The authority of *en route* coastal states to alter the itinerary of transboundary shipments of spent nuclear fuel

Examining coastal states' right to information and control over vessels sailing their waters

Master Thesis for the Master of Law Programme
(Tillämpade Studier, 30 hp)

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Autumn 2007

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ABSTRACT

This thesis starts with noting that the rapid globalisation of the late twentieth and the twenty-first century has resulted in a shift from a national to an international level concerning certain issues. Local governments find themselves unable to control the risk of radioactive pollution that vessels traversing their coastline pose. The purpose of this thesis is to examine to which extent a coastal state can influence an *en route* transport of spent nuclear fuel. It examines four possible degrees of control; an unconditional ban, prior informed consent, prior information and no information. Secondly, it also examines how the *en route* state influence varies in the territorial waters, the EEZ and adjacent high seas.

After assessing nuclear law, maritime law and environmental law first on a principal level, secondly by looking into the actual legislation and case law; this thesis finds that the question currently is uncertain. It is however clear that the coastal states does not have any influence in adjacent high seas. The territorial waters are under coastal states sovereign jurisdiction and thus, rights to influence are largest in these areas. The EEZ is a zone *sui generis*, a mixture between the regulation on the high seas and in the territorial waters, but leaves some room for coastal state jurisdiction on environmental issues.

The principles of cooperation, sovereignty, prevention and precaution all provide good arguments for that coastal states shall be entitled to receive prior notice or give a prior informed consent to a scheduled shipment. Recent EC law and the law of Chile and a few other countries also prescribe a procedure of prior information and consent. However, the main conflict is that with the principles of free navigation and innocent passage that limits the coastal states sovereignty in its territorial waters and the EEZ.

The main conclusion of this thesis is that although the rights of coastal states to control *en route* shipments of spent nuclear fuel does not gain full support by the current patchwork of controlling legislation, there are several indications that this is about to change. The 2006 changes of EC legislation is one important move towards a duty of prior informed consent. Another is the *non sequitur* evident in that prior informed consent to *en route* states is mandatory when it comes to the transportation of other hazardous wastes, regulated in the Basel Convention.

CONTENTS

ABBREVIATIONS

EC	European Community
ECJ	European Court of Justice
EEZ	Exclusive Economic Zone
EU	The European Union
EURATOM	The European Atomic Energy Authority
GNEP	(US Deportment of Energy's) Global Nuclear Energy Partnership
GATT	General Agreement on Tariffs and Trade
IAEA	International Atomic Energy Agency
IMO	International Maritime Organization
ITLOS	International Tribunal for the Law of the Sea
NGO	Non-Governmental Organization
MOX fuel	Mixed oxide fuel
OECD's NEA	Nuclear Energy Agency of the Organization for Economic Co-operation and Development
UNCLOS	United Nations Convention on the Law of the Sea
WTO	World Trade Organization

1: INTRODUCTION

The rapid globalisation of late has altered the concept of risk. The twenty-first century civilisation is explained as being a world risk society.[1] This description is a reflection on how problems that until recently was perceived as local, increasingly is found to have global impact. In the environmental area, this is reflected in a fear that manufactured products pose a potentially irreversible threat to the habitat of man. Characteristic of these risks are that they are surrounded by a scientific uncertainty as to the effects or the probability of an incident; consider the examples of genetically modified foodstuffs, greenhouse gas emissions and nuclear power plants. At the same time, consummation of the risk implies damages that are potentially irreversible beyond a surveyable time.

The globalisation has contributed to a shift in focus from a local to a global level, enabling the world society to realise that also small emissions, causing an indeterminate damage locally, may for example contribute to the global warming or the stratification of the Baltic Sea. However, the globalisation has also resulted in a greater mobility of products; thus resulting in an increased risk globally, that is not always reflected on a national level.

Most national governments, at least those of a democratic character, have national systems promoting legal security, transparency and control mechanisms as to mitigate environmental damages.[2] This is conceived as one of the cornerstones of a functioning democratic society. However, as risks are increasingly becoming a global problem, there is a democratic deficit in the system. Local governments experience a lack of control over risks posed by transboundary pollution; as the system enforcing rights of foreign citizens, or their governments, is not as developed as national control systems are.

The problem becomes especially prominent when the risk does not emanate from a point source, such as a nuclear plant on the other side of the border; but instead is a mobile source of risk, such as a ship loaded with highly radioactive cargo. This will be the topic of this thesis.

