in the definition of the same expression in the 1969 Convention. Moreover, by virtue of the Protocol, the CLC is not confined to ships 'carrying oil' as it is sufficient that there be contamination resulting from the escape or discharge of oil from a 'ship'. But, as set out below, the ship must be one constructed or adapted for the carriage of oil in bulk as cargo.

Ship

By virtue of the Protocol a 'ship' is defined as:

> any sea-going vessel and any seaborne craft of any type whatsoever constructed or adapted for the carriage of oil in bulk as cargo, provided that a ship capable of carrying oil and other cargoes shall be regarded as a ship only when it is actually carrying oil in

23 C. Hill, *Maritime Law*, 4th edition, London: Lloyds of London Press Ltd, 1995, pp. 432.
24 Ibid., p. 433.
25 CLC, Preamble.
26 CLC Protocol, Art. 2(3).

> bulk as cargo and during any voyage following such carriage unless it is proved that it has no residues of such carriage of oil in bulk aboard.[27]

In contrast to the definition of 'ship' in the 1969 Convention,[28] a ship need no longer be one which is 'actually carrying oil in bulk as cargo'; it is sufficient if the vessel is one 'constructed or adapted for the carriage of oil in bulk as cargo'. The latter may not be one which is actually carrying oil in bulk as cargo at all, although it may be 'constructed or adapted' to do so. Of course, a ship capable of carrying oil and other cargoes is to be regarded as a ship so constructed or adapted only when it is 'actually' carrying oil in bulk. Escapes of oil from ships that are not oil tankers are dealt with in the Bunkers Convention, as noted above.

Oil

The word 'oil' is defined in the 1992 Protocol as 'any persistent hydrocarbon mineral oil such as crude oil, fuel oil, heavy diesel oil and lubricating oil, whether carried on board a ship as cargo or in the bunkers of such a ship'.[29] This is a wider definition than that contained in the 1969 Convention[30] in that the latter was limited to 'any persistent oil' whereas oil now extends to 'any persistent hydrocarbon mineral oil'. Widening the definition of 'oil' ensures broader coverage of the Convention.

Incident

An 'incident' is defined in the Protocol as 'any occurrence, or series of occurrences having the same origin, which causes pollution damage or creates a grave and imminent threat of causing such damage'.[31] The earlier definition of 'incident' in the 1969 Convention[32] contained no such reference to a 'grave and imminent' threat of damage. Yet inclusion of the threat of damage is clearly important. Furthermore, Article 5 of the Protocol replaces Article IV of the Convention, which now reads:

> When an incident involving two or more ships occurs and pollution damage results therefrom, the owners of all the ships concerned, unless exonerated under Article III, shall be jointly and severally liable for all such damage which is not reasonably separable.

Wherever such escape or discharge may occur

By the 1992 Protocol, the CLC applies:

(a) to pollution damage caused:
  (i) in the territory, including the territorial sea, of a . . . State, and
  (ii) in the exclusive economic zone of a . . . State, established in accordance with international law, or, if a . . . State has not established such a zone, in an area beyond and

27 CLC Protocol, Art. 2(1).
28 CLC, Art. 1(1).
29 CLC Protocol, Art. 2(2).
30 CLC, Art. 1(5).
31 CLC Protocol, Art. 2(4).
32 CLC, Art. 1(5).

> adjacent to the territorial sea of that State determined by that State in accordance with international law and extending not more than 200 nautical miles from the baseline from which the breadth of its territorial sea is measured;
> (b) to preventive measures, wherever taken, to prevent or minimize such damage.[33]

This gives the CLC a much wider application than it had in 1969 when it was stated to 'apply exclusively to pollution damage caused on the territory including the territorial sea of a . . . State and to preventive measures taken to prevent or minimize such damage'.[34] Confining pollution damage to that caused 'on' the territory of a State or in its territorial sea, meant that the CLC did not extend very far at all. As will be seen below, the exclusive economic zone is a much larger area than merely the territorial sea of a state. It is to be noted that preventive measures now qualify, 'wherever taken'.

