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Carriage of hazardous materials (HM) by sea and the right of innocent passage: states disputes and environmental concerns

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Abstract

In recent years, the increasing carriage of HM by sea has already leaded to one of the major disputes between coastal and flag States. This is because of the potential damage to the marine environment and the socio-economic aftermath. Furthermore maritime accidents (e.g. M/T Ievoli Sun, M/T Prestige) and experiments at sea (e.g. M/V Cape Ray's mission and the Syrian Chemical Weapons transportation by sea) introduce extraordinary sea threats. The need to better sea environmental protection will result increasing conflicts among States. In one sense this dispute is thrilling and signals the emergence of new treatment ideas, while in another designates that there is no agreement over how shipping community should proceed to tackle it. The fact is that while the coastal States claim as to the obligation to protect their territorial sea and especially the marine environment, the flag States invoke the right of innocent passage keeping the carriage of HM by sea in the limelight, even if these concepts have been codified in UNCLOS 1982.This new visibility calls for a recalibration of the balance between navigation and environment.

JEL Classification: K32, R41, Q53.
Keywords: Sea transport, Hazardous materials, Innocent passage, Environmental Law.

1. Introduction

This study aims to examine the contemporary status of the hazardous materials (HM) transportation by sea and the exercise of the right of innocent passage according to the United Nations Convention on the Law of the Sea (UNCLOS, 1982) from the perspective of coastal State and flag State. The time is ripe for analyzing the deficiencies and deadlocks of freedom of navigation which seems to be the subject to ships of all States, carrying hazardous materials in contrast to the right of coastal States to protect their territorial sea under the existing institutional framework. The legal arguments and policies of those States will be evaluated in order to identify the prevalent trends in the international shipping.

Flag States make clear that ships enjoy the right of innocent passage, based in UNCLOS 1982, so long as it is not prejudicial to the peace, good order or security of the coastal State. Nevertheless, subject to the Law of the Sea, coastal States exercise their sovereignty beyond its land territory and internal waters to an adjacent belt of sea, described as the territorial sea. Therefore, while the coastal States claim as to the obligation to protect their territorial sea and especially the marine environment, the flag states invoke the right of innocent passage leading the hazardous materials transportation by sea to be a field of intense debate between the parties and shipping stakeholders. These concepts, even if they have been codified in UNCLOS 1982, continuing to raise disputes among the parties involved; keeping the issue of hazardous materials transportation by sea in the focus of international shipping attention.

The objective of this paper is to highlight the need for implementing an effective policy on beneficial dialogue with pertinent stakeholders so as to resolve the issue. Particular attention should be paid to any ameliorative solution does not affect the light of the guidelines of freedom of navigation as provided for in UNCLOS 1982. The legal boundaries of regulatory framework for HM carriage by ships are investigated. This is mainly done by reflecting on the relevant international conventions; recent developments on innocent passage and environmental protection. Although legislative initiatives can protect the marine environment, in terms of HM carriage by ships they cannot resolve the aforementioned conflict between coastal and flag States.

2. Literature Review

In a very early stage, States perceived the importance of safe transport by sea, the proper handling of hazardous materials and the socio-economic impacts from environmental damage. It is worth mentioning the case of SS Mont Blanc (transported war explosives) and SS IMO which involved in a collision (Halifax Explosion, 1917). The dangerous load of Mont Blanc exploded in the port of Halifax (Canada) caused the death of many people and property destruction. Needless to say the well-known cases of tankers Ievoli Sun (2000), Prestige (2002) and the recent motor vessel Cape Ray's mission and the Syrian Chemical Weapons transportation in the Mediterranean Sea (2014). The HM transportation by sea can generate serious damages in all aspects of life and the matter engages the coastal, flag States and the international shipping itself.

It should be noted that some coastal States strongly reacted when ships loaded with HM entered in their territorial sea and others refused to grant the right of innocent passage to such purpose ships without their permission (UN, 2013). The carriage expansion of HM's by sea through national jurisdiction results in conflicts between coastal and flag States. Specifically, the right of merchant ships to sail in the territorial sea, even has long been an accepted principle in the UNCLOS 1982, is blurred especially when cope with the meaning of "ships' innocent passage" (Evans, 2014; Shaw, 2014; Harrison, 2013; Nixon, 2013; Tanaka; 2012). Territorial sea (sovereign territory of the State) is a belt of coastal waters extending at most twelve nautical miles from the baseline of a coastal State (Articles 2-3 UNCLOS, 1982).World States

have not adequately regulated the institutional framework for the carriage of HM by ships. This gap thoroughly reflect the debate of flag and coastal States on potential refusal of passage, through the territorial sea, to ships carrying hazardous materials cargoes because coastal States invoke the right of prior notification and flag States are not willing to announce the ship's route due to potential terrorist attack. Such an attack will be catastrophic not only for the coastal State's marine environment but for its economy.
Coastal States, in the territorial sea have full jurisdiction with a limitation in the exercise of right of innocent passage by ships (art. 17 UNCLOS 1982). However, Coastal State cannot hamper innocent passage except in certain circumstances (art.19 UNCLOS 1982) but can enforce regulations in respect of safety of navigation and environmental protection. Some coastal States deny the right of innocent passage in order to secure their territorial sea, claiming the doctrine of precautionary principle (Birnie et.al 2009). Other States prohibits the exercise of the right of innocent passage in HMs' ships even through the Exclusive Economic Zone which is an area extending two hundred nautical miles from the shore's base line (Evans, 2014; Kraska, 2011). This conflict between coastal and flag States is about security and environmental concerns (Basel Convention, 1989).

