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The Use of LNG as a Marine Fuel: Civil Liability Considerations from an International Perspective

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ABSTRACT

Recent regulations in the maritime domain have placed increasing pressure on the shipping industry to reduce exhaust emissions from ships. Using LNG, which produces virtually 0% sulphur dioxide emissions, as an alternative fuel has thus become an attractive option to shipowners. However, the absence of a comprehensive legal framework in this regard is noteworthy, particularly in view of the fact that the issue of liability for pollution damage and the corresponding issue of compensation is a lacuna in the domain of international maritime law. This article examines this issue in detail and proposes that there is an urgent need to develop an international legal regime, and within the current framework and without abandoning the established regimes, amending the Carriage of Hazardous and Noxious Substances by Sea may well be a better option.

KEYWORDS: LNG, marine fuel, civil liability

1. INTRODUCTION AND BACKGROUND

It is well known that around 90% of world trade is carried out through international shipping.¹ It is thus no exaggeration that shipping is indispensable to the growth of the world economy. Given the scale of the activity, although shipping is the most carbon-efficient mode of transportation,² exhaust emissions from ships still constitute a significant proportion of global CO₂ emissions.³ Furthermore, the strong downward

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1 See <<http://www.ics-shipping.org/shipping-facts/shipping-and-world-trade>> accessed 30 November 2016.

2 To put things into perspective, it has been observed that '[a] ton of goods can be shipped from the Port of Melbourne, Australia to the Port of Long Beach, U.S.A, a distance of 12,770 kilometres while generating fewer CO₂ emissions than are generated when transporting the same cargo in the U.S. by truck from Dallas to Long Beach, a distance of 2,307 kilometres.' See <<http://www.worldshipping.org/benefits-of-liner-shipping/low-environmental-impact>> accessed 30 November 2016.

3 In the year 2007, for example, shipping was responsible for the emission of 870 million tonnes of CO₂. This amounted to about 2.7% of global CO₂ emissions. See International Maritime Organization, *Second*

trend in land-based SO₂ emissions is not being matched by the shipping sector.⁴ In an attempt to counter the extant situation, various initiatives are underway at the global level to reduce the impact of ship exhaust emissions. The most relevant among these is the lowering of the permissible sulphur content in marine fuel through recent amendments to MARPOL and EU legislation.⁵ The new limits on sulphur content in marine fuel have forced the shipping industry to seek ways to achieve compliance with the new regulations. LNG, which produces virtually 0% sulphur dioxide emissions, is an alternative available to shipowners to enable compliance. In this regard, the new regulations serve as a catalyst for encouraging the use of LNG as a marine fuel. LNG is becoming the fuel choice of an increasing variety of vessels⁶ and this trend is likely to continue. A recent study estimated that by 2018–20 about 30% of new ships will be delivered with gas engines.⁷ In August 2014, for example, the world's first dual-fuel slow-speed engine was installed into the world's first LNG-powered containership.⁸

Whereas from an environmental standpoint, this development is no doubt an improvement, the absence of a comprehensive legal framework governing the use of LNG as a marine fuel is noteworthy. On the regulatory side of the legal spectrum, although it has a few deficiencies, a regime addressing the safe construction and operation of LNG fuelled vessels has recently been adopted;⁹ however, the issue of

IMO GHG Study 2009 (April 2009) <<http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Documents/GHGStudyFINAL.pdf>> accessed 30 November 2016. In 2012, international shipping emitted 796 million tonnes of CO₂. This amounted to about 2.2% of global CO₂ emissions. See International Maritime Organization, *Third IMO Greenhouse Gas Study 2014* <<http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Documents/Third%20Greenhouse%20Gas%20Study/GHG3%20Executive%20Summary%20and%20Report.pdf>> accessed 30 July 2016.

- 4 AJ Dore and others, 'Modelling the Atmospheric Transport and Deposition of Sulphur and Nitrogen over the United Kingdom and Assessment of the Influence of SO₂ Emissions from International Shipping' (2007) 41 *Atmospheric Environment* 2355, 2365.
- 5 International Convention for the Prevention of Pollution from Ships, 1973 and its Protocols of 1978 and 1997, 12 International Legal Materials 1319 (1973). In 2008, a number of amendments to Annex VI of MARPOL were adopted. These amendments introduced several important changes: effective from 2012, the global sulphur cap was reduced to 3.50% with a potential further decrease to 0.50% in January 2020, subject to a feasibility review to be completed no later than 2018. Stricter limits were also introduced in Sulphur Emission Control Areas, where a limit of 1.00% became applicable from 1 July 2010 and a 0.10% limit will apply from 1 January 2015 onwards. Parallel limits are effective under EU law. See Council Dir 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels and amending Dir 93/12/EEC [1999] OJ L121/13, (as amended).
- 6 As an example, in 2013 the *M/S Viking Grace*, the world's largest LNG-fuelled passenger vessel was delivered. Viking Line, the ferry company which owns it, celebrated the vessel's first anniversary in January 2014. See <<http://www.vikinggrace.com/about/>> accessed 30 November 2016.
- 7 See DNV, *Shipping 2020 Report* <<https://www.oecd.org/sti/ind/4%20Longva%20-%20DNV%20-%2029Nov12.pdf>> accessed 30 November 2016. See also a study conducted by Lloyd's Register: *LNG-fuelled Deep Sea Shipping: The Outlook for LNG Bunker and LNG-fuelled Newbuild Demand Up to 2025* (August 2012) <http://www.lr.org/en/_images/229-77161_LR_bunkering_study_Final_for_web_tcm155-243482.pdf> accessed 30 November 2016.
- 8 See UASC, 'UASC Names First Ever Lng-Ready Ultra Large Container Vessel At Hhi Shipyard In Ulsan' <<http://www.uasc.net/en/news/141127/uasc-names-first-ever-lng-ready-ultra-large-container-vessel-hhi-shipyard-ulsan>> accessed 30 November 2016.
- 9 The International Code for Ships Using Gas or Other Low Flash-Point Fuels (IGF Code). For a detailed analysis of the regulatory regimes governing the use of LNG as a marine fuel, see Jingjing Xu, David Testa

liability for pollution damage and the corresponding issue of compensation is pretty much a lacuna in the domain of the international maritime law.

It must be recognised that even if the most stringent safety standards are applied, experience shows that accidents cannot always be prevented. While the importance of developing technical rules geared to make the utilisation of LNG as a marine fuel as safe as possible is indisputable, it is equally necessary and important to be prepared for unexpected eventualities. With the increase in the numbers and types of ships utilising LNG fuel, chances of an accident occurring are expected to grow significantly.

Compared with traditional fuel oil, LNG has qualities that effectively make it less likely to cause certain kinds of damage. For example, given that the density of LNG is considerably less than that of water (3.9 pounds per gallon, as opposed to 8.3 pounds per gallon), if LNG spills over water it will float on top and rapidly vaporise.¹⁰ In contrast to an oil spill, no traditional clean-up of pollution damage would be necessary in the aftermath of a substantial LNG spill. Furthermore, LNG has a restricted flammability range,¹¹ with an upper flammability limit of about 5% and a lower flammability limit of roughly 15%.¹²

However, while the chances of environmental damage resulting from a leak of LNG are somewhat limited, other kinds of damage, such as damage to property and human health, remain a tangible possibility that needs to be addressed. In fact, such dangers are many, and may vary according to numerous factors such as environmental conditions, and the site and size of the LNG spill. By way of example, cryogenic damage could result from direct contact; pressure waves may result from a rapid phase transition that may occur when there is a mixing of LNG and water; and pool fires may occur and if the spreading pool of LNG on water does not immediately ignite, a vapour cloud forms and a flash fire may occur in the presence of an ignition source. Moreover, if the LNG vapour cloud is in a confined area, a gas explosion can occur.¹³

As such, it must be anticipated that liability issues will arise following an incident involving the use of LNG as a marine fuel and it is of utmost importance to have in place a viable liability and compensation regime taking account of the multiplicity of factors that influence the settlement of pollution damage claims, judicial or otherwise. Notably, there is convention law covering liability and compensation for oil and bunker pollution damage from tankers, bunker pollution damage from non-

and Proshanto Mukherjee, 'The Use of LNG as A Marine Fuel: International Regulatory Framework' (2015) 46 *Ocean Development and International Law* 225–40.