1.1. Background

The issue of transport of spent nuclear fuel is controversial; involving several dichotomies on both legislative and political level. Primarily, the hazardous nature of the cargo gives rise to concerns regarding security. Business organizations often emphasize that the transport of nuclear materials is exceptionally safe and that no major accident has occurred during almost half a century of transports.[3] Environmental Non-Governmental Organizations (NGOs) admits to this fact but focus on that the risk is still too high considering that the effects of a major accident would be grave and irreversible.[4]

Secondly, nuclear fuel has dual fields of use. In addition to a peaceful application in producing energy, it can also be converted into a weapon.[5] Due to the last decades perceived

1 Mason, M., New Accountability: Environmental Responsibility Across Borders, Earthscan Canada, 2005, p 1.
2 Mason, M., p 1-2.
3 See for example World Nuclear Transport Institute, (On their front page, 6 August 2007: ”45 years, Transport of Nuclear Materials, carried out safely and reliably”), http://www.wnti.co.uk/
4 See for example Greenpeace, http://www.greenpeace.org/international/news/nuclear-transports-endanger-pa
5 Primarily it is possible to construct a radiological dispersal device; combining the nuclear material with

threat of terrorists; concerns about cargo ending up in the wrong hands are increasing. This fear leads shipping countries to the conclusion that an increased secrecy about the shipments is necessary. Due to that transports are perceived to be under a greater threat than previously they also pose a greater risk for the coastal countries. Therefore, coastal states are anxious to know what transports that take place in their regions.

Furthermore, to use or not to use nuclear power is a political decision. Where some countries, such as Finland, are expanding; others are planning to phase out their nuclear programs. A third category is principally against the use of nuclear energy and declares their states to be nuclear free zones. Especially for this last category, it is provoking to be exposed to the risk entailed in ships navigating off their coasts, loaded with spent nuclear fuel; after all, they have nationally decided to opt out from this hazard.

Finally, in terms of maritime law shipments of spent nuclear fuel actualize the conflict between a coastal states right to protect its shoreline versus the vessels right to free navigation and innocent passage. This is essentially a conflict between old navigational principles restated in the law of the sea and recently emerging principles of environmental law, which questions the current balance between flag states and the coastal states in the area of vessel control.

1.2. Current trends

Lately the international environmental debate has taken a turn in favour of nuclear power. In the light of a threatening global warming, some argue that nuclear power may be necessary as an alternative to other sources of energy that release more carbon into the atmosphere.[6] At the same time, there is still no universal solution for what to do with the spent nuclear fuel, piling up as a consequence of the worlds increasing nuclear capacity. The solutions range from reprocessing to terminal storage via new trends such as transmutation; the latter a method to reduce the amount of ultrahazardous waste that normally is a by-product of the reprocessing procedure.

Common for all solutions are that they may involve transboundary transports. The most frequent reason for transboundary transportation is currently reprocessing, as not all countries have their own reprocessing plant. Transmutation is still a technique on the drafting board. However, the size, complexity and costs of constructing such a plant would not make it viable for every country to build its own, should the technique become a real alternative. Moreover, although many countries have plans on building their own deep storage facilities, the siting have met strong opposition by local stakeholders. As a consequence of this, and motivated by the prospective to increase security by having only one or a few places for terminal storage, the IAEA regularly recommends that a common depository should be created. Finally, it shall be noted that the US Department of Energy's GNEP proposal suggest a form of nuclear leasing; that some countries should hire nuclear fuel, returning it to its country of origin after use, rather than building own facilities for final storage or reprocessing.[7]

As a conclusion, the recent developments and current proposals for the future of nuclear

regular explosives, to spread radiation over a larger area. Secondly it is possible to produce nuclear weapons, which however would demand advanced equipment for reprocessing.

6 See as an example of this the recent report on the climate change; nuclear power plants are mentioned as a key mitigation technology. IPCC, 2007. Climate change 2007: Mitigation, p 14.

7 See http://www.gnep.energy.gov/ for more information on the GNEP program.

energy indicates that it is likely to increase or at least remain on its current levels. As demonstrated in the above examples, the amount of transboundary transports is hence also likely to increase. Therefore it is important to analyze the adequacy of the current legislation in advance. One particularly important question concerning transports of spent nuclear fuel is to what extent stakeholders along the planned route has opportunity to influence the choice of route, the standards of safety and perhaps even to implement their own safeguard routines, to alleviate the effects of a possible accident.

1.3. Purpose

In June 2007 AB SVAFO announces that they intend to transport spent nuclear fuel from Sweden to Sellafield, Great Britain, for reprocessing. Disregarding the anomaly that such a transport is in Sweden, due to the national principle of self-sufficiency in the field of nuclear energy; the final words of the press release evokes a few questions.[8] Freely translated, the sentence reads as follows; *"Concerned authorities along the route will be kept informed".*[9] *A priori*, this sounds both logical and uncontroversial; but as will be shown throughout this thesis, there is no binding obligation for a party shipping spent nuclear fuel to inform all countries *en route* to the country of destination.[10]

First of all, it shall be noted that in this thesis using the term *en route* state is a conscious choice. This serves the purpose of distinguishing the group of countries referred to in this thesis from two similar categories; the transit state and the coastal state. The *en route* state is naturally also a coastal state, but with the qualification that it is neither the country of origin nor destination; its ports are never intended to be called. The transit state is characterized by that it is passed through, although not being the final destination. Transit states are defined differently in different treaties; sometimes it is taken to mean only internal waters or on the actual *terra firma*; others are vaguer thus possibly including also the territorial waters or even the EEZs.