This situation seems to be a deadlock between the States; and the international community is concerned because coastal States raise questions about the environmental impact of hazardous materials. But the flag States seek to ensure the uninterrupted sea carriage of HM by claiming the right of innocent passage, according to United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS, 1982). The right of innocent passage (Art. 17 UNCLOS, 1982) allows ships flying foreign flags to pass through the territorial sea of coastal States and is in favour of freedom of navigation. The question is about the meaning of the term "innocent"(Shaw, 2014; Nixon, 2013; Tanaka, 2012; Kraska, 2011; Rothwell, 2010). So, there is a gap in the rule making of the innocent passage for ships carrying HM because the objective features of this right are not clear.

Differing opinions on the matter are causing the conflict between coastal and flag States which lie in the provisions of international law concerning the rights and obligations of those States but also in protecting the marine environment. Coastal States also make reference to security issues; because flag States retain hazardous materials transportation by sea secret and claim the controversial argument that they thereby avoid any terrorist or pirate attacks. This is, in case of accident, the coastal States would suffer dire environmental and socio-economic consequences. Also, scientific interest in this issue shows the position of States, which combine the claims of flag and coastal States and is particularly valuable to fix the *modus operandi* of the authorities in handling such a case that may be the subject of further study.

This effort aims to develop an understanding of the legal theory of HM's carriage by sea, highlighting the need to explore different dimensions of the issue at stake. An important aspect of this is the positions of States in the conduct of maritime transport of hazardous materials and the appropriate solutions to bridge any disagreements arise. By identifying the relevant regulatory legislative field covered the move of such shipments by ship; but also the right of innocent passage in conjunction with the right to protection of the marine environment it may be possible to discern shipping community needs and the means to realize them. Before proceeding to the analysis in

question, it is appropriate to define the hazardous materials - goods which are a key component of this study.

3. Hazardous Materials – Goods. Basic Definitions and Categories

It is known that a great increase in the production and distribution of HM substances observed nowadays almost universally. With more than one hundred thousand chemical compounds used today in manufacturing industry, it is estimated that only in the field of organic chemicals produced approximately six times greater quantity than 20 years ago. A large part of these transported by sea because is more economical and efficient mode of transport. The mandatory application of the International Maritime Dangerous Goods Code, known as the IMDG Code began on January 1, 2004 and contained in Ch.VII SOLAS 1974. The fact is that the vast majority of cargoes transported by sea have properties that make them dangerous to the marine environment (IMO, 2014).

A HM (hazardous material) is "*any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors*" (IHMM, 2013). The U.S. Department of Transportation (DOT) defines a hazardous material as "*any item or chemical which, when being transported or moved, is a risk to public safety or the environment, and is regulated as such under the: Hazardous Materials Regulations (49 CFR 100-180); International Maritime Dangerous Goods Code*". In other words, HM are certain items which due to their substances; qualify conditional harm to the environment and means of their shipping.

In particular, HM transported by ships may become dangerous goods, which according to *The Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997*, are classified "*in the IMDG Code or in any other IMO publication referred to in these Regulations as dangerous for carriage by sea, and any other substance or article that the shipper has reasonable cause to believe might meet the criteria for such classification*". The dangerous goods as adopted by the International Maritime Dangerous Goods (IMDG) Code are shown in appendix 1.

Today however, the use of the IMDG Code has been extended throughout the supply chain, transport and storage of hazardous materials from producers to consumers. The dangerous goods to be loaded on board or unloaded from ships and land located in port areas, must comply with the applicable provisions concerning classification, packaging, marking, stacking by special cargo compatibility rules and general handling lying and emergency response actions facts. It is certain, however, that as the industry develops new materials with hazardous properties the IMDG Code will evolve to ensure the utmost safe and environmentally acceptable shipping conditions on board.

4. Innocent Passage – Marine Environment Protection

As already mentioned, the right of innocent passage has become a serious and controversial issue between flag and coastal States due to the shipping of HM. The

controversy lies in regard to the interpretative approach of the concept innocent passage as it is defined by UNCLOS 1982. Further down set the scene for the rest of the study by analyzing the codified principles of international law; the right of innocent passage of ships and the obligation to protect the marine environment.

4.1 Flag States – The Right of Innocent Passage

The coastal State may take measures in its territorial sea to prevent passage of ships carrying HM but this action does not serve the State of play. "*Passage is **not** innocent so long as it is prejudicial to the peace, good order or security of the coastal State. Such passage shall **not** take place in conformity with this Convention and with other rules of international law*" (Art. 19 UNCLOS 1982). Again there is no clear framework because passage is not innocent only if it threatens peace, good order and security, and not when the foreign ship conforms to the laws of the coastal State.

The right of innocent passage is not limited by the flag, cargo or ship type. All ships indiscriminately are allowed to travel through the territorial sea of all States. According to UNCLOS 1982 the ship should be involved in one of the activities referred to in Article 19 (2) to consider the voyage not innocent. The HM transportation by ships through the territorial sea of a coastal State is not shown in article 19. Therefore, this passage should be allowed. According to article 19 (2h)"*any act of willful and serious pollution contrary to this Convention*" can be applied to ships transporting HM. But this point is about deliberately pollution and not accidental (Tanaka, 2012; Churchill and Lowe, 1999). So, this rule does not preclude the innocent passage of ships with HM. Another argument of coastal States against ships carrying HM through their territorial sea is also the provisions of Article 23 (*Foreign nuclear-powered ships and ships carrying nuclear or other inherently dangerous or noxious substances)* of UNCLOS 1982.