- 10 Michelle Michot Foss, *LNG Safety and Security* (Centre for Energy Economics June 2012) 13 <http://www.beg.utexas.edu/energyecon/LNG_Safety_and_Security_Update_2012.pdf> accessed 30 November 2016.
- 11 Flammability range represents the lower and upper concentrations of a particular gas that, if present in air, will ignite if exposed to an ignition source. If the concentration of LNG in air is lower than its lower flammability limit or higher than its upper flammability limit, no explosion can occur (notwithstanding the presence of an ignition source).
- 12 Foss (n 10) 10. See also Gregory Noll and Michael Hildebrand (eds), *Hazardous Materials: Managing the Incident* (4th edn, Jones & Bartlett 2014) 370, 373.
- 13 Juan Vilchez, Diana Villafane and Joaquim Casal, 'A Dispersion Safety Factor For LNG Vapour Clouds' [2013] *Journal of Hazardous Materials* 182.

tankers, and damage from hazardous and noxious substances which includes LNG carried as cargo, but a liability and compensation regime for damage caused by LNG marine fuel is conspicuous by its absence.

It is necessary to mention at this preliminary juncture that given the international nature of the shipping industry, the maritime community at large has extended full support for the adoption of international conventions to govern liability and compensation in relation to ship-source pollution; and by the same token, unilateral legislative action by states has been considered highly undesirable. If a lacuna in the international law continues to exist in respect of these issues pertaining to use of LNG as marine fuel, the matter will likely fall to be governed by diverse domestic laws causing needless fragmentation and uncertainty for shipowners and pollution victims seeking recourse.

The purpose of this article is to analytically examine issues of liability and compensation arising from damage caused by a release of LNG marine fuel and, ultimately, to determine the best way forward for the creation of a new international regime dealing with such liability issues. As mentioned, there are international liability conventions covering liability and compensation relating to other ship-generated pollutants. Although they do not deal directly with incidents involving the use of LNG as a marine fuel, they can provide the rationale and a sound model for a new convention with custom-designed provisions. In the next section of this article, the relevant international conventions are examined in this vein.¹⁴ Given the absence of subject-specific international legislation, domestic law could well apply to a given incident which is why it is considered in the third section of this article as a potential source of law. The consequences of having domestic law as opposed to globally applicable international law are analysed. To complete the examination of liability issues, the potential direct or indirect applicability of the Convention on Limitation of Liability for Maritime Claims¹⁵ to incidents relating to the use of LNG as a marine fuel is considered. Related to this, the merits of compulsory insurance for LNG fuelled ships are analytically examined. It is submitted that compulsory insurance is required to counterbalance the shipowner's right to limit its liability following an incident. Finally, a proposition for a liability regime at the international level is made in the fourth section of the article and a number of proposals are put forward in this regard. Three main questions are considered at this point: What should be the basis of liability? Who should be liable? Should liability be limited?

14 'The International Convention on Civil liability for Oil Pollution Damage' (1969) 9 International Legal Materials 45 (CLC); the 'International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage' (1992) 11 International Legal Materials 284 (Fund Convention); the 'International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea' (1996) 35 ILM 1415, amended by its Protocol of 2010 to be known as the HNS Convention, 2010 (HNS Convention) and the International Convention on Civil Liability for Bunker Oil Pollution Damage IMO LEG/CONF.12/19 (1991) (Bunkers Convention).*

15 'Convention on Limitation of Liability for Maritime Claims' (1977) 16 International Legal Materials 606 (LLMC Convention).

2. THE RELEVANT LIABILITY AND COMPENSATION CONVENTIONS

A number of private law conventions may provide a basis and rationale for the proposition that an international convention regime should be developed for dealing with damage claims arising from the use of LNG as a marine fuel. The International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS Convention) covers, *inter alia*, liability issues arising in relation to the carriage of LNG as cargo. The International Convention on Civil Liability for Oil Pollution Damage (CLC), the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (Fund), and International Convention on Civil Liability for Bunker Oil Pollution Damage (Bunkers Conventions) deal with oil pollution. Given that they are all liability and compensation conventions relating to ship-source marine pollution, they share a number of significant common features that should be carefully considered in the development of an international regime as envisaged in this article. It must be noted at the outset that the CLC and Fund are companion conventions addressing liability and compensation in two tiers. The CLC provides for shipowner's liability and corresponding compensation paid by the Protection & Indemnity (P&I) Club up to the limit set by the convention, whereas the Fund Convention provides for compensation paid by the oil industry up to the limit set by that convention. By contrast, the HNS is a single-tier convention that addresses both those components in one instrument. The relationship between the CLC/Fund and the Bunkers Convention is examined in particular. The present lacuna in the HNS Convention, which governs liability in relation to the carriage of LNG as cargo but not as a marine fuel, is a reminder of the gap that was once left open by the CLC/Fund and was eventually addressed by the Bunkers Convention.

2.1 The Civil Liability and Fund Conventions

The CLC/Fund regime is significant in the field of private maritime law in that it has established some fundamental principles, as reflected in the salient features discussed above, on which some other international conventions dealing with liability and compensation issues pertaining to ship-source marine pollution are modelled, such as the HNS Convention and the Bunkers Convention. The CLC was adopted by the Intergovernmental Maritime Consultative Organization (IMCO) (now International Maritime Organization (IMO)) in 1969 with the object of providing adequate compensation to victims of oil pollution damage resulting from maritime casualties involving tankers.¹⁶ In 1971, the Fund Convention was adopted as a companion to the 1969 CLC. Pursuant to the Fund Convention, the International Oil Pollution Compensation (IOPC) Fund was established to provide compensation beyond the limits of liability of the CLC where compensation under it was inadequate or unavailable;¹⁷ and the Fund itself is financed by annual levies exacted from importers of oil

16 See <[http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-on-Civil-Liability-for-Oil-Pollution-Damage-\(CLC\).aspx](http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-on-Civil-Liability-for-Oil-Pollution-Damage-(CLC).aspx)> accessed 30 November 2016.

17 The IOPC Fund is an entity with legal personality which can sue and be sued. The governing bodies of the Fund are the Assembly and the Administrative Council serviced by a Secretariat.

cargo.¹⁸ The CLC 1969 and the 1971 Fund Convention were amended in 1992 by the adoption of two protocols. The instruments so amended, known as the 1992 CLC and the 1992 Fund Convention,¹⁹ provide for higher limits of compensation and a wider scope of application.

As of 16 May 1998, State Parties to the 1992 Protocol to CLC ceased to be parties to the 1969 CLC according to a mechanism established in the 1992 Protocol for compulsory denunciation of the old regime. There are still a number of states that have not yet ratified the 1992 Protocol; they continue to be bound by the 1969 CLC. By contrast, according to its 2000 Protocol, the 1971 Fund Convention ceased to have effect as of 24 May 2002.²⁰ Most recently, in 2003, a Supplementary Fund Protocol was adopted introducing an optional third tier of compensation for State Parties to the 1992 CLC and the 1992 Fund Convention. The latter instrument entered into force on 3 March 2005.

The importance of the CLC regime is evident from the vast number of states that have become parties to it. At the time of writing, 114 states including all major flag states are parties to both the 1992 CLC and the 1992 Fund Convention, 21 states are parties to the 1992 CLC but not to the Fund, 34 states remain parties to the 1969 CLC, and 31 states are parties to the 2003 Supplementary Fund Protocol.²¹

The legal regime of CLC is one of strict liability or liability without the need for proof of fault of the shipowner, subject however, to a number of exceptions in respect of which the onus is placed on the defendant shipowner to extricate himself from liability.²² The geographical scope of application of the 1992 CLC/Fund regime is the outer limit of the exclusive economic zone or 200 nautical miles measured from the territorial sea baselines of the relevant State Party to the conventions.²³ As such, the application is location-based rather than whether the flag state of the relevant ship, regardless of wherever it may be located, is a State Party to

18 Any person who in one calendar year is the receiver of more than 150,000 tonnes of crude oil and heavy oil after transportation by sea in ports or terminal installations of any State Party to the Convention is subject to the levy. See art 10 para 1 of Fund Convention. See also Måns Jacobsson, 'The International Oil Pollution Compensation Fund: Ten Years Of Claims Settlement Experience' (International Oil Spill Conference Proceedings: February 1989) 509.

19 Both entered into force on the 20 May 1996.

20 The purpose of the 2000 Protocol was to terminate the 1971 Fund Convention. To this effect, the 2000 Protocol determined that the 1971 Fund Convention would cease to be in force as from the date when the number of contracting parties fell below 25. This happened on the 24 May 2002 as a result of the denunciation by State Parties to the 1971 Fund in favour of their 1992 Fund membership.

21 See <<http://www.iopcfunds.org/about-us/membership/a-z-listing/#fund-0>> accessed 30 November 2016.

22 Under art III para 2, no liability for pollution damage attaches to the shipowner if he proves that the damage:

1. resulted from an act of war, hostilities, civil war, insurrection or a natural phenomenon of an exceptional, inevitable and irresistible character, or
2. was wholly caused by an act or omission done with intent to cause damage by a third party, or was wholly caused by the negligence or other wrongful act of any Government or other authority responsible for the maintenance of lights or other navigational aids in the exercise of that function. Under art III para 3, the shipowner may also be exonerated wholly or partially from liability if he proves that the pollution damage resulted wholly or partially either from an act or omission done with intent to cause damage by the person who suffered the damage or from the negligence of that person.