The purpose of this thesis is to examine to which extent an *en route* country can influence a transport of spent nuclear fuel. Working from the assumption that access to information is the key to influence, I have chosen to examine four possible degrees of control; an unconditional ban, prior informed consent, prior information and no information. Secondly, how far from the coast line does the *en route* state control reach; the territorial waters, the EEZ or even beyond, to adjacent high seas?

Focus will be on what room for manoeuvre that *en route* states have to exercise control over their waters within the UNCLOS and if it is possible to expand the *a priori* reading by introducing environmental principles, such as the precautionary principle.

1.4. Delimitations

Out of the around 20 million transports of nuclear materials that takes place each year, 95 %

8 Concerning the self-sufficiency principle in Sweden, see R-07-11: Cramér, P., Stendahl, S., Erhag, T., "Nationellt ansvar för använt kärnbränsle i en utvidgad Europeisk Union", SKB 2007.

9 Translation from Swedish. Press release from AB SVAFO, 2007-06-05, www.svafo.se

10 It shall be noted that it is neither clear what criteria AB SVAFO use to determine if a country is "concerned" nor what kind of information these countries are entitled to, in that case.

are unrelated to the nuclear fuel cycle.[11] These transports concern low radiation materials used for example hospitals or industries. These transports will not be discussed in this thesis, as the risks involved transporting such materials are different from the risk posed by transports of spent nuclear fuel.

The term spent nuclear fuel is used as to include both fuel destined for reprocessing and fuel destined for terminal storage. In practice, there is no difference between the two, other than that one is defined as a product and the other as a waste. According to current legislation, they are; although sometimes separate in definition, in practice regulated similarly.

When discussing the transport of spent nuclear fuel, there are a number of interesting issues that I have chosen not to include in this analysis, due to its limited format. The question of liabilities in transporting nuclear fuel, should an accident happen, is not obvious. Questions on what should happen, who should pay and how much are among those I have left outside this thesis.

As the topic is transboundary transports, aspects of national law will only be provided, should they contribute to the understanding of how the international system shall be interpreted. On a national level, there are hence many difficult and interesting questions that have been left out. Of particular interest, although unfortunately left out, is the question of the imbalance between import and export restrictions on spent nuclear fuel, both on national and EU level.

Furthermore, only transports in coastal states territorial water, its EEZ or on the adjoining high seas will be examined in this thesis. I find these three groups to be representative, although a thorough examination also rightly should include straits and archipelagic states. Furthermore, as noted above, it is presumed that the *en route* coastal state is neither state of origin nor state of destination.

Finally, this thesis focuses on the *en route* states rights to receive advance information, consultation or ban an *en route* passage. There are a number of adjoining questions that can and should be posed; such as if it is possible to demand stricter environmental standards than is imposed by the vessels' flag state and how they could be designed and in what ways they then should be enforced. However the actuality of such questions is dependent on the primary assumption that the coastal state has access to information and therefore, this thesis will focus on that initial premise. As previously noted, access to information is the first step towards influence.

1.5. Structure and Methods

The topic of this thesis, to analyze what possibilities an *en route* coastal state has to be informed about, and influence on, a certain shipment of spent nuclear fuel, draws on a few different legal areas.[12] The cargo studied is spent nuclear fuel; this naturally indicates that the area of nuclear law needs to be consulted. The nuclear field is special; the specific hazards of nuclear material, combined with a shift from the secrecy of a military product into the transparency of the public sphere has had profound influence on its governing principles.

11 Statistics from the World Nuclear Transport Institute, http://www.wnti.co.uk/index.php?pageID=72

12 As mentioned in the delimitations, the transnational character of the transports indicates that it is only the international legislations that are considered.

Secondly, there is the transport angle; as this thesis is limited to naval transports, this implies maritime law. Maritime law is an old field of law, with well established principles many which has long been a part of international customary law; however, that have also been questioned by coastal states, in the context of environmental protection.

This, as well as the hazards of transporting radioactive material and the hazards of naval transport as such, indicate that also environmental law must be taken into consideration. This comparatively new field of law has evolved quickly during recent decades; its principles are not yet settled, in the same way as principles in for example maritime law. At the same time, there are also customary principles of international law, such as the principle of cooperation, that may be relevant to environmental protection.

Due to the disparate set of legal areas that are examined; this thesis begins with a chapter[13] analyzing what principles that each area provides that are of interest to the shipment of nuclear materials. The purpose of this is to provide the reader with an insight in what overlaps and what differences that exist between and within the areas, on a principal level.