Loss or damage

Pollution damage is 'loss or damage' as defined by Article 4(1), substituted by the Protocol, except as provided in Articles 4(2) and (3):

> the owner of a ship at the time of an incident, or, where the incident consists of a series of occurrences, at the time of the first such occurrence, shall be liable for any pollution damage caused by oil as a result of the incident.[35]

The intention is clearly for persons to be compensated for loss or damage brought about by a polluting incident. There are, however, several matters of importance which arise in this regard. First, by virtue of the 1992 Protocol,[36] liability is able to be limited by an owner to three million units of account for a ship not exceeding 5,000 units of tonnage and, for other ships, an additional 420 units of account – provided that, in all, the aggregate amount does not exceed 59.7 million units of account. The 'unit of account' is defined in other provisions of the Protocol.[37] This is a considerable advance, as it enhances the limitation of liability provisions in the 1969 Convention which were based on the French currency unit of the franc. So as to give effect to this limitation of liability, the owner is able to constitute a fund[38] for the total amount representing the limits of liability which is distributable among claimants in proportion to the amounts of their established claims.[39]

Some, of course, will be opposed to the notion of limitation of liability, and establishing a limitation fund, in principle. But it does work, particularly in the case of widespread damage, so as to enable all those suffering loss or damage to achieve some recovery. Without it, whoever was first in bringing a legal action could deprive all the others of any chance of compensation, a result which would be unconscionable.

33 CLC Protocol, Art. 3.
34 CLC, Art. 2.
35 See CLC Protocol, Art. 3.
36 CLC Protocol, Art. 6(1).
37 See CLC Protocol, Arts 9(a), (b) and (c).
38 CLC Protocol, Art. 6(2).
39 CLC, Art. 5(4).

Secondly, under the 1969 Convention[40] the ship owner was not entitled to limit liability if the incident occurred 'as a result of [that party's] actual fault or privity'. Now, by virtue of the 1992 Protocol, the owner is not entitled to limit liability 'if it is proved that the pollution damage resulted from his personal act or omission, committed with the intent to cause such damage, or recklessly and with knowledge that such damage would probably result'.[41] In other words, the situations in which a case of disentitlement to limit liability may arise have been broadened.

The third aspect is time limitations. Under Article VIII of the 1969 Convention, which is unchanged by the 1992 Protocol, all rights of compensation are lost 'unless an action is brought . . . within three years from the date when the damage occurred'. This seems unduly restrictive as the right to bring an action may not become clear until well after the three-year period. It is also provided, though, that 'in no case shall an action be brought after six years from the date of the incident which caused the damage'.[42] Once more, this seems overly restrictive – particularly in those cases where damage may be very widespread and continuing to occur, as was the case for example with the *Exxon Valdez*. In such cases, the damage may be continuing well beyond the six-year mark.

Under the 1969 Convention, and it is unchanged by the Protocol, an owner escapes liability upon proving that pollution damage resulted from 'a natural phenomenon of an exceptional inevitable and irresistible character'.[43] In some systems this is known as an 'act of God'. The question may be raised, however, of the exact operation of this exception. Severe weather, which was not anticipated, could fall within it. But why should that be so? At sea, severe weather of all magnitudes arguably should reasonably be expected at all times. Or, at least, it should never be ignored as a realistic possibility.

The compensation scheme created by the CLC, together with the *Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage* (1971),[44] as amended in 1992, is a critical component of international marine pollution law.[45]

MARPOL

The 1973 Convention recites that the parties are '[c]onscious of the need to preserve the human environment in general and the marine environment in particular'.[46] It is also recognised 'that deliberate, negligent or accidental release of oil and other harmful substances from ships constitutes a serious source of pollution'.[47] Accordingly, by Article 1(1), the parties undertake to give effect to the provisions of the Convention and its annexes in order to

40 CLC, Art. 5(2).
41 CLC Protocol, Art. 6(2).
42 CLC, Art. 8.
43 CLC, Art. 3(2)(a).
44 *Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage*, opened for signature 18 December 1971, 1110 UNTS 57 (entered into force 16 October 1978).
45 The 1971 Fund Convention ceased to be in force in 2002 and was replaced by the 1992 Protocol. The 1971 Fund continues to deal with incidents occurring before 2002. The 1992 Protocol was amended in 2000 to increase the levels of compensation and a further Protocol in 2003 created a Supplementary Fund adding a third tier of compensation: see *International Oil Pollution Compensation Funds*. Online. Available HTTP: <http://www.iopcfund.org/> (accessed 29 February 2012).
46 MARPOL, Preamble.
47 Ibid. MARPOL specifically excludes the dumping of waste, which is dealt with under the London Convention.

prevent the pollution of the marine environment by the discharge of harmful substances or effluents containing such substances.