23 See art II (a).

the conventions.²⁴ Pursuant to Article II, other than pollution damage, the CLC also applies to preventive measures, wherever taken, to prevent or minimize damage.

The CLC provides for compulsory insurance, otherwise referred to as 'financial responsibility' or 'financial security', and limitation of liability. The owner of a ship registered in a contracting state and carrying more than 2,000 tons of oil in bulk as cargo must maintain insurance or other financial security in the sums fixed by applying the limits of liability prescribed by Article 7 of the Convention. In practice, insurers issue respective shipowners with a standard form certificate known as the blue card which shipowners can then submit to the competent flag state authorities with a view to obtaining an insurance certificate in the form that is prescribed by the Convention.²⁵ It is notable that claims for pollution damage under the CLC can be brought directly against the insurer of the shipowner's liability for pollution damage. In such 'direct action' cases, it has been noted that the insurer will normally tend to have more limited defences than would be available under the general domestic legislation of many jurisdictions, even if a number of defences may still be applicable.²⁶

The limitation provision in Article 5 entitles the shipowner to limit his liability in respect of any one incident to an aggregate amount calculated as follows:

- a. 4,510,000 units of account²⁷ for a ship not exceeding 5,000 units of tonnage;
- b. for a ship with a tonnage in excess thereof, for each additional unit of tonnage, 631 units of account in addition to the aforementioned 4,510,000 units of account;

The maximum aggregate amount to which a shipowner may be held liable is capped at 89,770,000 units of account and the right to limit liability is lost only if it is proved that the pollution damage resulted from the shipowner's personal act or omission, committed with the intent to cause the damage, or recklessly and with knowledge that such damage would probably result.²⁸

An important question in relation to this discussion is whether the CLC can apply to damage caused by the spill of LNG carried as marine fuel. The answer relates to a number of important definitions in the Convention. The definition of 'pollution damage' in Article I(6) is 'loss or damage caused outside the ship by contamination resulting from the escape or discharge of *oil* (emphasis added) from the *ship* (emphasis added)'. 'Oil', as defined in Article I(5) means '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'. The definition of

24 Jingjing Xu, 'The International Legal Framework Governing Liability and Compensation for Ship-Source Oil Pollution Damage' in Maximo Mejia (ed), *Selected Issues In Maritime Law and Policy* (Nova Science Publishers 2013) 110. Limited geographical application is also a feature of the HNS and Bunkers Conventions which is discussed in this article.

25 See Måns Jacobsson, 'Liability and Compensation for Ship-Source Pollution' in David Attard and others (eds), *The IMLI Manual on International Maritime Law: Volume III* (OUP 2016) 285, 304.

26 *ibid.*

27 The unit of account is a Special Drawing Right (SDR). See art 5(9) of the 1992 CLC Convention.

28 art V para 2.

'ship' in Article I, paragraph 1 is 'any sea-going vessel and seaborne craft of any type whatsoever constructed or adapted for the carriage of oil in bulk as cargo ...'. Clearly, LNG is not oil and thus damage caused by LNG used as fuel is not covered by the CLC. However, if an LNG fuelled ship is constructed or adapted for the carriage of oil in bulk as cargo, it would fall within the definition of a CLC ship. Thus, in an incident where both oil cargo and LNG fuel are discharged in an area falling within the geographical scope of application of the CLC, arguably, the CLC will apply but will only apply to damage caused by the spill of oil cargo.

2.2 The HNS Convention

The HNS Convention,²⁹ adopted in 1996, aims 'to ensure adequate, prompt and effective compensation for damage to persons and property, costs of clean up and reinstatement measures and economic losses resulting from the maritime transport of hazardous and noxious substances'.³⁰ Article 1(1) provides the definition of 'ship' as 'any seagoing vessel and seaborne craft, of any type whatsoever'. This wide definition is then narrowed down by Article 4(4), which excludes the Convention's application to warships, naval auxiliary or other ships owned or operated by a state and used, for the time being, only on Government non-commercial service.³¹ The definition of 'HNS' as provided by the Convention is considerably broad.³² It includes packaged goods, bulk solids, liquids and liquefied gases, and is 'largely based on lists of individual substances that have been previously identified in a number of IMO Conventions and Codes designed to ensure maritime safety and prevention of pollution'.³³ This is evident in Article 1(5)(a)(v) which includes liquefied gases as hazardous and noxious substances:

[L]iquefied gases as listed in chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, as amended, and the products for which preliminary suitable conditions for the

29 Since by 2009 the 1996 HNS Convention had not entered into force (due to an insufficient number of ratifications), in April 2010 a second International Conference opted for the adoption of a Protocol to the 1996 HNS Convention as a means of addressing the practical problems which had hindered the 1996 HNS Convention from coming into force. The 2010 HNS Convention will enter into force 18 months following the date on which it is ratified by at least 12 states, including 4 states each with no less than 2 million units of gross tonnage, and having received during the preceding calendar year a total quantity of at least 40 million tonnes of cargo that would be contributing to the general account.

30 See <<http://www.hnsconvention.org/Pages/TheConvention.aspx>> accessed 30 November 2016.

31 Under art 4(5), however, State Parties may decide to make the convention applicable to vessels referred to in art 4(4). If they do so, they must notify the IMO Secretary-General, specifying the terms and conditions of such decision. In this context it must be pointed out that pursuant to art 5(1) a state may, at the time of ratification, acceptance, approval of, or accession to the Convention, or at any time thereafter, declare that the HNS Convention does not apply to ships: (1) which do not exceed 200 gross tonnage; (2) which carry hazardous and noxious substances only in packaged form; and (3) while they are engaged on voyages between ports or facilities of that state. All of these three conditions must be satisfied for a state to be able to exclude application of the Convention in this way.

32 See art I para 5, subparagraph (a) items (i) to (vii), para (b) referring to residues from previous carriage in bulk; para 5 *bis* providing definition of 'bulk HNS'; and para 5 *ter* providing definition of 'packaged HNS'.

33 Xu (n 24) 122.

carriage have been prescribed by the Administration and port administrations involved in accordance with paragraph 1.1.6 of the Code.

Methane is an LNG among the liquefied gases listed in Chapter 19 of the IGC Code, thereby leaving no doubt that LNG is to be considered a hazardous and noxious substance under the 2010 HNS Convention. However, under Article 1(5)(a) and (b), the Convention's scope of application is limited to hazardous and noxious substances including LNG carried on board a ship as cargo, or as residues from their previous carriage in bulk. Clearly, LNG carried as fuel for the ship's propulsion is not cargo, and therefore does not constitute carriage of LNG by sea as intended by the Convention whether the carriage pertains to purpose-built LNG carriers or non-LNG carriers.³⁴ Thus in the case of LNG carriers, the Convention covers only LNG carried as cargo or as residue of a previous carriage in bulk but not as fuel for their own propulsion.

The imposition of a levy, which sustains the HNS fund is yet another indication that the 2010 HNS applies only to the shipboard carriage of LNG cargo in bulk or as a residue from a previous carriage. It is noteworthy that the HNS Convention essentially consists of a two-tiered compensation scheme within a singular legal regime. The first tier is compulsory insurance usually provided by the shipowner's P&I Club to cover compensation in respect of third-party liability. The second tier is a compensation fund known as the International Hazardous and Noxious Substances Fund (HNS Fund) financed through contributions of receivers of hazardous and noxious substances.³⁵ It becomes available in the event the liability insurance does not cover an incident or is insufficient to satisfy all claims. The regime is similar to the CLC/IOPC Fund scheme except that the HNS Fund has one general account and three separate accounts as follows:³⁶

- a. oil as defined in article 1, paragraph 5(a)(i) (oil account);
- b. liquefied natural gases of light hydrocarbons with methane as the main constituent (LNG) (LNG account); and
- c. liquefied petroleum gases of light hydrocarbons with propane and butane as the main constituents (LPG) (LPG account).

With regard to the LNG account in particular, Article 19 provides that annual contributions to the LNG account shall be made in respect of each State Party by any person who in the preceding calendar year, or such other year as the Assembly may decide, was the receiver in that state of any quantity of LNG. Contributions

34 art 1(9) defines 'carriage by sea' as 'the period from the time when the hazardous and noxious substances enter any part of the ship's equipment, on loading, to the time they cease to be present in any part of the ship's equipment, on discharge . . .'