Discussing these principles also provides an opportunity to illustrate why coastal states want prior information or control. However, the underlying reasons are not limited to legal arguments; therefore the explanations sometimes use arguments from other social sciences. This thesis is not meant to provide a complete catalog of interdisciplinary reasons, instead, when given they shall be considered as examples of circumstances that are relevant in assessing the adequacy of the law in force.

Next, Chapter 3 sets out to find the applicable legal rules. After a preliminary conclusion, based on existing legal conventions and articles, case law and other practical examples are examined. This is done through examining the validity, according to international law, of previously cited arguments that coastal states have used to alter the route of a vessel with nuclear cargo. The sources in this chapter are mainly legal texts, precedents, legislative history and doctrine.

After assessing different approaches in Chapter 3, the final chapter will sum up the conclusions of this thesis as well as provide some general comments as to the current situation and the interesting effects that are the result of the discrepancy between law and diplomatics in international law.

Finally, it shall be noted that due to the specific nature of the subject, this thesis is based on material drawing from several disparate sources. This wide scope was unavoidable due to the fact that the area currently is in transition. It is now a patchwork of separate controlling mechanisms constituting a rudimentary legal base, but as this thesis will show, there are indications on many different levels that it is about to transform. Hence, in this thesis I have used both soft law declarations, international customary principles, international and regional treaties as well as national legislation. Similarly, I have reviewed both case law from international tribunals as well as examples from international practice, yet to be tried by arbitrators or judges. To a large extent I have tried to combine the separate conclusions drawn in the area of maritime law, international law, environmental law and nuclear law by scholars within their respective field to reach conclusions on how these separate areas combine.

13 Chapter 2.

2. PRINCIPLES ON NAVAL TRANSPORT OF NUCLEAR MATERIALS

2.1. Introduction

The purpose of this chapter is to provide a theoretical background to the legal investigation in Chapter 3. The question posed in the introduction; to analyse what possibilities an *en route* coastal state has to be informed about, and given influence on, a certain shipment of spent nuclear fuel, clearly evokes the need to investigate several legal areas. It is not a question that can be solved by only taking into consideration for example, maritime law.

The regulation of naval transports of spent nuclear fuel draws primarily from three areas of law; nuclear law, maritime law and environmental law. In addition to this, the transboundary nature of the transports in question also actualises issues of public international law. Naturally, these areas are not isolated units, but must all be considered in order to find what right coastal states have to influence a particular shipment. In the following sections, a background will be provided to how the different legal disciplines have addressed the risks of transporting nuclear materials. As this thesis is limited to international transports, national legislation will not be discussed unless it is relevant to the transnational level.

This initial chapter will introduce the basic principles that characterises the areas of nuclear law and environmental law; the section on maritime law will introduce freedom of navigation and innocent passage. There are different kinds of principles; those that are narrow and technical; those that are recognized in hard law, soft law, regional or national law. There are furthermore principles existing in several areas of law, such as the duty not to harm other countries environments, but also principles specific to one particular section of an area of law; such as the ALARA-principle used in nuclear law defining that risk of radiation should always be kept "as low as reasonably achievable".[14] However, in this initial chapter, I shall not discriminate between different types of principles; the purpose is not to identify the positive legislation, but to indicate the issues that needs to be taken into account when considering a coastal states right to interfere with another states transportation scheme.

This chapter will therefore stay on a general level; a detailed review of specific regulations as well as a discussion on previous case law will be done in the next chapter. Instead, this chapter will focus on highlighting the basic concepts that overlap or are in contradiction with each other. This will hopefully serve to provide the reader with insight in what interests that lie behind the specific articles and legislations which will be discussed in Chapter 3.

2.2. Background to Nuclear Law

The Dual Focus of Nuclear law

The area of nuclear law is characterized by the fact that the object of legislation is a substance inherently dangerous to the safety of people, animals and the environment in general. A radiological accident could lead to serious damage, contaminating areas for an indefinite time. On the other hand, the usage of nuclear materials provides possible societal gains; ranging from many medical and industrial usages to nuclear energy. Hence, on a national level,

14 On the character of different principles and the importance in separating them, see de Sadeleer, N., *Environmental Principles – from political slogans to legal rules*, Oxford University Press Inc, New York, 2005, p 2.

nuclear law is dual, concerned with controlling risks, but promoting the beneficial areas of nuclear practice.[15] On the international arena however, the issue can not be said to be this simple. As mentioned before, not all countries believe that the risks of nuclear energy are balanced by its gains. Hence, in some countries[16], assessments of the dual concerns of nuclear law (risks and benefits) have resulted in a prohibition, rather than a regulation. This means that any nuclear activity that takes place on a transnational level, or that may have transnational effects, must deal with the difficult question that some countries have opted out of nuclear energy altogether. To these countries, it is not a question of balancing risks with benefits; as they have opted out of having a nuclear power programme, they have nothing to gain from transboundary transports of spent nuclear fuel. An *en route* shipment of nuclear fuel along their coastlines can, from this perspective, only be seen as an extra risk.