Furthermore, flag States invoke article 302 (Disclosure of information) of UNCLOS 1982 in order to strengthen their position. They argue that ships carrying HM through territorial sea of coastal State cannot give detailed passage plan to local authorities because of the right of privacy. If the route of ship transporting such loads is known there will be fears of terrorist or pirate attack. In modern times this risk has been repeatedly shown to exist.

4.2 Coastal States - The Right and Duty of Innocent Passage

Some coastal States point out that they should be informed (prior notification) of the passage of ships carrying HM through their territorial sea and authorized accordingly. This position is justified by the uncertain safety situation of those shipments condition. There could be also cases where activists easily boarded such ships and this shows the size of their exposure to a potential scenario occupation by pirates or terrorists. Ultimately emerges the issue of civil liability after they have been incidents where the insurance company or shipping company is not contributing as they should, to restore the environment after the accident (Mandaraka-Sheppard, 2013). This practice does not encourage coastal States to grant the right of innocent passage.

However, under the Article 17 (Right of innocent passage) UNCLOS 1982 observed a broad enjoy of the right of innocent passage through the territorial sea to ships of all States. However, the coastal State has legislative and executive jurisdiction within its territorial sea and may adopt legislative framework in line with Article 21 (Laws and regulations of the coastal State relating to innocent passage) UNCLOS 1982. In theory, coastal State has full executive power within its territorial sea but cannot impose its authority in all cases. When a ship conspires against peace within the territorial sea, the coastal State shall take measures to restore order.

In fact, Article 220 (2) (Enforcement by coastal States) UNCLOS 1982 is a special rule where coastal State may detain a ship responsible for pollution in its territorial sea. Under this article the coastal State may take measures in case ships carry HM even when the ships exercise the right of innocent passage. It appears that the provisions of UNCLOS 1982 create limitations on the right of absolute sovereignty of the coastal State over its territorial waters and the same happens when ships carry HM.

4.3 Coastal States - The Right of Prior Notification

Regarding to the right of prior notification, States categorized into five groups (Table 1), each of which expresses a particular position to the transport of HM and interprets differently the UNCLOS 1982 (Hakapää and Molenaar, 1999). Most member groups (B, C, D, E), belonging to developing economies without large merchant fleet, call for a more rigorous approach to the right of innocent passage while other and especially group A (mostly developed economies) are opposed to the said position. It is drawn that the international shipping community is not ready to create a balanced global solution so as to reconcile the differing treatment of States on the issue. However, the need to define a clear common framework regulating the right of prior notification among States will be beneficial for international sea trade.

Table 1

Coastal State rights over ships carrying hazardous cargoes				
A: Oppose both	**B**: Ambiguous	**C**: Prior notif.	**D**: Prior author.	**E**: Prohibition
Germany	Colombia	Canada	Egypt	Argentina
Italy	Ecuador	Djibouti	Guinea	Haiti
Japan	Mexico	Libya	Iran	Ivory Coast
Netherlands	Uruguay	Malta	Malaysia	Nigeria
Russian Fed.		Pakistan	Oman	Philippines
Singapore		Portugal	Saudi Arabia	Venezuela
Thailand		United Arab	Turkey	
UK			Yemen	
USA				

Source: (Hakapää and Molenaar, 1999)

4.4 Marine Environment Protection

Several coastal States indicate that ships carrying HM are a threat to the safety of the seas and the coastal environment because of the extremely dangerous nature of such loads, and therefore these ships should not deserve the right of innocent passage. Coastal States have the obligation to protect the marine environment (Article 94, UNCLOS 1982) under which they should take all necessary measures to prevent, reduce and control pollution of the marine environment. Therefore, the coastal States shall have the right to stop the passage of HM transportation through their territory where it is required to protect the marine environment (Churchill and Lowe, 1999).

Nevertheless, coastal States should provide a port of refuge to vessels in distress which exercise the right of innocent passage. Even though, UNCLOS 1982 does not exactly rule this issue, a ship in case of force majeure has the right to stop and anchor in the territorial waters of coastal State (article 18.2 UNCLOS 1982). At the same time coastal State should protect its marine environment (article 194, 225 UNCLOS 1982. This is about a States' dispute over the obligation of coastal State to grant access to ship in distress in its ports and preserve human life or deny entrance due to the environmental implications. That is why coastal States require prior notification when a HM ship, which exercises the right of innocent passage, enters their territorial waters.

The right of innocent passage is a rule of international law with great acceptance among States. Under the UNCLOS 1982 there is no explicit requirement for the right of prior notification in the transportation of HM. The States claim this right and in some cases deny the right of ships to carry such loads through their jurisdictions. The controversy raises the point that the UNCLOS 1982 recognizes both the sovereign right of the coastal State over its territorial sea and the right of innocent passage of foreign ships into the marine area. It is observed that the problem lies with the coastal States as more and more bilateral or regional agreements allow the coastal State to intervene in the implementation of the right of innocent passage.