35 See Ch 3 of the HNS Convention.

36 Separate accounts were introduced because during the drafting of the Convention it became clear that a single fund based system would be disadvantageous to sectors that are relatively safer but more likely to transport large volumes of cargo. The creation of separate accounts was devised to avoid the cross-subsidization of damages. See Rosalie Balkin, *The HNS Protocol* <<http://www.imo.org/KnowledgeCentre/PapersAndArticlesByIMOSTaff/Documents/The%20HNS%20Protocol%20-%20R%20Balkin.pdf>> accessed 30 November 2016.

may also be made by the person who immediately before its discharge held the title to an LNG cargo discharged in a port or terminal of the state, provided that the titleholder has entered into an agreement with the receiver that the titleholder shall make such contributions and the receiver has informed the State Party that such an agreement exists. In cases, where LNG is used exclusively as a fuel for the ship it is clear that no party would be the receiver of LNG cargo in a State Party, thereby indicating that this situation was not contemplated, intentionally or otherwise, by the drafters of the 2010 HNS Convention.

Another interesting point that is worthy of mention is the definition of ‘damage’.³⁷ Unlike the Bunkers Convention and the CLC and Fund Convention, in which the term ‘pollution damage’ is used, ‘damage’ in the HNS Convention extends beyond pollution damage to cover such things as damage by fire or explosion. Thus, ‘pollution damage’ found in the Civil Liability and Fund Conventions is replaced by the term ‘damage’ in the 2010 HNS Convention. The definition of ‘damage’ in Article 1(6) encompasses loss of life or personal injury, loss of or damage to property, loss or damage by contamination of the environment and costs of preventive measures.³⁸

That all these categories of damage are encompassed by the Convention is significant, especially when considering the specific characteristics of LNG and, therefore, the kind of liability issues that can be envisaged with regard to an incident involving a spill of LNG fuel. While it would not make sense to exclude the possibility of pollution damage arising as a consequence of an incident involving LNG, it would be equally senseless to have a Convention that deals with LNG liability issues covering only pollution damage while failing to provide for other types of damage, such as loss of life and personal injury. With its wide definition of ‘damage’, the HNS Convention covers much ground in terms of liability arising out of an LNG incident, even though it only applies where LNG is carried in bulk as cargo or as a residue following such carriage.

The HNS Convention varies from the CLC and Bunkers Conventions in terms of its geographical scope of application. While the two latter Conventions apply to any pollution damage that occurs within the territory (including territorial sea and EEZ) of a State Party, determination of the HNS Convention’s application is more complicated and depends on the type of damage caused. According to Article 3, the Convention applies:

- a. to any damage caused in the territory, including the territorial sea, of a State Party;

37 See Xu (n 24) 123 in which the author explains that in comparison with the definition of ‘pollution damage’ in CLC 1992 and the Bunkers Convention, art 1(6) of the HNS Convention in its definition of ‘damage’ refers to ‘loss of life and personal injury’ which is a unique feature not found in the other two conventions. In art 1(9) of the Bunkers Convention, for example, ‘pollution damage’ is defined as ‘loss or damage caused outside the ship by contamination resulting from the escape or discharge of bunker oil from the ship . . .’ and ‘the costs of preventive measures and further loss or damage caused by preventive measures’.

38 For the complete definition, see art 1(6).

- b. to damage by contamination of the environment caused in the exclusive economic zone of a State Party, established in accordance with international law, or, if a State Party has not established such a zone, in an area beyond and 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 baselines from which the breadth of its territorial sea is measured;
- c. to damage, other than damage by contamination of the environment, caused outside the territory, including the territorial sea, of any State, if this damage has been caused by a substance carried on board a ship registered in a State Party or, in the case of an unregistered ship, on board a ship entitled to fly the flag of a State Party; and
- d. to preventive measures, wherever taken, to prevent or minimize such damage as referred to in (a), (b) and (c) above.

As in the CLC, the HNS Convention has a strict liability regime with a number of exceptions which are almost identical to those in the CLC, except that Article 7(2)(d) provides an additional exemption pertaining to shipper's failure to furnish accurate information regarding the hazardous and noxious nature of the substances shipped.³⁹

Another similarity that the HNS Convention shares with the other pollution liability Conventions is the requirement for compulsory insurance. However, it is a general requirement and not one based on minimum carriage (as in the CLC Convention) or on minimum gross tonnage of the ship (as in the Bunkers Convention). Insurance is compulsory to the extent necessary to cover the maximum liability that may be incurred by the shipowner under the Convention's limitation regime. Under Article 9, where damage is caused by bulk HNS the shipowner may limit his liability to 10 million units of account⁴⁰ for a ship not exceeding 2,000 units of tonnage. For a ship with a tonnage in excess thereof, the following amount in addition to the aforementioned 10 million units: for each unit of tonnage from 2,001 units to 50,000 units of tonnage, 1,500 units of account; for each unit of tonnage in excess of 50,000 units of tonnage, 360 units of account. The aggregate amount can in no case exceed 100 million units of account, which is therefore the maximum liability that may be incurred under the HNS Convention.

2.3 The Bunkers Convention

Before the adoption of the Bunkers Convention, the international legal framework for ship-source pollution damage was inchoate in view of the fact that pollution damage from bunker oil of non-tankers was not covered by the CLC. This lacuna in the

39 art 7(2)(d) provides that no liability attaches to the owner if he proves that 'the failure of the shipper or any other person to furnish information concerning the hazardous and noxious nature of the substances shipped either (i) has caused the damage, wholly or partly; or (ii) has led the owner not to obtain insurance in accordance with article 12; provided (in both cases) that neither the owner nor its servants or agents knew or ought reasonably to have known of the hazardous and noxious nature of the substances shipped'.

40 The unit of account is a Special Drawing Right. See art 9(9) of the HNS Convention.

law was significant because large non-tankers such as bulk carriers and container ships often carried more bunker oil on board than, for example, relatively small coastal tankers. The situation was eventually remedied by the adoption of the Bunkers Convention in 2001.⁴¹ The Convention entered into force on 21 November 2008 after the requisite number of ratifications was reached. Its aim is to provide for prompt and adequate payment of compensation to victims of pollution damage attributable to bunker oil spills from non-tankers. As in the ship-source pollution conventions discussed above, the Bunkers Convention provides for a regime of strict liability in conjunction with the availability of the usual exceptions.

In Article 1(1), 'ship' is defined as 'any seagoing vessel and seaborne craft, of any type whatsoever'. This seemingly broad definition is narrowed down by subsequent provisions. Under Article 4(1), the Convention does not apply to pollution damage as defined in the CLC Convention, whether or not compensation is payable under that Convention. Under Article 4(2) and (3), the Convention does not apply to war-ships, naval auxiliary or other ships owned or operated by a state and used, for the time being, only on Government non-commercial service; unless a State Party wishes to do so, in which case it must notify the Secretary-General specifying the terms and conditions of its decision. Unlike the CLC and HNS regimes, the compensation regime under the Bunkers Convention is a single-tier scheme where liability is exclusively that of the shipowner up to the relevant limits of liability under the Convention;⁴² and notably, 'shipowner' in the Bunkers Convention bears a much wider connotation, which means 'the owner, including the registered owner, bare-boat charterer, manager and operator of the ship'. During the negotiations leading up to the adoption of the Convention, it was concluded that in the majority of cases a single-tier regime would be sufficient to provide full compensation for damage caused by bunker oil spills.

Like the CLC and HNS regimes, the Bunkers Convention requires registered owners of ships with gross tonnage greater than 1,000 to maintain compulsory third-party liability insurance.⁴³ This is a departure from the CLC where the figure is 2,000 tonnes, as well as the HNS where there is no minimum threshold. Interestingly and importantly, unlike the other instruments mentioned above, the Bunkers Conventions does not have its own limitation scheme but rather refers to 'any applicable national or international regime, such as the Convention on Limitation of Liability for Maritime Claims 1976 as amended' in Article 6.

41 Xu (n 24) 118. It is also pointed out at 106, that 'bunker oils are of highly viscous and persistent nature and the chemical composition makes it more harmful than cargo oil'.

42 Under art 6, the shipowner retains the right to limit his liability under any applicable national or international regime, such as the Convention on Limitation of Liability for Maritime Claims 1976 as amended.

43 art 7 provides as follows:

'The registered owner of a ship having a gross tonnage greater than 1000 registered in a State Party shall be required to maintain insurance or other financial security, such as the guarantee of a bank or similar financial institution, to cover the liability of the registered owner for pollution damage in an amount equal to the limits of liability under the applicable national or international limitation regime, but in all cases, not exceeding an amount calculated in accordance with the Convention on Limitation of Liability for Maritime Claims, 1976, as amended.'