However, there is not only a dichotomy between nuclear and non-nuclear countries. All countries having their own nuclear programmes also make an individual assessment of how risks and benefits shall be balanced. Although as will be seen below, there are a number of international regulations concerning the safety of transport; but whether or not these are followed can be known only by the country performing the transport. Therefore, also countries with own nuclear programmes that are situated *en route* of shipments of spent nuclear fuel may rightfully have an interest in knowing when, and with what degree of safety, a transport is scheduled.

Principles of Nuclear law

Nuclear materials originally stem from military research programmes.[17] Combining the historical secrecy surrounding nuclear research and practice with the inherently hazardous nature of the materials it is not difficult to understand why this area traditionally is excepted from more general legislation. Although the physical properties of nuclear materials do not *a priori* preclude them from being included under other legislation concerning hazardous wastes, such as the Basel convention[18] or the HNS convention[19], this is not the practice. Instead, there is a continuous practice of special legislation in the field of nuclear activities which has resulted in that nuclear law can rightly be viewed as a separate area of legislation. At the same time, it is important to note that the division of legal areas into separate fields is artificial; to a greater or lesser extent, they are all influencing each other. For example, when considering the area of energy law, it is becoming increasingly difficult not to also integrate environmental concerns and EC law. At the same time, bearing this in mind, I find that distinguishing an area of law as *nuclear law* fills the purpose of clarifying what specific blend of interests that needs to be balanced, notwithstanding that they draw from a multitude of different sources.

Hence, there is a set of fundamental principles that outline the area of nuclear law.[20] Not all of

15 Stoiber, C., Baer, A., Pelzer, N., Tonhauser W., Handbook on nuclear law, International Atomic Energy Agency, Vienna, 2003, page 3.

16 To mention a few: New Zealand, Norway, Portugal, Chile, many African and South-east Asian countries does not have any nuclear power plants for commercial use. However, the reason why naturally varies across the world. Not all countries without nuclear power plants are principally against nuclear power.

17 Stoiber *et al*, p 6.

18 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, see Article 1 (3). The applicability of the Basel Convention will be further discussed in Chapter 3.

19 International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996, see Article 4.

20 According to Stoiber *et al*, these are: The safety principle, the security principle, the responsibility principle, the permission principle, the continuous control principle, the compensation principle, the sustainable development principle, the compliance principle, the independence principle, the transparency principle and

these are relevant in the case of transboundary transports of spent nuclear fuel. However, a few of them deserves to be commented upon here. As noted above, several principles of nuclear law are in fact also general principles of environmental law. This deserves to be highlighted already at this point, as this is of importance later when assessing to what degree environmental principles can influence the classic legal field of maritime law. This influence of environmental law on nuclear law is quite obvious; bearing in mind that nuclear law's basic premise is the dual interests. Thus, the main concern of nuclear law is balancing risks with benefits; one of the main risks of nuclear operations is environmental damage. From this follows that nuclear law has integrated principles of environmental law.

In the following, five principles of nuclear law shall be discussed, in the light of that they may affect the rights of a third country, concerned by a specific transport. As they are based on a national perspective, it is interesting to consider to what extent the principles expressed also can be said existing in transboundary relations; however, the reader should keep in mind that the international arena is not as thoroughly regulated as the national and thus are not all of the discussed principles automatically applicable on transboundary relations. The principles that will be reviewed are the safety principle, the security principle, the compliance principle, the transparency principle and the principle of international cooperation.

The Safety Principle

Safety is naturally the main concern in any activity dealing with nuclear materials. To ensure that nuclear activities are safe, two objects are in focus; prevention and protection.[21] As nuclear materials potentially may cause harm irreparable in a foreseeable future, the main concern is to anticipate any risks, as to rule out accidents in beforehand. The meaning of the prevention principle is that caution should be taken to eliminate risks. However, as noted above, nuclear energy has a dual character. It is not possible to exclude all risk, and still enjoy the benefits of nuclear power. The principle of protection deals with this problem. The meaning of this principle is that any action by which risks are greater than the benefits should be ruled out.

As a conclusion, the safety principle does not preclude the taking of risks. It indicates that the level of precaution shall reflect the severity of the risk. It also indicates that some risks shall not be taken – those that are not compensated with a corresponding societal gain.[22]

A priori, the safety principle is reminiscent of the environmental precautionary principle, which is analysed in more detail below, in the section on environmental law. However, it shall be noted that even though the safety principle bears resemblance to the precautionary principle, the latter has a wider scope. The precautionary principle is an expansion of the prevention principle, often formulated as a reversed burden of proof.[23] In the example of transporting spent nuclear fuel, the precautionary principle would state that the shipper must prove that the transport will not damage the health or safety of people, animals or the environment.