5. Regulatory Framework for HM Carriage by Ships

But for their substance itself; Hazardous materials transportation by sea becomes dangerous because of their exposure to risks arising from the sea environment itself; adverse weather conditions; damage to the load and leakage into the sea. The risks associated with the transportation of HM by sea at international level has established a range of contractual texts, the key of which are described in Table 2, in order to safely transport of HM and protect the marine environment.

Table 2

No	Contractual Texts Relevant to (HM) Hazardous Materials Transportation by Sea	
1.	UNCLOS 1982	Art.21,22,23
2.	SOLAS 1974	Chapter VII Part A-D
3.	IMDG Code	Class 1-9
4.	INF Code	Class INF1-2-3
5.	MARPOL 73/78	Annex III
6.	BASEL 1989	Annexes I-IX
7.	HNS, 1996	International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea 1996
8.	Paris Convention, 1960	Paris Convention on Third Party Liability in the Field of Nuclear Energy
9.	IAEA	Code of Practice
10.	Nuclear, 1971	Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material
11.	Vienna, 1963	Vienna Convention on Civil Liability for Nuclear Damage
Regional		
1.	Bamako, 1991	Bamako Convention on the ban on the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa
2.	Barcelona, 1975	Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution

Source: (Authors)

Especially for nuclear loads, international nuclear liability regime is governed by (i) Vienna Convention 1963 on Civil Liability for Nuclear Damage as amended in 1997 and (ii) Paris Convention 1960 on Nuclear Third Party Liability which has been amended by various protocols and supplemented by the Brussels Convention 1963 (iii) Nuclear Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material 1971. On the merits, these Conventions contain similar principles.

5.1 United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS 1982)

The UNCLOS 1982 provides special rules for ships carrying HM, nuclear or other inherently dangerous or noxious substances and also regulates the right of innocent passage. These ships when exercising the right of innocent passage must carry the relevant documents and observe special precautionary measures established by the relevant international legal framework. The aforementioned provisions set out in Article 23 of UNCLOS 1982 also refer to other international agreements relating to the safe transport of dangerous cargoes such as International Maritime Organization (IMO) conventions. Article 23 complements Article 22 (2) of UNCLOS 1982 regarding the use of sea lanes and traffic separation schemes for those special purpose ships (Tanaka, 2012). It seems that under the provisions of UNCLOS 1982, the coastal States may not impede the passage of ships carrying HM but can lead these ships to use specific sea lanes when traveling through their territorial sea (Hakapaa and Molenaar, 1999). That right of the coastal States derives from Article 22 (1) of UNCLOS 1982.

5.2 International Convention for the Safety of Life at Sea (SOLAS), 1974

The SOLAS 1974 is regarded as landmark of all international conventions concerning the safety of ships because specifies minimum standards for the construction, equipment and operation of ships. One of the main objectives of SOLAS 1974 is to reduce the risk of pollution from HM carried by ships. Chapter VII refers to the requirements relating to the installation, marking and stowage of the HM on board vessels. The transportation of HM by ships is prohibited unless it complies with the provisions of Chapter VII that is International Maritime Dangerous Goods (IMDG) Code. Since January 2004 the code is mandatory and is included in the provisions of SOLAS 1974, Chapter VII, providing for the safe stowage and segregation of incompatible materials.

Furthermore the International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on Board Ships (INF Code) became mandatory on 01.01.2001 through amendments adopted under Chapter VII of SOLAS 1974. This Code specialized in safe carriage of packaged irradiated nuclear fuel, plutonium and high-level radioactive wastes on board ships. The creation of the Code is intended to provide rules that govern nuclear loads while there were no requirements for transporting such cargoes. The INF Code was adopted on a voluntary basis in 1993. It separates ships in three categories INF1 - INF2 - INF3 which can carry certain amount of nuclear cargo (Table 3). The 1998 amendments were introduced in the Code regarding the requirement for contingency plans and prior notification of coastal States in case of accident. The INF Code does not apply to warships.

Table 3

Class of ship	Class INF 1 ship	Class INF 2 ship	Class INF 3 ship
Criteria	Ships which are certified to carry materials with an aggregate radioactivity less than 4,000*TBq	Ships which are certified to carry irradiated nuclear fuel or high-level radioactive wastes with an aggregate radioactivity less than 2 X 106 TBq and ships which are certified to carry plutonium with an aggregate radioactivity less than 2 X 105 TBq	Ships which are certified to carry irradiated nuclear fuel or high-level radioactive wastes, and ships which are certified to carry plutonium with no restriction on the aggregate radioactivity of the materials

*TBq = Tera-becquerels is the S1 unit of disintegration of a radioactive nuclei per second e.g. 9 X 10^{12} Bq can be expressed as 9 TBq.

Source: (WNTI, 2010)

In addition, ships transport HM should comply with International Safety Management (ISM) Code. It became mandatory when adopted by SOLAS, Chapter IX (Management for the Safe Operation of Ships). ISM Code ensures safety at sea, prevention of human injury or loss of life and avoidance of damage to the marine environment and property (IMO, 2014).

5.3 International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)

MARPOL 73/78 is the abbreviation for The International Convention for the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978. This Convention covers prevention of pollution of the marine environment by ships from operational or accidental causes; except in cases of willful rejection. The convention consists of six annexes which contain standards relating to specific types of pollution. The Convention highlights a special regime with focus on preventing pollution. This is done with the standards set by the contract during the construction of ships, loading and discharging equipment and instruments.