As amended by 1978 Protocol, MARPOL is the most extensive of the marine pollution conventions relating to discharge of pollutants from ships. It includes discharge standards and technical specifications as well as navigation standards. It is also a treaty which has significant punitive aspects when given the force of law. The master, owner and other persons who cause environmental damage may be charged and the fines may be extensive. Even if a ship complies with the MARPOL requirements, the master and owner are still at risk of being charged under general environmental legislation of a state.[48]

Annex I: oil pollution

Annex I addresses the discharge of oil from ships and imposes a regime under which the discharge of oil overboard, during the normal operations of ships, is strictly controlled. It absorbs the provisions of the original OILPOL 54 (that is, the *International Convention for the Prevention of Pollution of the Sea by Oil*[49]) and extends them enormously. It comprises 37 regulations and several appendices. Regulation 1 and its Appendix 1 define the oils covered – which is practically the whole range but excludes those petrochemicals which come under Annex II. Regulation 1(10) defines 'nearest land' as points to seaward of the baseline from which the territorial sea is established.

From the legal point of view, it is worth highlighting several regulations. Regulation 11 gives the power to enforce port state control and, if the vessel does not comply with Annex I, to detain it until it does. Regulations 15 and 34 relate to the legal requirement about control of oil, and their key provisions are that 'any discharge into the sea of oil or oily mixtures from ships . . . shall be prohibited' unless the regulatory provisions are satisfied. These provisions relate to no discharge in 'special areas' and for other discharges the tanker must be more than 50 miles from the nearest land, proceeding *en route* and the discharge should not exceed 30 litres per nautical mile.[50] Regulation 1(11) defines special areas, which are areas that are particularly at risk and in which no discharges are allowable in the main.

Regulation 4 contains the exceptions to the application of Regulations 15 and 34, which are the defences in fact. These defences apply if the discharge was to secure the safety of the ship or to save life at sea or it resulted from damage to a ship or its equipment provided all reasonable precautions were taken afterwards to prevent or minimise it. This exception does not apply, however, 'if the owner or the master acted either with intent to cause damage, or recklessly and with knowledge that damage would probably result'; or it was approved by the administration to combat another discharge. Annex I applies to all ships by Regulation 2(1) and to fixed and floating drilling rigs, and Regulation 39 equates their responsibilities to non-tankers of 400 tonnes gross tonnage and above.

The rest of Annex I is concerned with details of ships' construction, equipment, record books, forms, calculations to meet these requirements and administrative details. In all it is a long and fairly complex document. Overall, Annex I has been very successful in reducing discharge of oil into the sea.

48 White, op. cit., p. 44. For what follows, as an outline of MARPOL's various Annexes, see pp. 45–9.
49 *Convention for the Prevention of Pollution of the Sea by Oil*, opened for signature 12 May 1954, 327 UNTS 3 (entered into force 26 July 1958).
50 There are a number of other provisions which cannot be set out in full here.

Annex II: noxious liquid substances

Annex II addresses the discharge or escape of noxious liquid substances from ships transporting them in bulk, which, in lay terms, could be described as bulk chemicals. This is an annex of growing importance as the tonnages of chemicals transported at sea are rising steadily and chemical tankers are now fairly common. Regulation 1(1) defines 'noxious liquid substance' in terms of a number of categories of the substances (X, Y and Z) and as listed in the International Bulk Chemical Code. 'Nearest land' is defined in similar terms to that in Annex I, as are 'Special Areas'.

It is Regulation 13 that has the enforcement provisions. They are complex and are divided into laws relating to the category of chemicals being carried, as in Appendix 1. There are parallels with the oil regime in Regulations 15 and 34 of Annex I, and, basically, the more toxic categories are prohibited from discharge into the sea unless below the toxic levels laid down. Regulation 3 has the exceptions (defences), which are the usual ones of securing safety of life or property, the discharge resulting from damage to a ship or its equipment or its being approved for combating pollution occurrences.[51] The rest of the lengthy Annex II is devoted to the administration of construction, discharges to facilities ashore, standards for procedures and arrangements and such like.

Annex III: harmful substances in packaged form

Annex III, the first of the optional annexes, addresses the carriage by sea of harmful substances in packaged form. The terms 'harmful substances' and 'packaged form' are both defined in the *International Maritime Dangerous Goods Code* (IMDG Code). States parties are obliged to issue regulations to prohibit the carriage of such substances other than in accordance with Annex III. The Annex sets out a framework for adequate packing, marking, labelling, documentation and stowage of such packages.[52] Basically, Annex III is concerned with bulk shipment of a wide range of substances that may be harmful if discharged into the sea. The Annex III regime also gives some notice to ships' crews and other cargo handlers of the nature of the cargo.