Perhaps most importantly, the point needs to be made that at any rate, the Bunkers Convention does not cover LNG used as fuel. Liability under the Bunkers Convention is addressed in Article 3 in the following words:

... the shipowner at the time of an incident shall be liable for pollution damage *caused by any bunker oil* [emphasis added] on board or originating from the ship ...

Juxtaposed with the above provision is the definition of 'bunker oil', which in Article 1.5 is stated as 'any hydrocarbon mineral oil, including lubricating oil, used or intended to be used for the operation or propulsion of the ship, and any residues of such oil'. It is clear from the above two provisions that the scope of the Bunkers Convention does not extend to LNG used as fuel for propulsion because it is simply not hydrocarbon mineral oil.

3. DOMESTIC LAW APPLICATION AND THE NEED FOR AN INTERNATIONAL CONVENTION

3.1 Application of domestic law

As emerges from the above discussion, the CLC, HNS and Bunkers Conventions cannot accommodate a civil liability and compensation regime in respect of damage from LNG used as a fuel. Liability and compensation issues are bound to arise in the event of an accidental release of LNG fuel which might occur despite the effectuation of stringent regulatory measures. Given this extant bleak scenario, in the absence of international convention law, it is quite likely that unilaterally enacted domestic law will be applied in such situations; ie liability issues relating to damage caused by LNG fuel spills will fall to be governed by domestic legislation of the jurisdiction which is the physical locus of the damage. However, the lack of uniformity will, of course, invariably lead to global fragmentation of the law together with uncertainty and unpredictability from the perspective of legal professionals and the judiciary. Adequacy of compensation, if at all available, will become a serious issue which the world maritime community will have to confront.

If a casualty involving the use of LNG as fuel occurs within a domain subject to the domestic jurisdiction of one state or another, first, it will have to be determined which particular legal regime will apply. There may be specific legislation in place derived from liability principles of relevant international convention law; otherwise, the general law of torts or delict will apply. It is recognised that there are variances in the law between civil and common law jurisdictions; as well, there may be differences among states belonging to the same legal system. The uncertainty and unpredictability engendered by such differences will result in serious detriment to pollution victims and shipowners alike. From the shipowner's viewpoint, lack of uniformity in limitation regimes of various jurisdictions including the possibility of unlimited liability will be a major problem. A major disadvantage for the pollution victim in such instances is that in the domestic law of most jurisdictions, liability in tort or delict is usually fault based. If there is strict liability, it must be expressly provided for in the relevant legislation or doctrine. Furthermore, in the case of legislation implementing

the CLC, HNS or Bunkers Conventions, there is provision for compulsory insurance to cover liability up to the prescribed limit. Unless there are similar provisions in domestic legislation requiring compulsory insurance in respect of ships using LNG as fuel, it is possible that shipowners of LNG fuelled ships may be operating uninsured. Indeed, the issues of limitation of liability and compulsory insurance are of prime importance and deserve utmost attention in the context of this discussion, and as such, are discussed in more detail in the text further.

3.2 Limitation of liability

The merits and demerits of the concept of limitation of liability have been discussed extensively elsewhere.⁴⁴ Suffice it to say in the present context that unlimited liability may spell financial ruin for the shipowner. The Convention on Limitation of Liability for Maritime Claims (LLMC Convention) was adopted with the aim of determining uniform rules relating to limitation of liability for maritime claims. The Convention has at its basis the assumption that a balance needs to be struck 'between the desire to ensure, on the one hand, that a successful claimant should be suitably compensated for any loss or injury which he had suffered and, on the other hand, the need to allow shipowners, for public policy reasons, to limit their liability to an amount which was readily insurable at a reasonable premium'.⁴⁵ Indeed this convention espousing the notion of global limitation, which in essence is a residual limitation regime, may well be the answer to the so far unabated problem of liability and compensation for damage caused by the use of LNG fuel. An examination of its salient features should, therefore, be in order.

Article 1 of the LLMC Convention provides that shipowners are entitled to limit their liability in accordance with the rules of the Convention. In that Article, 'shipowner' is defined as 'the owner, charterer, manager and operator of a seagoing ship'.⁴⁶ It is arguable that even though 'seagoing ship' is not defined by the Convention and its precise meaning is, therefore, left to be determined by State Parties, the term can nevertheless accommodate a ship using LNG as fuel if it is properly defined in domestic legislation to that end.

With regard to the range of claims subject to limitation under the Convention, Article 2 provides that the following claims, whatever the basis of liability may be (contractual, tortious, statutory or otherwise), are subject to limitation of liability:

- a. claims in respect of loss of life or personal injury or loss of or damage to property (including damage to harbour works, basins and waterways and aids to navigation), occurring on board or in direct connexion with the operation of the ship or with salvage operations, and consequential loss resulting therefrom

44 See Patrick Griggs, Richard Williams and Jeremy Farr, *Limitation of Liability for Maritime Claims* (LLP 2005). See also Xu (n 24) 109. The author observes that while limitation of liability was traditionally granted 'pursuant to public policy rather than by virtue of a legal right', under the present provisions of current convention regimes the onus to prove that the shipowner is not entitled to limit liability is placed on the claimant so that '[i]n effect, the privilege of limitation has been converted to a right.'

45 Griggs, Williams and Farr. *ibid* 3.

46 LLMC Convention, art 1(2).

- b. claims in respect of loss resulting from delay in the carriage by sea of cargo, passengers or their luggage;
- c. claims in respect of other loss resulting from infringement of rights other than contractual rights, occurring in direct connexion with the operation of the ship or salvage operations;
- d. claims in respect of the raising, removal, destruction or the rendering harmless of a ship which is sunk, wrecked, stranded or abandoned, including anything that is or has been on board such ship;
- e. claims in respect of the removal, destruction or the rendering harmless of the cargo of the ship;
- f. claims of a person other than the person liable in respect of measures taken in order to avert or minimize loss for which the person liable may limit his liability in accordance with this Convention, and further loss caused by such measures.

It is clear that claims subject to limitation of liability under the Convention extend well beyond pollution damage. Indeed where a claim is specifically covered by another convention(s), such as the pollution liability conventions, LLMC will not apply to it. A whole range of other claims are covered that might well prove to be relevant in the case of an incident involving LNG where, as already observed, environmental damage of the kind associated with oil spills, is unlikely to be the main concern, given the characteristics of LNG fuel.

Interestingly enough, in the absence of any specific convention dealing with damage arising from the carriage of LNG as fuel, the LLMC Convention may provide a mechanism for dealing with liability and compensation matters in connection with such damage in certain respects. However, it must be noted from the point of view of the victim that the 'conduct barring limitation' formula makes limitation virtually unbreakable; but that is the same with all other limitation conventions today. Article 4 of the LLMC provides that:

A person liable shall not be entitled to limit his liability if it is proved that the loss resulted from his personal act or omission, committed with the intent to cause such loss, or recklessly and with knowledge that such loss would probably result.

Unless the strict conditions established by this Article are fulfilled, which would rarely be the case, the shipowner retains the right to limit his liability under the Convention.

The right of the shipowner to limit liability is, therefore, virtually unshakeable, and its consequences in terms of claimants' ability to recover the full extent of their loss can be quite significant in some cases. In so far as the shipowner is concerned, the right to limit liability is most certainly of major benefit. On the contrary, limitation of liability also means that the victims will often not recover full compensation for damage suffered. It is, therefore, crucial that the shipowner's right to limit his liability must be counterbalanced by a guaranty of the victim's entitlement to whatever

compensation is lawfully due to him which would take account of the shipowner's limited liability. It is submitted that a mechanism of compulsory insurance would go a long way to balancing out the limitation of liability advantages pertaining to the shipowner by introducing an element which ensures that the victims of an incident will be adequately compensated. Indeed, compulsory insurance already exists in several domestic jurisdictions and is in the offing at IMO regardless of whether or not it is required under specific conventions.