Finally, it deserves to be repeated that the safety principle involves weighing benefits against risks. Some countries have decided that the risks involved in supporting nuclear power are too big. The degree of safety in others is nationally decided; taking into account existing

the international cooperation principle. See Stoiber *et al*, p 5.

21 Stoiber *et al*, p 6.

22 Stoiber *et al*, p 6.

23 Louka, E., International Environmental Law: Fairness, Effectiveness and World Order, Cambridge University Press, 2006, p 50.

international legislation. In the case of transboundary transportations, this is a source to conflicts as the non-nuclear countries are subjected to a risk lacking a corresponding national benefit.

The Security Principle and Coastal State trust

The security principle is concerned with preventing the abuse of nuclear materials. The tenor of this is that any country having nuclear materials must also make sure that it is not lost, stolen or used in a non-peaceful way.[24,25] The safety and security issues prompted by a transboundary transport of spent nuclear fuel are abundant and divergent. However, they can be roughly divided into a few different types of dangers. First of all there are the internal dangers of the material and the specific dangers of the maritime transport; this includes navigational errors, choice of route, hard weather etc. Precautionary measures include legislation on containers, packaging and control over external radiation levels.

Secondly, the risks posed by external actors – pirate or terrorist attacks knowing or unknowing of the cargo's nature. An example of the vulnerability of vessels to external interruption is the *Pacific Swan.* The vessel was boarded by members of Greenpeace on its way through the Panama Canal in 1998.[26] Although the environmentalists posed no threat to the journey as such, the incident served to put a focus on the malfunctioning of safety routines aboard the ship.

Moreover, for coastal states, another perceived threat is that of internal errors or misconducts on behalf of the transporters; in other words, that safety and security prescriptions are not properly executed. This has proven to be a rational fear – for example, in 1999 it was discovered that British Nuclear Fuels, shipping MOX fuel to Japan, had falsified many of their cargo safety inspection records.[27] The *Pacific Swan* incident mentioned above is another example.

As a conclusion so far, the security principle designates the shipper as responsible for making sure that safety and security is maintained until the ship reaches its destination. However, incidents show that coastal states not necessarily can trust that this responsibility is properly executed.

Does the security principle imply obscurity?

Security in nuclear law has long equalled secrecy. In this section, two examples shall be considered, illustrating how non-transparency can be motivated with the argument that it

24 It is worth noting that this does not only entail terrorist prevention. Several examples show how radioactive products that have been illegally dumped or abandoned without sufficient markings pose perhaps an even bigger threat. An example of this is the tragic Goiânia incident in Brazil in 1987; radioactive materials were left behind in a former radiotherapy institute. Scavengers found the material and tried to dismantle it, hoping to find something of value. Several people died or suffered severe symptoms after coming into contact with the material. The casualties were due to the lack of information – had it been known that it was a deadly substance, most likely, no harm would have been done. This is of course another argument in favour of transparency. Nuclear materials do have a tendency to do the most damage when handled by someone unaware of its hazardous nature. For more information on the Goiânia incident, see *"The Radiological Accident in Goiânia"*, IAEA, Vienna, 1988.

25 Stoiber *et al*, p 7.

26 Dixon, D. B., "Transnational Shipments of Nuclear Materials by Sea: Do Current Safeguards Provide Coastal States a Right to Deny Innocent Passage?", George Washington University, Paper 1794, bepress Legal Series, 2006, p 8 and O'Neill, K., "International Waste transportation: Flashpoints, Controversies, and Lessons." *Environment* 41, no. 4, pp 12-15, 34-39, 1999. See section "The Voyage of the Pacific Swan."

27 Dixon, D. B., p 9.

increases security. The first example to be considered is the US GNEP policy. Secondly, an example of security from a high risk perspective will be examined – transporting spent nuclear fuel through Colombia. However, it is interesting to also keep in mind the *Pacific Swan* incident and the falsified cargo safety protection protocols discussed in the previous section. Or in other words, secrecy in transporting nuclear materials rests upon one important premise; that the shipper follows internationally prescribed safety requirements in good faith. However, this has not always been the case in the past – so can *en route* coastal states and other stakeholders be sure that this is the case in the future; particularly if the number of actors and packages increase?