Annex III (Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form) of MARPOL 73/78 is designed to prevent and minimize pollution from packaged dangerous goods carried by sea. For the time being, only Annexes I and II bind all contractual States of the Convention and ships are not required to comply with the annexes to the Convention which have not been accepted. The combination of the above may create different rules for each State (Churchill and Lowe, 1999).

5.4 Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (Basel, 1989)

The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal was adopted in 1989 and entered into force on 5 May 1992; after the disclosure in 1980 of trafficking in toxic waste from developed countries in Africa and elsewhere in the so-called Third World. It is regarded as the pioneer Convention on toxic and dangerous waste disposal; signed under the auspices of an international organization (United Nations Environmental Programme – UNEP), giving thus the stigma that the risk of these substances has become a threat to the entire planet.

The important point of Basel Convention, for the transportation of HM by ships through the territorial waters, is the right of coastal States for prior notification. Article 6 of the Convention requires that the flag State of the ship "notify, in writing, through the channel of the competent authority of the State of export, the competent authority of the States concerned of any proposed trans-boundary movement of hazardous wastes or other wastes". This obligation applies to the coastal States even if they have not ratified the Convention. According to article 2 (13), coastal States are considered "States concerned" and have to be informed in advance of the transfer of hazardous waste through the territorial sea.(Basel Convention, 2013).

The requirement of Basel Convention for prior notification is arising from the principle of the sovereignty of the coastal State. The sovereign State has the right to control its territory and regulate activities that take place in it. But the flag States argue that in this case no prior notification is needed because ships passage is innocent and not prejudicial to the peace, good order or security of the coastal State (Article 19 UNCLOS 1982). This view often creates controversy between flag and coastal States. It is noted that Basel Convention regards hazardous wastes as a shipment and enforces the control of mainly shore transboundary movements.

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

The HNS Convention, which is based on the Civil Liability and Fund Conventions which cover pollution damage caused by spills of persistent oil from tankers (e.g. CLC, 1992), ensures compensation for damage resulting from the maritime transport of hazardous and noxious substances. These substances (Appendix 2) are considered valuable for the development of society but also very dangerous for the environment. Also, the type of ships used by each category is specified.

In 2010 adopted a Protocol to the HNS Convention which was designed to solve problems that had prevented a lot of States from ratifying the HNS, the previous years. Once the HNS Protocol enters into force the HNS Convention will be renamed as "the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 2010". This Convention applies to damages caused by hazardous and noxious substances in the territorial sea, exclusive economic zone (EEZ) of a contractual party and also

outside the territorial sea of any State. The ship-owner will have strict liability for any damage from HNS pollution. No claim for compensation can be turned against the owner, beyond the provisions of the Convention. Liability is limited (IMO, 2014).

5.6 Paris Convention on Third Party Liability in the Field of Nuclear Energy (Paris Convention, 1960)

The Paris Convention of the OECD (Organization for Economic Co-operation and Development) on Third Party Liability in the Field of Nuclear Energy as amended establishes a special regime of civil liability for the issue at hand. "*This Convention does not apply to nuclear incidents occurring in the territory of non-Contracting States or to damage suffered in such territory, unless otherwise provided by the legislation of the Contracting Party in whose territory the nuclear installation of the operator liable is situated, and except in regard to rights referred to in Article 6(e)*" (Article 2 Paris Convention).

Through the 2004 Protocol to the Paris Convention, international contractual liability in case of a nuclear accident is enhanced and been in line with existing international nuclear liability conventions (e.g. Vienna Convention). In particular, the 1988 Joint Protocol Relating to the Vienna and the Paris Convention bridges the gap between these Conventions and extends the rights under the one Convention to victims in the territory of the other Convention. The Paris Convention was adopted under the auspices of the OECD (Organization for Economic Co-operation and Development) and covers most European countries. It can be ratified by any country member of OECD and non-member of the OECD with the consent of the States Parties of the organization.

5.7 International Atomic Energy Agency (IAEA) Regulations

International Atomic Energy Agency (IAEA) is dealing specifically with nuclear materials and transportation of such cargoes. Its regulations are resulting from the Treaty for the Non-Proliferation of Nuclear Weapons, 1968. Under article III of the Treaty non-nuclear-weapon States should accept IAEA safeguards to make clear that their nuclear activities established only for peaceful purposes.

Also, a regulatory system that addresses the safe transportation of nuclear materials is the International Atomic Energy Agency Code of Practice on the International Trans boundary Movement of Radioactive Waste, 1990. The Code ensures the sovereign right of States in their jurisdiction where they have the ability to prohibit the transportation of nuclear materials through this, while requiring prior notification for this purpose. These rules are not mandatory but are considered auxiliary to the rules of UNCLOS and customary international law (IAEA, 2013).

5.8 Vienna Convention on Civil Liability for Nuclear Damage 1963

The Vienna Convention 1963 as amended by the 1997 Protocol provides that "liability of the operator for nuclear damage shall be absolute" (article IV)and "the operator shall be required to maintain insurance covering his liability for nuclear

damage" (article VII 1). Furthermore, the State shall ensure payment of claims for compensation for nuclear damage by providing the necessary funds to satisfy such claim.

Among others, the 1997 Protocol includes a new definition of nuclear damage; extends the geographical scope of the Vienna Convention, extends the time within an action for damages for loss of life and physical damage could be filed and significantly increases the minimum compensation. Moreover, it contains new provisions on jurisdiction producing consequences of a nuclear accident during transportation of nuclear material to or from a facility located in the territory of a contracting State to the Vienna Convention.