The enforcement provision is in Regulation 1(2), which provides that carriage of harmful substances is prohibited except in accordance with Annex II. The exceptions are in Regulation 7, and are that jettisoning is prohibited except to secure safety of the ship or life at sea, and that washing leaking chemicals overboard should be regulated except where it would impair the safety of the ship. Regulation 8 gives the power for port state control inspections and detention of the ship until it complies with the Regulations.

Annex III has not had a huge impact on shipping – unlike Annex I – but it is of some assistance. It has been more of a support for safety for ships and their crews. For example, a container with unknown and unmarked chemicals that starts to get hot and then to leak highly toxic waste is a major problem for a ship at sea. Any step to avoid or limit such incidents is welcomed by seafarers and all others involved in the transport of goods by sea.

Annex IV: sewage

Annex IV addresses the discharge of sewage from ships on international voyages and it was contentious because there was opposition to the provisions applying to fairly small vessels. As

51 These are the same exceptions as are in Regulation 4 in Annex I.
52 Regulations 1–6.

a result, Annex IV was delayed in achieving sufficient ratifications and it only came into force on 27 September 2003 and then only because some amendments were introduced. The concern was the regulation of what ships were to do with sewage when in restricted waters. For smaller ships it is problem enough, but for the modern large passenger cruise ships carrying thousands of passengers and crew when in ports and bays is a major problem.

The amendment (in Regulation 2(1)) increased the size of the ships to which Annex IV applied to 400 tonnes and above, or to ships below that tonnage certified to carry 15 or more passengers. Only ships engaged in international voyages are caught by it. Annex IV, in Regulation 11, prohibits discharge of sewage into the sea, except:

(a) at a distance of more than three nautical miles from nearest land for comminuted and disinfected sewage or 12 nautical miles for other sewage, provided the ship is under way at more than four knots and the rate of discharge is approved under International Maritime Organization (IMO) standards; or
(b) the ship has an approved sewage treatment plant meeting the operational requirements laid down by the IMO and no effluent is visible in the water; or
(c) the ship is in coastal state waters whose requirements are less stringent than those of Annex IV; or
(d) the discharge is to secure 'the safety of a ship and those onboard or saving life at sea' (Reg 3(1)); or
(e) the discharge results from damage to the ship or its equipment and reasonable precautions were taken before and after the discharge for the purpose of preventing or minimizing it (Reg 3(2)).

It is noted that, like Annexes I and V, the definition of 'nearest land' normally is the baseline of the coastal state, but for the north-east of Australia, for example, it is defined by a series of latitudes and longitudes. The purpose and effect is that the outer edge of the World Heritage listed Great Barrier Reef is the baseline of the land from which is measured the minimum stated distance for discharge of sewage to be permitted.

Under Annex IV by Regulation 12 states parties undertake to ensure provision of facilities at ports and terminals to receive sewage ashore without causing undue delay to the ship. The appendix relates to the relevant international sewage pollution certificate that ships have to carry for entry into port state control regimes.

Annex V: garbage

Annex V strictly regulates the discharge of garbage over the side of a vessel into the sea. It applies to all ships and to fixed or floating platforms. 'Garbage' is defined in Regulation 1(a) as 'all kinds of victual, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of a ship . . .' except those substances covered by other annexes. 'Nearest land' is defined in Regulation 1(2) in the same terms as Annex I, and 'special areas' are also the same as those in Annex I. The discharge of 'all plastics' is totally banned,[53] because they are persistent and not biodegradable, and that of other garbage is regulated so that it is not discharged close to shore. Discharge of dunnage and packing that floats

53 Regulation 3(1)(a).

is prohibited closer than 25 nautical miles offshore and of food wastes to three nautical miles, if comminuted, and otherwise it is 12 miles.[54]

The usual exceptions are provided, namely securing the safety of the ship and those on board, saving life at sea or damage to the ship provided reasonable precautions were taken before and after the discharge.[55] An exception not found in the other annexes is that accidental loss of synthetic fishing nets is a defence under Regulation 6(c) but, once again, all reasonable precautions must have been taken. The remainder of Annex V deals with such matters as shore reception facilities, port state control powers, record keeping and the 'Garbage Record Book'.

Annex VI: air pollution

Annex VI, which was not one of the initial five annexes to MARPOL, regulates air pollution from ships, primarily the composition of bunkers (fuel) and its combustion to ensure that fuel is used which results in restricted amounts of air pollution from the combustion gases. It only came into force on 19 May 2005. It is more detailed than Annexes III to V and, being more recently drafted, has incorporated some aspects not to be found in the earlier annexes.