Due to nuclear law's historical background as a military research area, there has long been a tradition of absolute confidentiality. Due to the possible double usage areas for nuclear power (both peaceful and military purposes) this is to some extent still the case.[28] An example of this is the US GNEP policy. The point of this policy is to discourage potential nuclear weapon nations from creating such, by offering them to lease nuclear fuel for peaceful purposes. The creation of nuclear weapons demands apart from extensive knowledge in the field, a reprocessing plant. Therefore, the motivation goes, should only some countries, that already have nuclear weapons (such as the USA) reprocess nuclear fuel. Other countries (such as Iran) would be better off leasing fuel from other countries, not needing to invest in an expensive, complicated and dangerous facility. A collateral effect of this is that the chances of a leasing country to develop nuclear weapons of their own decreases; thus increasing chances that the non-proliferation goal is achieved.[29] As a conclusion, the GNEP is concerned with security on two different levels. Primarily, by keeping knowledge about reprocessing procedures secret and encouraging that reprocessing is only done in a few countries, security concerning nuclear weapons proliferation is increased. Secondly, as final depositories also will be limited to a few countries, the possibility that spent nuclear fuel deviates due to theft decreases. However, it shall simultaneously be noted that nuclear leasing programmes increase the length and number of hazardous transports.[30] It can be said that part of the risks that previously only concerned the leasing countries, is shifted on to the countries *en route* of the shipments.

It shall be noted though, that the GNEP is not an entirely new concept. The US Atoms for Peace program had a similar function; to repatriate spent nuclear fuel to the US, in order to prevent nuclear proliferation.[31] The repatriation of nuclear materials was however suspended during over a decade, due to US internal affairs; mainly the difficulties in finding a long term solution for storage of the waste.[32] In 1996, the program was partly resumed; one of the transports listed to take place was a shipment from a research reactor in Bogotá, Colombia, to the USA.[33] Colombia is a high risk country due to a combination of natural hazards and a high guerrilla activity. *Múnera et al* cites three main methods of decreasing the risks of transportation; confidentiality, low profile and disinformation. Furthermore they claim that a *"measure of the success of* [their] *strategy to guarantee confidentiality and low profile is given by the complete absence of news in the press."*[34]

28 Stoiber *et al*, p 6.
29 Beaufoy, M.,"Is the Law of the Sea ready for Nuclear Leasing?", Vol 3, pp 91-117, 2006, p 91-92. See also the GNEP homepage for more details about the program: http://www.gnep.energy.gov/gnepProgram.html
30 Lind, Johan, Lösning eller låsning – Frågan om kärnavfall i några länder, SKB, 2006, p 70.
31 Múnera, H. A., Canal, M. B., Muños, M.,"Risks Associated with Transportation of Spent Nuclear Fuel Under Demanding Security Constraints: The Colombian Experience", Risk Analysis, Vol. 17, No. 3, pp 381-389, 1997, p 381-382.
32 O'Neill, K., see Section"Reactivating U.S. Take-Back of Research Reactor Fuel from Abroad."
33 Múnera *et al*, p 381.
34 Múnera *et al*, p 388.

Múnera et al hence proposes the classical security argument in nuclear law, promoting secrecy. To put this into perspective, *Múnera et al* also reports that in one day, the guerrilla burnt 18 random trucks.[35] The transport of nuclear fuel luckily escaped this, as it was transported by air. However, transport by truck was also an option. The fact that the nuclear transport passed by unharmed seems to me largely depend on luck, something that is also alluded in the article. Hence, note that as no-one knew about the nuclear materials, it is quite possible that if a truck of nuclear materials was attacked by the guerrilla; harm would have been caused because the character of the cargo was unknown. At the same time, I accept the point made by *Múnera et al*, that knowledge of the cargo may well have prompted an attack, rather than deterring it. It is furthermore possible to argue that the great risk in this example is not an argument for secrecy, but an argument for publicity. According to the principle of transparency, which is discussed more in the next section, it is especially important to inform the public about circumstances that pose a risk to their health, safety or the environment.

Can dialogue substitute obscurity according to the security principle?
As seen above, there are well founded reasons why transports of nuclear fuel has taken place in secrecy in the past. However, there are also legitimate reasons why coastal states should be concerned about how transports take place. In national legislation, many countries have tried to solve this conflict with information to, and deliberation with stakeholders. Finally, it shall be noted that a dialogue between nuclear shipping states and coastal states may contrary to the tradition of obscurity, increase security. Through dialogue it would be possible to cooperate on issues such as choice of route, possibility of safe harbours or tugboats, should the sea or the weather indicate that this is necessary. Dialogue could also be a means for coastal states to gain insight in safety procedures; increasing their trust in that the manoeuvres are performed in good faith. They would also have a chance to institute special contingency plans, as to mitigate potential damages.

The Transparency Principle
It is difficult to address the transparency principle without mentioning the security principle as they historically have been considered to be in conflict with each other. Often, passing on information about something to the public also means that different security measures must be employed. Where the security principle draws on the military background of nuclear operations; the transparency principle is a product of the introduction of peaceful usage areas for nuclear power. Nuclear security has often been another word for confidentiality. Transparency on the other hand, is based on two premises. First of all, due to the hazards of nuclear operations, the public has a right to know about any incidents that may affect their safety or environment. Secondly, public resistance and fear is often considered to be based on insufficient knowledge; therefore, information is the main method of legitimizing the use of nuclear power.[36]

However, as hinted, the transparency principle is not a principle of total disclosure. The transparency objective shall rather be balanced with the other objectives of nuclear law, such as security and safety. At the same time, the nuclear industry have moved out of the shadow of military obscurity into the public sector resulting in that the public now has new demands on knowledge of any nuclear activity within their immediate surroundings.