Nevertheless, 1997 Protocol provides for the exclusive jurisdiction of the courts of the Contracting State for coastal nuclear accidents within the exclusive economic zone. The jurisdiction is recognized provided that the depositary of the Convention received notification for the establishment of such a zone before the nuclear accident. Note that there is no EU legislation governing civil liability in the field of nuclear energy (Vienna Convention, 1963).

5.9 Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material (NUCLEAR, 1971)

The NUCLEAR Convention was adopted in 1971 by a Conference which convened of IMO, IAEA and the European Nuclear Energy Agency of the OECD. This Convention is about the liability in case of damage arising from the sea transportation of nuclear substances. The conflicts of certain maritime Conventions on ship owner's liability were aimed to resolve by the application of NUCLEAR Convention. Under the provisions of NUCLEAR Convention an individual "*otherwise liable for damaged caused in a nuclear incident shall be exonerated for liability if the operator of the nuclear installation is also liable for such damage by virtue of the Paris Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy; or the Vienna Convention of 21 May 1963 on Civil Liability for Nuclear Damage; or national law which is similar in the scope of protection given to the persons who suffer damage*" (IMO, 2014). The Convention was signed by a few States because basic provisions were considered to be covered by MARPOL.

6. Regional Conventions

6.1 Bamako Convention

The Bamako Convention on the ban of the Import into Africa and the Control of Trans-boundary Movement of Hazardous Wastes within Africa (1991) is relied on Basel Convention. Cause of the creation of the Bamako Convention was the demand of African countries for a global ban on the export of hazardous wastes which led to their refusal to sign the Basel Convention. The Bamako Convention addresses the hazardous waste according to their place of origin and requires the consent of the coastal State in transit through the territorial sea of hazardous waste. The lack of an effective control mechanism coupled with inadequate funding makes it difficult to implement the purpose of the Bamako Convention, (Ogunlade, 2010).

6.2 Barcelona Convention

In 1975, sixteen Mediterranean countries and the European Community adopted the Mediterranean Action Plan (MAP), the first-ever Regional Seas Programme under UNEP's vigilance. In 1976, these Parties adopted the Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention, 1975) which includes the Hazardous Wastes Protocol within Seven other Protocols. Even if Mediterranean countries were clearly informed of the existence of the Basel Convention they agreed to adopt a Mediterranean new protocol to the Barcelona Convention on trans-boundary movement of dangerous waste (Izmir, 1996). This protocol includes provisions *inter alia* on the prior notification of the coastal State when a ship carrying nuclear cargo enters in its territorial sea, (Barcelona Convention, 1975).

7. Proposals and Recommendations

The debate between flag and coastal States is centralized on the fundamental issues of the right of prior notification and the relevant authorization by the coastal State. The flag States seem reluctant to accept these fundamental issues as obstacles to the right of freedom of navigation. They argue that the disclosure of travel tends to make it dangerous due to potential terrorist or pirate attacks. It is said that these arguments are unilateral and prior consultation with the coastal State regarding the passage plan, makes the journey safe. But the flag States are still against this argument (Churchill and Lowe, 1999). This controversy between the States shows that communication needed so as to settle the matter and find possible solutions as the ones which are described below.

A. Regional Agreements

The marine environment of the coastal States is subject to risk due to the transport of HM through their territorial sea. One workaround is regional agreements that set standards on regional level for the transport of HM by ships. It is said that proposal will create further conflicts in the shipping industry at the expense of shipping and free international maritime trade because ships will have to comply with IMO regulations and regional agreements.

B. Sea Lanes

Sea lanes determination could help to resolve the conflict arising from the different meaning of right of innocent passage between the States and the obligation to protect the marine environment. Prescribing one sea route for ships carrying HM could possibly bridge the gap between flag and coastal States. In that way such ships would enter as little as possible within the territorial sea and use of corridors approved by the coastal State. The Green Corridors concept would be used by States in this case (Europa, 2009). A State is not required to implement a zone of jurisdiction in all the bordering seas but may establish zones in certain sea areas only. The way of establishing a zone of jurisdiction depends solely on the domestic law of the coastal State. The sea area for transporting dangerous materials may be in line with the

procedure adopted by France and Italy to establish "ecological protection zone" in the Mediterranean. This proposal, however, is not very reliable because it is not the final solution to the conflict under international law. Rather, applying, the States will continue to maintain their positions without having clarified the basic legal framework (Srati, 2012).

States feel reluctant to agree to further adjustment on the right of navigation, since there is fear that the freedom of navigation will be limited and much more that will address topics on Particular Sensitive Sea Areas (PSSA). With the introduction of this term the international legislature intended to protect sensitive sea areas of maritime activity. The inclusion of an area in this class is based on ecological and socioeconomic criteria. Today, the creation of PSSA may solve the conflict of flag and coastal States if further States establish an international agreement that defines several such prohibited sea areas to HM transportation (Tanaka, 2012).

C. Self – Regulation and Self – Restraint

The consultations between States may be accelerated when the value of the marine environment becomes more widely known and people understand the risks posed by environmental pollution sources (Hardin, 1968). The agenda of the consultations between the flag and coastal States should also include the services offered by the environment and losses (negative externalities) suffered from the effects of the financial - business society, namely the transfer of HM by sea. Flag and coastal States must choose whether or not they consider the environment irreplaceable and on this basis to settle the issue of the controversy.