3.3 Compulsory insurance

Before its inclusion in the CLC 1969, compulsory insurance 'was almost unheard of in international conventions'.⁴⁷ After its inclusion in the 1969 Convention, however, 'compulsory insurance has been of major importance in the development of new international law on maritime liability'.⁴⁸ While the HNS Convention was being negotiated, for instance, inclusion of compulsory insurance 'seemed to be taken for granted all along'.⁴⁹

Before dealing with the question of whether compulsory insurance is or should be a requirement for LNG fuelled ships, it is perhaps useful to look at the existing international/regional regulatory framework and to consider how this may or may not influence domestic compulsory insurance regimes. To begin with, and to clarify the existing trend, a brief analysis can be undertaken of the status of the compulsory insurance obligation under four important limitation of liability regimes. In the CLC, compulsory insurance has been a requirement since its adoption in 1969 and the rule of compulsory insurance was retained in the 1992 CLC. Under the HNS Convention, Article 12 provides that 'the owner of a ship registered in a State Party and actually carrying hazardous and noxious substances [is] required to maintain insurance or other financial security . . . in the sums fixed by applying the limits of liability prescribed [in the Convention]'.⁵⁰ Ships to which the Convention applies are required to carry on board a certificate attesting that the requirement of compulsory insurance is indeed fulfilled. Provisions relating to compulsory insurance under the Bunkers Convention are similar to those in the 1992 CLC and, once again, a certificate attesting insurance is required to be carried on board vessels covered by the Convention. Finally, it is conspicuous that the LLMC Convention breaks the pattern and makes no provision for compulsory insurance. It has been observed, however, that this omission was not the result of a decision that compulsory insurance was not necessary but rather a result of it being 'difficult to require compulsory insurance in a convention like the LLMC, where the basis of liability is not set out'.⁵¹

It has been concluded that none of the subject-specific pollution liability conventions discussed above apply to damage caused by spill of LNG as fuel; and therefore the compulsory insurance provisions of those conventions also do not apply. It is,

47 Erik Røsæg, 'Compulsory Maritime Insurance' [2000] *Scandinavian Institute of Maritime Law Yearbook* 179. For a discussion on the development of the concept of compulsory insurance see Ling Zhu, *Compulsory Insurance and Compensation for Bunker Oil Pollution Damage* (Springer 2007) 50.

48 Zhu, *ibid* 50.

49 *ibid*.

50 HNS Convention, art 10.

51 Røsæg (n 47) 2.

therefore, of vital importance that in any international convention addressing liability in respect of LNG fuelled ships, a regime of compulsory insurance must be included. In situations where domestic law applies, as exemplified below, this may already be the case.

By way of Resolution A.898(21), adopted on the 25 November 1999, the IMO issued *Guidelines on Shipowners' Responsibilities in Respect of Maritime Claims* and requested Member States to urge shipowners to comply with the contents of the said Guidelines. Article 3.1 of the Guidelines provides that '[s]hipowners should arrange for their ships' insurance cover that complies with these Guidelines.' Article 4.1 then specifies that '[s]hipowners should ensure that liability for relevant claims up to the limits set under Articles 6 and 7 of the Limitation Convention is covered by insurance.'

Guidelines being instruments *para droit*, Resolution A.898(21) is not legally binding upon states or shipowners. In this context, a number of important developments have unfolded since the adoption of the Guidelines in 1999. On 23 April 2009, the European Parliament and the Council of the European Union adopted Directive 2009/20/EC,⁵² essentially directing Member States to adopt legislation making insurance compulsory for ships of 300 gross tons and above. The rationale for the introduction of compulsory insurance is depicted in the preamble to the Directive. It is stated that compulsory insurance should ensure better protection for victims, should eliminate substandard ships and should make it possible to re-establish competition between operators. The requirement of compulsory insurance is set out in Article 4 of the Directive as follows:

1. Each Member State shall require that shipowners of ships flying its flag have insurance covering such ships.
2. Each Member State shall require shipowners of ships flying a flag other than its own to have insurance in place when such ships enter a port under the Member State's jurisdiction
3. The insurance referred to in paragraphs 1 and 2 shall cover maritime claims subject to limitation under the 1996 Convention. The amount of the insurance for each and every ship per incident shall be equal to the relevant maximum amount for the limitation of liability as laid down in the 1996 Convention.

A certificate proving that the ship has, indeed, been insured according to Article 4 needs to be carried on board every ship to which the Directive applies. The above provisions are significant in that the requirement for compulsory insurance is not only binding in respect of ships flying the flags of Member states, but also binding on shipowners of Member states who have flagged their ships out to non-EU flag states. Furthermore, the amount of insurance must be equivalent to the relevant limitation in the 1996 Convention 'for each and every ship per incident'. That is quite specific and is probably designed to prevent a shipowner from under insuring.

52 Directive 2009/20/EC of the European Parliament and of the Council of 23 April 2009 on the Insurance of Shipowners for Maritime Claims [2009] OJ L131/128

Directive 2009/20/EC was, therefore, an important development in view of the above requirements. While this will naturally result in a degree of regional uniformity, it can by no means be taken as a guarantee for compulsory insurance to be applied (or be applied in the same way) in the domestic regimes of countries outside the Union.

3.4 National examples

To better illustrate the consequences of not having an international convention setting a degree of uniformity in relation to LNG fuel liability issues, the following discussion will address the relevant rules that would apply under UK law, a common law jurisdiction, and under Chinese law, a civil law jurisdiction, respectively, in the eventuality of an LNG fuel incident occurring in waters falling under the jurisdiction of the two states.

The UK has ratified all major limitation of liability Conventions and has signed (but not yet ratified) the HNS Convention.⁵³ In the eventuality that an incident involving the use of LNG as a marine fuel occurs in an area falling under the UK jurisdiction, limitation of liability would be determined in accordance with Schedule 7 of the UK Merchant Shipping Act 1995 (UK MSA), which implements the LLMC Convention into the UK law. All claims that may be subject to limitation of liability under the LLMC Convention may, therefore, also be subject to limitation of liability under the UK law. Generally stated, according to Article 6 of Schedule 7 of the UK MSA, the following limits of liability apply:

- a. in respect of claims for loss of life or personal injury,
 - i. 2 million Units of Account for a ship with a tonnage not exceeding 2,000 tons,
 - ii. for a ship with a tonnage in excess thereof, the following amount in addition to that mentioned in (i):

for each ton from 2,001 to 30,000 tons, 800 Units of Account;
 for each ton from 30,001 to 70,000 tons, 600 Units of Account; and
 for each ton in excess of 70,000 tons, 400 Units of Account,

- b. in respect of any other claims,
 - i. 1 million Units of Account for a ship with a tonnage not exceeding 2,000 tons,
 - ii. for a ship with a tonnage in excess thereof the following amount in addition to that mentioned in (i):

for each ton from 2,001 to 30,000 tons, 400 Units of Account;
 for each ton from 30,001 to 70,000 tons, 300 Units of Account; and
 for each ton in excess of 70,000 tons, 200 Units of Account.

53 Main domestic law of relevance is the Merchant Shipping Act 1995.

Insofar as compulsory insurance is concerned, in the UK, Directive 2009/20/EC was incorporated into domestic law in terms of the Merchant Shipping (Compulsory Insurance of Shipowners for Maritime Claims) Regulations 2012.⁵⁴ According to Regulation 4(1), a UK ship may not enter or leave a port in the UK or elsewhere unless the shipowner has insurance in respect of that ship. According to Article 4(2), a ship which is not a UK ship may not enter or leave a port in the UK unless the shipowner has insurance in respect of that ship.

A correlation is made with the LLMC Convention, given that under Regulation 4(3) 'insurance must cover at least maritime claims subject to limitation under the 1996 Convention'.⁵⁵ Moreover, under Regulation 4(4) of the Merchant Shipping Regulations 2012 '[t]he amount of insurance for each and every ship per incident must be at least equal to the relevant maximum amount for the limitation of liability as laid down in the 1996 Convention'.⁵⁶

In the People's Republic of China (PRC), the relevant pieces of domestic legislation are the Maritime Code of the PRC⁵⁷ and the Regulations on Administration of Prevention and Control of Pollution to the Marine Environment by Vessels (the 'Chinese Regulations').⁵⁸ Under the Regulations, if the pollution damage is caused by persistent cargo oil or bunker oil spilled from a laden tanker or a tanker on ballast water with residues on board, the limitation of liability regime of the 1992 CLC applies. Given that the PRC is not a party to the LLMC Convention of 1976 or its Protocol of 1996, for any other pollution damage (including damage emanating from the utilisation of LNG as a marine fuel), the limitation of liability regime in the Maritime Code of the PRC applies. Generally stated, according to Article 210 of the aforementioned Code, the following limits of liability apply:

1. In respect of claims for loss of life or personal injury:
 - a. 333,000 Units of Account for a ship with a gross tonnage ranging from 300 to 500 tons;
 - b. For a ship with a gross tonnage in excess of 500 tons, the limitation under a) above shall be applicable to the first 500 tons and the following amounts in addition to that set out under a) shall be applicable to the gross tonnage in excess of 500 tons:

For each ton from 501 to 3,000 tons: 500 Units of Account;

For each ton from 3,001 to 30,000 tons: 333 Units of Account;

For each ton from 30,001 to 70,000 tons: 250 Units of Account;

54 SI No 2267/ 2012. Hereinafter referred to as The Merchant Shipping Regulations 2012.

55 *ibid*, reg 4(3).

56 *ibid*, reg 4(4).