Any deliberate emissions of ozone-depleting substances are prohibited by Regulation 12(2) unless they come within the provisions of the Regulations, which define and set out the parameters of the fuel that is allowable. Exceptions to this regime are when the emission is necessary for the safety of the ship, saving life at sea, or from a damaged ship when all reasonable precautions have been taken before and after with the exception where the owner or master acted either with intent or recklessly and with knowledge that damage would probably result.[56]

The remainder of the Regulations are concerned with surveys, certification, jurisdiction for port state control regimes and violations and enforcement. Sulphur and nitrogen oxides come in for special mention. Incineration onboard of fuels is regulated by Regulations 16 and 17; governments are to ensure reception facilities are available ashore and offshore platforms are also within the regime. The whole point of Annex VI is that if the quality of the fuel burned in ships is regulated, to restrict sulphur and other noxious chemicals in it, the atmosphere will be cleaner.

It is considered that MARPOL is an effective regime at least in part due to its obligatory technological standards, which have resulted in improvements in ship construction and design.[57]

London Convention[58]

As opposed to the above instruments, which deal with accidental discharges, the London Convention and its Protocol regulate the deliberate dumping of waste at sea.[59] The overall

54 Regulation 3(1)(b) and (c).
55 Regulation 6.
56 See Regulation 3.
57 E. Louka, *International Environmental Law: Fairness, Effectiveness, and World Order*, Cambridge: Cambridge University Press, 2006 p. 158.
58 The text of the Convention is online. Available HTTP: <www.imo.org/blast/blastData.asp?doc_id=7521&filename=LC1972.pdf> (accessed 29 February 2012).
59 For a summary of the provisions see Hunter et al., op. cit., pp. 823–7; Louka, op. cit., pp. 148–53; R. Lyster, Z. Lipman, N. Franklin, G. Wiffen and L. Pearson, *Environmental & Planning Law in New South Wales*, 3rd edition, Annandale: Federation Press, 2012, pp. 623–4.

objective of the regime is the prevention of 'pollution of the sea by the dumping of waste and other matter'.[60] It covers the territorial sea and high seas but not internal waters.[61]

Dumping

The Convention includes a wide definition of 'dumping': the 'deliberate disposal at sea' of 'wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea' or the disposal of those structures themselves.[62]

Waste is also defined broadly as 'material and substance of any kind, form or description'.[63] The Convention established three categories of waste and concomitant regulations on their dumping. Highly hazardous waste (listed in Annex I, known as the 'black list') was prohibited from being dumped, except in an emergency and after consultation with states that would be affected.[64] Annex II substances ('grey list') required prior 'special' permit before they could be dumped.[65] All other waste required a prior 'general' permit before it could be disposed of at sea.[66] There were exceptions in circumstances relating to the safety of human life and vessels and other emergency situations which pose an unacceptable risk to human health or where there is no other option.[67]

1996 Protocol

Later developments included a moratorium on the dumping of radioactive waste at sea and resolutions on further limitations on a range of other activities including the disposal of persistent plastics and synthetic materials, incineration at sea, dumping of industrial wastes and the application of the precautionary principle.[68] These developments led to the 1996 Protocol to the London Convention,[69] which updated and replaced the 1992 Convention. Essentially the Protocol strengthened the regime by prohibiting the dumping of all waste with the exception of substances listed in Annex 1.[70] Incineration of waste at sea is prohibited[71] and export of waste to other countries for dumping or incineration is also forbidden.[72]

60 London Convention, Art. I.
61 It originally made no mention of the EEZ, having been concluded prior to UNCLOS, but more recent amendments extended its scope in this regard: Louka, op. cit., p. 149. The 1996 Protocol refers to internal waters in Article 7.
62 London Convention, Art. III. But it does not include 'wastes or other matter incidental to, or derived from, the normal operations of' the above structures and equipment.
63 Ibid.
64 London Convention, Art. IV(1)(a).
65 London Convention, Art. IV(1)(b).
66 London Convention, Art. IV(1)(c).
67 London Convention, Art. V.
68 See Sands, op. cit., p. 419.
69 *Protocol to the Convention on the Prevention of Marie Pollution by Dumping of Wastes and Other Matter*, opened for signature 7 November 1996, 36 ILM 1 (entered into force 24 March 2006). The text of the Protocol is online. Available HTTP: <www.imo.org/blast/blastData.asp?doc_id=13203&filename=PROTOCOL%20Amended%202006.doc> (accessed 29 February 2012).
70 London Convention Protocol, Art. 4(1.1). Annex I substances include dredged material, sewage sludge, fish waste, man-made structures, inert inorganic geological material, natural organic material, bulk iron, concrete and similar material and carbon dioxide from processes for sequestration.
71 London Convention Protocol, Art. 5.
72 London Convention Protocol, Art. 6.