For example, if we consider that the debate over the issue of HM transportation by sea, is a case of market failure (Stiglitz and Walsh, 2010), then to deal with the situation can be proposed, in addition to the above, policies regulating the problem as follow:

(i) The Pigovian Taxes theory is the most direct application of the “polluter pays” principle. Pigovian Taxes, by the name of economist Arthur Pigou, are taxes, in this case, to shipping activity which generating costs for States and taxpayers (negative externalities) that is taxation on ships carrying HM from the coastal State when such loads passing through the territorial waters. Surely here should have lifted the secrecy of passage plan maintained by the flag States. The Pigovian Taxes would correct this controversy through States and the potential social and environmental cost due to a hazmat ship accident would be covered directly by shipping companies (Baumol, 1972).

(ii) Coasian bargains, by the name of the great Nobel laureate economist Ronald Coase, is another theory according to which the benefits to carriers of hazardous materials by sea (flag States) potentially have external effects that exceed the costs incurred by the coastal States, then the first may indemnify the second and improve the position of the two. The sovereign right of the State in its territorial sea is not affected (Medema, 1997).

8. Conclusion

Certainly, legislative initiatives to resolve the debate between flag and coastal States as identified above will produce tangible results. But while economic development of States has been recognized as the main driving force of regulating initiatives; today the main challenge is to promote growth combined with environmental protection in order to create sustainable development of the planet. The way to cancel the States controversy rests on the application of the appropriate economic, social and environmental policies based on shipping business practices and provisions of UNCLOS 1982.

So while the debate on the issue between flag and coastal States persists, the transport of HM by sea will be conducted more frequently because of the small cost compared to other modes. The policy to be determined on the environment is a matter of society. Keen on this principle should be mild interventions in order not to have further impact on the environment but instead to improve and upgrade the quality of coastal areas thereby ensure the environmental public goods.

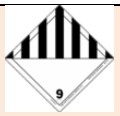
However, the right of innocent passage needs further interpretation, elaboration and evolution in order to satisfy all parties involved. Through Article 19 of the UNCLOS 1982 an attempt was made to determine the non-innocent passage but to take a position with respect to the subjective and objective perspective of the issue, creating additional controversies. The requirements of the coastal States on the subject of prior information does not contradict the UNCLOS 1982 as the Convention allows the protection of the marine environment and thus allow coastal States to require from ships entering their waters relevant data. This confrontation on the issue of transportation of HM cannot be solved with one simple decision. Also the rules for the transportation of these materials are not enough for the coastal States and international community to be reassured. The proposals on the issue would be discussed initially at regional and international level out of UNCLOS 1982 and then at a new UNCLOS Conference under the auspices of United Nations.

Consequently there exists an international regime that regulates the general conditions of HM transportation by sea. However it should be noted that, in most cases, the international legal framework does not empower coastal States to make claims and may block the innocent passage of ships transporting HM when they think that eventually the passage is not innocent. Nonetheless, regional conventions on cooperation for the protection of the marine environment from pollution entitle coastal States to require prior notification and to grant consent before passing HM through their territorial sea.

The creation of limited marine areas - corridors where transportation of HM will be allowed solves the problem after the regulation does not cause any changes in the international regime governing freedom of navigation and will clearly satisfy the coastal States, which are responsible for defining the specific areas. It should be borne in mind that when there is a risk of irreversible damage to the environment of socioeconomic policy options exercised then the shipping stakeholders, in this case, should play an important role in decision-making and measures that aim to prevent environmental degradation and the legal resolution of this controversy. Eventually, perhaps, the creation of a financial instrument valuation of the benefits of the marine

environment, tailored to the requirements of UNCLOS 1982, will mark the new era of sustainable development in the transport of HM by sea, which can also be directed to the objectives of the EU Environmental Policy.

Appendix 1

CLASS	DANGEROUS GOODS	SYMBOL
Class 1	**Explosives**	
Class2	**Gases**	
Class3	**Flammableliquids**	
Class4	**Flammablesolids**	
Class5	**Oxidizing substances and organic peroxides**	
Class6	**Toxic&infectioussubstances**	
Class7	**Radioactivematerial**	
Class8	**Corrosivesubstances**	
Class9	**Miscellaneous Dangerous substances**	

Source: (Authors)

Appendix 2

Bulk

	Can be found in
I **Oils**	Regulation I Appendix I MARPOL 73/78
II **Liquids**	Regulation 1.10 Annex II MARPOL 73/78
III **Liquids**	Chapter 17 of IBC Code
V **Gases**	Liquefied Gases - Chapter 19 of IGC Code
VI **Liquids**	Flashpoint not exceeding 60°C
VII **Solids**	Both in IMSBC Code and IMDG Code (1996) in packaged form

Packaged goods

	Can be found in
IV	IMDG Code

Source: (HNS Convention, 2010)