57 Adopted at the 28th Meeting of the Standing Committee of the Seventh National People's Congress on 7 November 1992, promulgated by Order No 64 of the President of the People's Republic of China on 7 November 1992, and effective as. See <<http://english.mofcom.gov.cn/aarticle/lawsdata/chineselaw/200211/20021100050726.html>> accessed 30 November 2016.

58 For an overview of the Regulations on Administration of Prevention and Control of Pollution to the Marine Environment see: Jingjing Xu, 'The Regulations of the People's Republic of China on Administration of Prevention and Control of Pollution to the Marine Environment by Vessels: A General Overview' (2012) 18 *Journal of International Maritime Law* 75.

For each ton in excess of 70,000 tons: 167 Units of Account.

2. In respect of claims other than that for loss of life or personal injury:
 - a. 167,000 Units of Account for a ship with a gross tonnage ranging from 300 to 500 tons;
 - b. For a ship with a gross tonnage in excess of 500 tons, the limitation under a) above shall be applicable to the first 500 tons, and the following amounts in addition to that under a) shall be applicable to the part in excess of 500 tons:

For each ton from 501 to 30,000 tons: 167 Units of Account;

For each ton from 30,001 to 70,000 tons: 125 Units of Account;

For each ton in excess of 70,000 tons: 83 Units of Account.

Not only is it evident that, when compared with the UK law, the limits of liability are lower under the Chinese law; it is also clear that the requirement for compulsory insurance under the Chinese domestic law is considerably more lenient than what applies under the UK law. Article 53 of the Chinese Regulations dictates that all ships trading within the sea areas under the jurisdiction of the PRC, except those less than 1,000 gross tonnage used for the carriage of cargo other than oil, shall maintain insurance or other financial security no less than the sums fixed by applying the limitation of liability prescribed in Article 52 of the same Regulation to cover liability for pollution damage. According to Article 52, liability for pollution damage resulting from ship-source pollution incidents needs to be determined in accordance with the relevant provisions of the Maritime Code of the PRC. A quick glance at Article 210 of the Chinese Maritime Code is enough to surmise that considerably lower limits apply than is the case, for instance, under equivalent UK legislation. Moreover, the requirement of compulsory insurance under Article 53 of the Regulations of the PRC on Administration of Prevention and Control of Pollution to the Marine Environment by Vessels applies only in relation to liability for pollution damage. Other types of liability that may well arise in the aftermath of an incident relating to the use of LNG as a marine fuel would not be covered by the same compulsory insurance requirement.

It is evident that by requiring the adoption of legislation to make insurance compulsory for ships of 300 gross tons and above, Directive 2009/20/EC has enabled the achievement of some level of uniformity within the EU. While this Directive has undeniably exerted a positive impact, it is limited to the EU region. Furthermore, even with respect to that region, varying implementations of the Directive as well as the 1996 LLMC Convention in different states may ultimately result in a lesser degree of uniformity than what may have been perceived initially. The situation becomes even more unpredictable when jurisdictions outside the EU are considered. Whereas China does have its own (admittedly limited) compulsory insurance requirement in place, that may not be the case with other jurisdictions. Until international legislation laying down a rule of compulsory insurance *vis-à-vis* ships utilising LNG as a fuel is adopted, national authorities would do well to adopt domestic

legislation similar to that requested of EU Member States by Directive 2009/20/EC. There is now perhaps a pressing need for the international community to take action and adopt a widely applicable requirement of compulsory insurance with regard to ships utilising LNG as a fuel for their propulsion. This would serve to ensure the widest possible application of the compulsory insurance requirement and a greater degree of uniformity in its definition.

4. PROPOSAL FOR A NEW INTERNATIONAL REGIME

Just as the Bunkers Convention filled the gap left by the CLC Convention relating to liability arising from bunker oil pollution damage, another initiative now needs to be taken by the international community in respect of liability in connection with damage arising from spills of LNG fuel. This initiative must address the conspicuous gap left by the HNS Convention, which deals with liability arising from damage caused by hazardous and noxious substances when carried as cargo, or as residue from a previous carriage in bulk, but not apply to hazardous and noxious substances such as LNG when carried as bunker fuel. Following the adoption of the Bunkers Convention, former IMO Secretary-General Mr. William O'Neil commented that:

The adoption of a bunkers convention completes the task initiated by the Legal Committee when it was established by IMO more than 30 years ago—namely, the adoption of a comprehensive set of unified international rules governing the award of prompt and effective compensation to all victims of ship-sourced pollution.⁵⁹

While the adoption of the Bunkers Convention definitely served to close a major gap in the international legal framework for pollution liability, it appears that with the increased use of LNG as a marine fuel, another new gap has emerged that needs closing.

Within the current framework and without abandoning the established regimes, a number of potential courses of action can be envisaged, all with their respective advantages and disadvantages.⁶⁰ The first option would be to adopt a new international convention that deals exclusively with LNG when used by a ship as bunker fuel, much in the same way as the Bunkers Convention deals exclusively with damage caused by bunker oil. A second option would be to amend the HNS Convention by extending its definition of hazardous and noxious substances to cover hazardous and noxious bunker fuels (including LNG) that are not covered by the Bunkers Convention or any other regime. Yet, another option would be to extend the scope

59 See <http://www.imo.org/blast/contents.asp?topic_id=67&doc_id=457> accessed 30 November 2016.

60 *ibid.* The international community was faced with similar choices before the adoption of the Bunkers Convention, when a decision needed to be taken on whether to extend the scope of the CLC regime or HNS Convention or to adopt a separate convention to deal with oil pollution from ships' bunkers. It was considered at the time that to include bunker pollution in the scope of the CLC regime would complicate matters since there was a clear difference between oil carried as cargo and bunker fuel oil. Bunkers were also left out of the HNS Convention but with the firm understanding of several delegations that a bunkers convention would be developed at the earliest possible opportunity thereafter.

of the Bunkers Convention to cover the use of LNG as a marine fuel. Whichever of these three courses of action is selected, three major questions need to be addressed in the process of developing a regime for governing liability associated with the use of LNG as a marine fuel:⁶¹ What should be the basis of liability? Who should be liable? Should liability be limited?

These three points were all addressed in the respective drafting processes of the existing pollution liability conventions discussed above, and will once again need to be considered in the adoption of a liability regime for use of LNG as a marine fuel. In so far as the first question is concerned, the CLC, HNS and Bunkers Conventions all have a regime of strict liability. The claimant need not prove fault on the part of the polluter, he simply needs to prove that he suffered pollution damage as defined by the respective Conventions. This differs from the situation under the traditional law of tort or delict, where to be successful the claimant must prove that the damage suffered was proximately caused by the defendant's fault or negligence.⁶² Also, all these conventions provide for exceptions to the strict liability rule, and in that respect the exceptions are similar. Notably, there is no liability under any of the Conventions if the person liable proves that the damage resulted from an act of war; or was wholly caused by an act or omission done with intent to cause damage by a third party; or was wholly caused by the negligence or other wrongful act of any Government or other authority; or was wholly or partially (in which case exemption from liability is also partial) resulted from an act or omission done with intent to cause damage by the person who suffered the damage or from the negligence of that person.⁶³

Strict liability differs from absolute liability in that, virtually no exceptions are available in the latter regime. By contrast, in strict liability, if any of the listed exceptions applies, the shipowner is exonerated from liability.⁶⁴ In the eventuality that the international community moves for the adoption of liability rules to govern LNG fuel-related incidents, a decision will have to be taken on whether strict or absolute liability should apply. Incidentally, absolute liability in maritime law only applies in the so-called Nuclear Convention.⁶⁵ In all likelihood, the regime of strict liability will prevail. While it is beyond the scope of the present article to consider in detail the benefits and disadvantages to such a system, it suffices to point out that a rationale for imposing strict liability is to ensure protection to and provide compensation for potential victims.⁶⁶

61 See Xu (n 24) 108.

62 *ibid.*

63 In this regard, see art 3(2) of the CLC Convention, art 7(2) of the HNS Convention and art 3(3) of the Bunkers Convention.

64 Jingjing Xu, 'The Law And Economics Of Pollution Damage Arising From Carriage Of Oil By Sea' (2009) 36 *Maritime Policy & Management* 309.

65 'The Convention on the Liability of Operators of Nuclear Ships' 57 *American Journal of International Law* 268 (1962) provides in art II para 1 that 'The operator of a nuclear ship shall be absolutely liable for any nuclear damage upon proof that such damage has been caused by a nuclear incident involving the nuclear fuel of, or radioactive products or waste produced in such ship'.

66 For a detailed discussion of the main reasons for the introduction of strict liability with regard to oil pollution incidents see Zhu (n 47) 90 onwards. Zhu makes the point that while it is evident that a regime of strict liability facilitates victims' claims, the argument that strict liability provides an additional incentive to improve prevention of ship-source marine pollution is somewhat dubious. Indeed some contend (to the contrary) that fault-based liability provides a better incentive.