With respect to the Annex 1 substances, a permit is required before such substances can be dumped.[73] Parties are to designate a national authority to issue permits for disposal of Annex 1 substances, which is required in addition to keep records of permitted and actual dumping and monitor the condition of the sea.[74] Where possible, more environmentally sound disposal options should be identified, to avoid dumping.[75] In relation to the dumping of other substances a waste assessment procedure is provided in Annex 2.

It calls on the parties to work individually and collectively to 'prevent, reduce and . . . eliminate pollution caused by dumping or incineration at sea'.[76] The Protocol refers to enhancing regional cooperation,[77] encouraging technical cooperation and assistance[78] and promoting the Protocol through international organisations.[79] At the state level each party must report on waste loaded in its territory or onto one of its flagged vessels and the administrative and legislative measures taken to implement the Protocol, as well as their effectiveness.[80]

The Protocol incorporates a more precautionary approach by requiring the adoption of preventative measures where waste is likely to cause harm, 'even where there is no conclusive evidence to prove a causal relation between inputs and their effects'.[81] Exceptions include situations of *force majeure*, where there is a danger to human life or a real threat to vessels.[82] The Protocol also incorporates the polluter pays principle in Article 3, which requires states to ensure that authorised persons bear the cost of preventing and controlling pollution. The Protocol also includes a phase-in period giving states five years to comply with the provisions.

Whilst the Convention and Protocol have been successful at halting unregulated dumping and incineration at sea, significant challenges remain including illegal dumping in deliberate breach of the provisions.[83] Further issues relating to state responsibility for dumping have not been determined.[84]

Law of the Sea Convention

The UNCLOS convention deals with various important matters including delineating a state's territorial sea and contiguous zone. In Part V it also deals with the Exclusive Economic Zone (EEZ). Whereas the territorial sea of a state has a breadth up to a limit of 12 nautical miles measured from the baselines determined by the Convention[85] and the contiguous zone may not extend beyond 24 nautical miles from the baselines from which the breadth of the

73 London Convention Protocol, Art. (1.2)
74 London Convention Protocol, Art. 9.
75 London Convention Protocol, Art. 4(1.2).
76 London Convention Protocol, Art. 2.
77 London Convention Protocol, Art. 12.
78 London Convention Protocol, Art. 13.
79 London Convention Protocol, Art. 17.
80 London Convention Protocol, Art. 9(4). The Protocol also refers to the development of compliance procedures: Art. 11.
81 London Convention Protocol, Art. 3.
82 London Convention Protocol, Art. 8.
83 Sands, op. cit., p. 418.
84 P. Birnie, A. Boyle and C. Redgwell, *International Law & the Environment*, 3rd edition, Oxford: Oxford University Press, 2009 p. 431.
85 UNCLOS, Art. 3.

territorial sea is measured,[86] the EEZ is an altogether larger area again. By Article 57 the EEZ of a state 'shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured'. This, in effect, extends a state far out to sea.

By Article 56(1) of UNCLOS it is provided that:

> In the exclusive economic zone, the coastal state has:
>
> (a) sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living . . .;
> (b) jurisdiction . . . with regard to:
>
> . . . (iii) the protection and preservation of the marine environment.

So it is evident that, in the EEZ, although a coastal state has exclusive authority to be able to do certain things, 'the protection and preservation of the marine environment' is one particular matter in regard to which it has jurisdiction which may be exercised. And this clearly would allow the coastal state to adopt strong laws on the subject to prevent marine pollution.

Many more of the provisions in UNCLOS are aimed at marine protection. The most significant of these, for the purposes of this chapter, are included in Part XII. Article 192 creates a general obligation to protect and preserve the marine environment. Whilst states' rights to exploit natural resources are confirmed,[87] this is balanced with their obligation to take 'all measures . . . that are necessary to prevent, reduce and control pollution of the marine environment from any source, using . . . the best practicable means at their disposal and in accordance with their capabilities' to prevent damage by pollution to other states and areas beyond national jurisdiction.[88] Some further detail is provided in the sub-articles that follow, including that such measures should be 'designed to minimize to the fullest possible extent' the 'release of toxic, harmful or noxious substances' from land-based, atmospheric or dumping, and 'pollution from vessels' and 'installations and devices operating in the marine environment' and those 'used in exploration or exploitation of natural resources of the seabed and subsoil'.[89] Specific mention is made of the need to 'protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species'.[90] These goals are to be achieved through global and regional cooperation including notification of imminent danger,[91] the preparation of contingency plans,[92] research and exchange of information,[93] and the development of scientific criteria for the development of regulations.[94] Technical assistance and monitoring and assessment are also areas for state cooperation.[95]