References

Barcelona Convention, 1975.
Available at: http://www.unepmap.org/index.php?Module=content2 &catid=001001004 [Accessed on 08.01.2015].
Basel Convention, 1989.*Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*. Available at: http://www.basel.int [Accessed on 07.01.2015].
Bamako Convention, 2013.Available at: http://www.imo.org [Accessed on 08.01.2015].
Baumol,W.J., 1972.*On Taxation and the Control of Externalities*. American Economic Review, 62(3), 307-322.
Birnie, P., Boyle, A., Redgweel, C., 2009. *International Law &The Environment*, 3rd ed. Oxford University Press.
Cape Ray's mission, 2014. *Ship that destroyed Syrian chemical weapons returns home*. Available at: http://archive.navytimes.com/article/20140917/NEWS/309170063/Ship-destroyed-Syrian-chemical-weapons-returns-home, [Accessed on 15.01.2015].
Churchill, R.R., and Lowe, A.V., 1999. *The Law of the Sea*, 3rded.ManchesterUniversity Press, Manchester.
Dixon, M., 2013. *Textbook on International Law*. 7th Ed. OUP Oxford.
Environmental Policy Review, 2009. Available at: http://ec.europe.eu/environment/policyreview.htm [Accessed on 10.01.2015].
Europa, 2009.Available at: http://ec.europa.eu/transport/themes/sustainable/events/2009_12_09_green_corridors _conference _en.htm [Accessed on 12.01.2015].

Evans, M., 2014. *International Law*. 4th Edition, OUP Oxford.
Hakapää, K., and Molenaar, E. J. 1999.Innocent Passage-past and present. *Marine Policy*, 23 (2), 131-145.
Halifax Explosion, 1917.*The case of SS Mont Blanc*. Available at: http://www.cbc.ca/halifaxexplosion/, [Accessed on 08.01.2015].
Hardin, G., 1968.The Tragedy of the Commons. *Science*, 162, No. 3859, 1243-1248.
Harrison, J., 2013. Making the Law of the Sea: A Study in the Development of International Law. Cambridge University Press.
HNS (Hazardous and Noxious Substances) Convention, 2010.Available at: www.hnsconvention.org/Pages/Reporting.aspx [Accessed on 12.01.2015].
IAEA (International Atomic Energy Agency), 2013. Available at: http://www.iaea.org,[Accessed on 02.09.2014].
IAEA (International Atomic Energy Agency), 2007.*The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation For Nuclear Damage: explanatory texts*.International Atomic Energy Agency, Vienna.
Ievoli Sun, 2000. The Ievoli Sun Chemical Tanker Incident. Available at: http://www.marineinsight.com/misc/marine-safety/the-ievoli-sun-chemical-tanker-incident/, [Accessed on 02.12.2014].
IHMM, (Institute of Hazardous Materials Management), 2014. Available at: http://www.ihmm.org, [Accessed on 04.12.2014].
IMO, (International Maritime Organisation), 2014. Available at: http://www.imo.org, [Accessed on 10.12.2014].
Kraska, J., 2011. *Maritime Power and the Law of the Sea*. Oxford University Press Inc, New York.
Mandaraka-Sheppard, A., 2013.*Modern Maritime Law (Vol.2): Managing Risks and Liabilities*. Routledge, London.
Medema, G.S., 1997. *Coasean Economics: Law and Economics and the New Institutional Economics*. Kluwer Academic Publishers, Boston.
Nasa Safety Center, 2013. The Collision of the SS Mont-Blanc and the Halifax Explosion.. *System Failure Study*. January, Vol.7 Issue 1.
Nuclear, (Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material), 1971. Available at: http://www.imo.org/About/Conventions/ListOfConventions/Pages/ Convention-relating-to-CivilLiability-in-the-Field-of-Maritime-Carriage-of Nuclear-Material(NUCLEAR).aspx [Accessed on 01.10.2014].
Ogunlade, A., 2010. *Can the Bamako Convention Adequately Safeguard Africa's Environment in the Context of Transboundary Movement of Hazardous Wastes*. Available at: http://www.dundee.ac.uk/cepmlp/gateway/?news=31280 [Accessed on 29.09.2014].
Paris Convention, (Paris Convention on Third Party Liability in the Field of Nuclear Energy), 1960. Available at: http://www.oecd-nea.org/law/nlparis_conv.html [Accessed on 03.09.2014].
Rothwell, D., 2010.*The International Law of the Sea*. Hart Publishing, Oxford.
Prestige, 2002. *The Prestige Tanker Case*. Available at: http://www.cedre.fr/en/spill/prestige/prestige.php [Accessed on 03.09.2014].
Shaw, M. N., 2014. *International Law*. Cambridge University Press, Cambridge.
Stiglitz, J., E., and Walsh C., E., 2006. *Principles of Microeconomics,* 4th ed. WW Norton & Company Inc, New York.
Strati, A., 2012. *Greek Sea Lanes & Limitation with Neighbouring States*, Nomiki Vivliothiki, Athens (in Greek).
Tanaka, Y., 2012.*International Law of the Sea*. Cambridge University Press, Cambridge.
The Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997. Available at http://www.legislation.gov.uk/uksi/1997/2367/made/data.pdf [Accessed on 16.09.2014].
UN, 2013. Oceans & Law of the Sea. Declarations and Statements. Available at: http://www.un.org/Depts/los/convention_agreements/convention_declarations.htm[Accessed on 09.01.2015].

UNCLOS, 1982.*United Nations Convention on the Law of the Sea of 10 December 1982*. Available at: http://www.un.org/Depts/los/convention_agreements/convention_overview_convention.htm [Accessed on 05.10.2014].

Vienna Convention, 1963. *Vienna Convention on Civil Liability for Nuclear Damage*. Available at: http://www.iaeaorg/Publications/Documents/Conventions/liability.html [Accessed on 15.09.2014].

WNTI (World Nuclear Transport Institute), 2010. Available at: http://www.wnti.co.uk/media/3762/5.pdf [Accessed on 18.09.2014].