While the adoption of a strict liability regime does provide a better level of protection for potential victims, if the shipowner lacks adequate resources to make good the damage suffered, the advantages associated with a strict liability regime quickly dissipate. A potential solution to this problem is the adoption of a compulsory insurance requirement, which in fact subsists in all the pollution liability conventions discussed above. The essence of compulsory insurance is the obligation of the shipowner to show evidence of financial security to cover his liability. A decision would need to be taken on whether to make the compulsory insurance requirement applicable to all LNG fuelled vessels or to vessels exceeding a certain tonnage.⁶⁷

In relation to the second of the three major questions regarding who should be liable, during the drafting of some of the liability conventions this was a point of contention.⁶⁸ Given the precedents already established in the previous pollution liability conventions, it is almost without doubt that in the first instance it will be the shipowner. However, the question will remain whether the owner of the fuel should also bear responsibility. For cases where the shipowner is the owner of the fuel, appropriate adjustments will have to be made in the apportionment of compensation in terms of liability as shipowner and liability as owner of the fuel. Whether the shipowner should remain fully liable where it is not the owner of the fuel, such as where a bareboat charterer owns the fuel, is another issue to be considered. The definition of 'shipowner' could be kept broad enough to encapsulate an operator or bareboat charterer, same as in the Bunkers Convention.

The final question concerns the limitation of liability. The concept of limitation is so entrenched in shipping law that the right of the shipowner to limit liability in any new convention will be a foregone conclusion. The question simply would be whether it should be based on minimum carriage (as in the CLC Convention) or on minimum gross tonnage of the ship (as in the Bunkers Convention), or whether the model of the HNS Convention should be adopted. The latter would be undesirable in view of the uncertainty engendered by the lack of any definitive parameters on which limitation can be based. Regarding limitation, the limits established by existing conventions with regard to other pollutants would not necessarily be valid for LNG fuel-related incidents. Among other things, the limitation regime should be tailor-made to fit the peculiarities of LNG fuel.

Any new convention, if that option is pursued, would share with the HNS Convention the same relationship as the Bunkers Convention does with the CLC. Needless to say, provision should be made for compulsory insurance meeting at least the limits established by the new convention obviating the need for compatibility or integration with an existing convention. The main disadvantage of launching a new convention is that negotiations would have to be started from the beginning and the whole process of reaching agreement would be greatly time-consuming, more so than if an existing convention were to be amended. By contrast, the obvious advantage associated with amending an existing Convention is that it would already be in

67 Under art 7(1) of the Bunkers Convention, for instance, only ships with a gross tonnage greater than 1,000 are required to maintain insurance.

68 The drafting process of the 1969 CLC Convention constitutes a clear example. See Xu (n 24) 108.

effect; only specific amendments would be needed.⁶⁹ If the Bunkers Convention were to be amended, most likely difficulties would be faced given that the convention has already gained widespread support. The introduction of an alien element into what is a very subject-specific convention dealing exclusively with bunker oil would probably be viewed with reluctance by State Parties who may be unwilling to alter the dynamics of a Convention that is in already in place and functions rather well. Amending the Bunkers Convention may not, therefore, be the best course of action.

Amending the HNS Convention may well be a better option. An obvious advantage is that the notion of damage in this convention already addresses hazardous and noxious substances, in general. In that Convention, LNG is recognised as a hazardous and noxious substance; thus a relatively minor amendment may be enough to insert LNG bunker fuel within the Convention's remit. This could be done in a relatively easy manner by introducing a new paragraph (c) to Article 1(5)⁷⁰ to lay out that the phrase 'hazardous and noxious substances' covers also (for the purpose of the Convention) 'liquefied gases as defined in Article 1(5)(a)(v) when used or intended to be used for the operation or propulsion of the ship and residues of such gasses'. Of course, consideration must be given to whether the HNS Fund should be available for damage caused by LNG fuel. There appears to be no insurmountable reason as to why this should not be possible and, provided that such an extension is made, the cost of compensation payments arising from damage caused by incidents related to the use of LNG as a marine fuel would fall to be covered by the LNG account of the HNS Fund.⁷¹ Also, due consideration will need to be given to the question of how best to determine the aggregate amount to which liability may be limited insofar as incidents related to the use of LNG as a marine fuel are concerned.⁷² Another 'bonus' in this regard is that once limits of liability are fixed, Article 12 of the HNS Convention already makes it mandatory for ship owners registered in State Parties and actually carrying hazardous and noxious substances to maintain insurance or other financial security in the sums fixed by applying the relevant limits of liability. All in all, therefore, and given that the HNS Convention is not yet in force,⁷³ the Convention framework seems to be adequate for the incorporation of the minor

69 Presently, art 1(9) of the Bunkers Convention defines pollution damage as 'loss or damage caused outside the ship by contamination resulting from the escape or discharge of bunker oil from the ship ...' This would need to be amended and made to incorporate also any discharge of LNG bunker fuel.

70 art 1(5) of the HNS Convention defines the phrase 'Hazardous and Noxious Substances' and, as such, effectively determines the scope of application of the HNS Convention.

71 In terms of art 19 *bis* (a) of the HNS Convention, annual contributions to the LNG account shall be made by any person who in the preceding calendar year was the receiver in a State Party of any quantity of LNG. In certain situations covered by art 19 *bis* (b), contributions must be made by the person who, immediately before its discharge, held title to an LNG cargo discharged in a port or terminal of the state in question.

72 Presently, the limits of liability established by the HNS Convention are considerably higher than the global limits established by the LLMC Convention. When determining the aggregate amount to which liability may be limited, art 9 distinguishes between (1) incidents where the damage has been caused by bulk HNS and (2) incidents where the damage has been caused by packaged HNS, or where the damage has been caused by both bulk HNS and packaged HNS, or where it is not possible to determine whether the damage originating from that ship has been caused by bulk HNS or by packaged HNS.

73 By way of contrast, it is perhaps pertinent to point out that the CLC Convention was already in force when the Bunkers Convention started to be contemplated.

amendments necessary to make it applicable to incidents arising from the use of LNG as a marine fuel.

Whichever course of action is chosen, it is crucial that the international community moves for the adoption of rules to govern liability issues related to the use of LNG as a marine fuel. Failure to do so may well lead states to adopt their own liability regimes to deal with incidents involving LNG use as a marine fuel. Before the introduction of the Bunkers Convention, for example, a number of coastal states had already adopted legislation governing potential bunker-oil pollution liability issues.⁷⁴ Such unilateral actions by states is manifestly undesirable as this could very well expose shipowners to divergent domestic laws and create yet another element of uncertainty that will impede the use of LNG fuel as a market-driven necessity.

5. CONCLUDING REMARKS

Intent on reducing the environmental impact of the shipping industry, in 2008 the international community boldly opted to adopt considerable restrictions on the sulphur content of marine fuel. LNG marine fuel proved to be one of the alternatives open to shipowners seeking to comply with these new limits and indications are that the increased use of LNG marine fuel will continue to gain momentum as stricter limits eventually enter into force over the coming years and as bunkering infrastructure improves. While the increased use of LNG marine fuel is a positive improvement from an environmental point of view, it has also brought into the forefront a number of challenges to the shipping world. In so far as the development of safety regulations is concerned, both with regard to LNG-fuelled ships as well as the bunkering process, it can be observed that progress has been and continues to be made. The same cannot be said in reference to potential civil liability issues that may arise following an incident related to the use of LNG as a marine fuel. As has been observed in this article, there is no existing international convention that deals specifically with these issues; neither is there any liability convention covering the use of LNG as a marine fuel. The international community must move swiftly on this front if the proliferation of diverse national regimes is to be avoided.

While it is understandable that the use of LNG as a marine fuel has only recently started to gain momentum, the fact that no liability regime is in the pipeline is lamentable. It is important to ensure that adequate technical regulations are in place to guarantee the safe use of LNG as a marine fuel. However, accidents do happen and such eventualities must not be discounted. In such instances, liability issues will invariably arise and, in the absence of an international regime, domestic law will inevitably assume an important albeit perhaps a less than desirable role in respect of claims. The legal fragmentation and uncertainty that such an arrangement can engender will not be in the best interests of victims as claimants and will not be conducive to the advancement of world shipping as a whole and the related industries.

74 See Zhu (n 47) 15. Zhu observes that the United Kingdom extended the CLC regime to bunker spills so as to rectify the inequity between liability imposed on tankers and non-tankers. The USA adopted a piece of legislation dealing with oil pollution from all types of vessels. On the contrary, many countries did not adopt domestic legislation to this effect.