Clearly UNCLOS plays an important part in establishing a firm foundation for the future development of marine pollution law, even though it was concluded after some of the most

86 UNCLOS, Art. 33(2).
87 UNCLOS, Art. 193.
88 UNCLOS, Arts 194(1) and (2).
89 UNCLOS, Art. 194(3).
90 UNCLOS, Art. 194(5).
91 UNCLOS, Art. 198.
92 UNCLOS, Art. 199.
93 UNCLOS, Art. 200.
94 UNCLOS, Art. 201.
95 UNCLOS, Arts 202–6.

significant international law in this area had already been adopted. In some areas UNCLOS provides quite specific provisions, such as those prohibiting dumping in the territorial sea or the EEZ of a state without consent,[96] and the regulation of vessel-source pollution through the adoption of rules, standards and safe routing systems.[97] But in other places there is less detail, particularly regarding land-based marine pollution, which is perhaps one of the reasons why the law is less developed in this area.

Salvage Convention

A further relevant instrument, where the need to protect the marine environment is given central importance, is the Salvage Convention. The Preamble to that Convention states that the parties recognise the desirability of determining by agreement uniform international rules regarding salvage operations. In that regard, the Preamble notes 'in particular the increased concern for the protection of the environment'. It is also stated that the parties are conscious of 'the major contribution which efficient and timely salvage operations can make to the safety of vessels and other property in danger and to the protection of the environment'. With these in mind, the states parties agree to certain uniform rules regarding salvage operations.

Salvage is the reward payable to those saving life or property at sea. Under the Convention only salvage operations which have had a 'useful result' give rise to a reward.[98] Accordingly, except as otherwise provided, no payment is due under the Convention if salvage operations have had no useful result.[99] The criteria for fixing an award are set out in Article 13. Reward is fixed with a view to encouraging salvage operations.[100] Criteria include the salvaged value of the vessel and other property and 'the skill and efforts of the salvors in preventing or minimizing damage to the environment'.[101] The latter was not, until this Convention, part of salvage law at all. Other criteria include: the measure of success obtained by the salvor; the nature and degree of the danger; the skill and efforts of the salvors in salvaging the vessel, other property and life; the time used and expenses and losses incurred by the salvors; the risk of liability and other risks run by the salvors or their equipment; the promptness of the services rendered; the availability and use of vessels or other equipment intended for salvage operations; and the state of readiness and efficiency of the salvor's equipment and the value thereof.

Apart from preventing or minimising damage to the environment being one of the criteria for reward, provision is made in Article 14 for special compensation in that regard which is intended to give a financial incentive to salvors if they try to protect the marine environment, even if they do not succeed in the salvage. Article 14(1) states:

> If the salvor has carried out salvage operations in respect of a vessel which by itself or its cargo threatened damage to the environment and has failed to earn a reward . . . he shall be entitled to special compensation from the owner of that vessel equivalent to his expenses as herein defined.

96 UNCLOS, Art. 210.
97 UNCLOS, Art. 211.
98 UNCLOS, Art. 12(1).
99 See UNCLOS, Art. 12(2).
100 UNCLOS, Art. 13(1).
101 UNCLOS, Art. 13(1)(b).

Then, by Article 14(2), the Convention provides:

> If . . . the salvor by his salvage operations has prevented or minimized damage to the environment, the special compensation payable by the owner to the salvor . . . may be increased up to a maximum of 30% of the expenses incurred by the salvor. However, the tribunal, if it deems it fair and just to do so and bearing in mind the relevant criteria set out in Article 13, paragraph 1, may increase such special compensation further, but in no event shall the total increase be more than 100% of the expenses incurred by the salvor.

Article 14(3) provides that the salvor's expenses under Articles 14(1) and (2) means the out-of-pocket expenses reasonably incurred by the salvor in the salvage operation and a fair rate for equipment and personnel actually and reasonably used in the salvage operation. Article 14(4) states that the total special compensation shall be paid only if and to the extent that such compensation is greater than any reward recoverable by the salvor under Article 13.

To emphasise the importance of the environment to the Convention, Article 14(5) then goes on to provide:

> If the salvor has been negligent and has thereby failed to prevent or minimize damage to the environment, he may be deprived of the whole or part of any special compensation due under this article.

There is also Part B of the Convention (called the *Common Understanding Concerning Articles 13 and 14 of the Convention*), which reads:

> It is the common understanding of the Conference that, in fixing a reward under article 13 and assessing special compensation under article 14 of the International Convention on Salvage, 1989 the tribunal is under no duty to fix a reward under article 13 up to the maximum salved value of the vessel and other property before assessing the special compensation to be paid under article 13.

In other words, a certain priority is, by this, accorded to assessing special compensation which, in turn, reflects the concern of the Salvage Convention in protection of the marine environment.

Conclusion

From the time of OILPOL 54, if not earlier, the world community has seen a need to take a firm stand against pollution of the sea and, thus, of the marine environment. It has responded with a series of conventions. A number of serious maritime incidents have driven this response.

Those conventions include general obligations to protect and preserve the marine environment, frameworks designed to prevent operational and unintentional releases of pollution from vessels, the regulation of deliberate dumping, and liability and compensation regimes. The most important in terms of civil liability is the CLC as amended by the 1992 Protocol. The significance of MARPOL lies in dealing not only with unintentional vessel-sourced oil pollution but with other kinds of pollution as well. The London Convention and Protocol complement these instruments by regulating the deliberate dumping of waste from ships. Protection of the marine environment, as an international concern, is evident in UNCLOS

as well as in the Salvage Convention. Other conventions (such as the Bunkers Convention) have also been noteworthy developments.

Nevertheless, some challenges do remain. First is the issue of failure to implement international law and non-compliance with provisions, particularly by flag states. This is exacerbated by 'flag of convenience' states – countries favoured for ship registration because regulations and enforcement are minimal. Although, as set out above, UNCLOS includes obligations on coastal states to protect and preserve the marine environment, primary regulatory responsibility for vessel construction, design, seaworthiness and safety lies with the state in which a ship is registered – the flag state. Although UNCLOS provides that there should be a 'genuine link' between a ship and its state of registration,[102] this would appear to be aimed at ensuring flag states exercise their responsibility to regulate vessels rather than a test of validity of registration.[103] Many flag of convenience states are influential in the IMO and there has been little progress in addressing the above issue.[104]

Secondly, the CLC, for example, is in need of revision in some areas as there seems little good reason to require legal actions to be brought within three years or no later than six years after the date of an incident. History shows (especially the *Exxon Valdez* disaster) that these periods are far too short. Nor is it at all obvious why an owner should escape liability in the case of a natural phenomenon of 'an exceptional, inevitable and irresistible character'.

Furthermore, not all damage done to the marine environment comes from ships – although much may or does. Land-based pollution, including for example debris, dust and agricultural run-off, impacts significantly on the marine environment. Indeed it has been found that '[l]and-based sources contribute 70 per cent of marine pollution, while maritime transport and dumping-at-sea activities contribute [only] 10 per cent each'.[105] Although UNCLOS called upon states to adopt laws to prevent, reduce and control marine pollution from land-based sources,[106] and the United Nations Environment Programme has implemented the *Global Programme of Action for the Protection of the Marine Environment from Land-based Activities*,[107] there is little hard law at the international level. If the marine environment is to be truly valued and effectively protected, then coastal states, in the next few years, must take serious steps in this regard.

Furthermore, technological advances bring with them novel challenges and risks. For example, seabed activities currently only contribute 1 per cent of marine pollution but this may well increase in the future.[108] International law must develop to meet these new and emerging concerns in ways which do not exacerbate the current fragmented and piecemeal nature of international marine pollution law. Indeed, in time, it may not be too unrealistic to hope for a single convention (perhaps reducing so-called 'treaty congestion'[109]) dealing with all aspects of pollution (on land or on, over or at sea) despoiling or degrading the marine environment.

102 UNCLOS, Art. 91.
103 See Birnie et al., op. cit., pp. 400–1 referring to *MV Saiga (No. 2) (Merits)* ITLOS No 2 (1999).
104 Ibid.
105 *Agenda 21* (1992), Report of the UNCED, I, UN Doc A/CONF.151/26/Rev.1. Ch. 17 para. 17.18.
106 UNCLOS, Art. 207.
107 United Nations Environment Programme *Global Programme of Action for the Protection of the Marine Environment from Land-based Activities*. Online. Available HTTP: <www.gpa.depiweb.org/> (accessed 29 February 2012).
108 Louka, op. cit., p. 147.
109 This topic is the subject of D. Anton's Chapter 36 in this volume.