35 Múnera *et al*, p 388.
36 Stoiber *et al,* p 10.

The Transparency Principle in the USA, Sweden and Germany

To grasp the meaning of how the transparency principle shall be interpreted it is useful to discuss a few examples on national level. However, since the issue of public deliberation in the context of national nuclear waste transportations would provide enough material for a thesis on its own, it shall be noted that the focus here is only to illustrate how the transparency principle may express itself locally. The reason why these examples are interesting to study in the case of transboundary transportation is that the risks involved are the same on both levels. The difference however is that in one case, stakeholders are national citizens and in the other, stakeholders are citizens of other countries. Hence, it is interesting to reflect upon how the right to information or deliberation changes when it is transformed from a national to an international transport. At this point, we shall briefly examine three examples of how the transparency principle has been used in three countries, USA, Germany and Sweden.

In an American context, it is *"widely recognized that a broad range of stakeholders and tribes should be involved in this kind of decision"*[37]. Issues that were considered in the study was the diversity of different stakeholders, the difficulties of communicating advanced technical information and a worry that stakeholders would not be willing to participate in a discussion. However, they did participate and Drew *et al* draw the conclusion that *"Meaningful involvement requires that decision processes and technical information be transparent and accessible to a wide range of potential participants."*[38] There is however no doubt that meanwhile there are difficulties in finding a suitable form for communication of information; information must be communicated before a decision is made, in accordance with the principle of transparency.

In contrast to this, there is the example of a decision to ship spent nuclear fuel to final storage in Gorleben, Germany. In this case, the government presented a finalised plan – something that awoke fierce opposition to the extent that the public authorities found it necessary to declare a moratorium and search for another solution.[39] What I wish to highlight with this example is not so much the fact that the lack of deliberation rendered this transport impossible. Rather, the point here is that although the German government knew that the decided transports was going to raise concerns among the public, there never seemed to be a doubt about that people had a right to know what was planned. Hence, although the German approach to transparency did not include deliberation, such as the American example above; public information was clearly a part of the German interpretation of a transparency policy.

In Sweden, investigation and deliberation on where to site a final storage and how to transport the spent nuclear fuel there has been going on for many years. Since 1999, focus has been on three areas selected for deeper studies.[40] The reports are published, including reports of questions asked in focus groups, public meetings and generally submitted from a concerned public.[41] This is a result of the Swedish environmental legislation[42] which prescribes that an

37 Drew, C. H., Grace, D. A., Silbernagel, S. M., Hemmings, E. S., Smith, A., Griffith,W. C,Takaro, T. K., Faustman, E. M., "Nuclear Waste Transportation: Case Studies of Identifying Stakeholder Risk Information Needs", Environmental Health Perspectives, Vol 111, No 3, pp 263-272, 2003, p 263.

38 Drew, C. H. *et al*, p 271.

39 O'Neill, K., see Section "Gorleben: Nuclear Transportation in Germany".

40 SKB R-01-28: Aggeryd, I.,"Transport av radioaktiva ämnen och annat farligt gods", Studsvik Eco & Safety AB, 2001.

41 SKB R-01-28: Supplement,"Transport av radioaktiva ämnen och annat farligt gods. SKB:s svar och kommentarer till frågor och remissynpunkter till utredningen ", Svensk Kärnbränslehantering AB, 2001.

42 Miljöbalk, SFS 1998:808 (The Swedish Environmental Code), Chapter 6.

environmental impact assessment[43] and a public consultation report[44] needs to be attached to any application to construct a storage area.[45] In the area of international transportation however, information to the public is still kept to a minimum, as noted in the press release from SVAFO cited in the introduction.[46] Although acknowledging that a transport is about to take place, time and route are unknown. Interestingly, however, they also state that "concerned authorities" will be kept informed. However, we have no way of knowing what countries that SVAFO considers to be concerned.

As a conclusion, it seems to vary how and to what extent countries find deliberation to be a part of the transparency principle. However, it seems that the transparency principle at a minimum at least includes the duty to prior information to the public. Returning to the reasoning above; if there is a duty of prior information to concerned national citizens, according to the transparency principle; does this not also imply that a similar duty should exist towards concerned citizens or governments, in the event of transboundary transportation? If this is not the case, is there a risk that safety standards are set at a different level for international transportation than for national?

Regulation through disclosure – an economic argument
Furthermore, drawing from environmental economics, there is also a third argument in favour of disclosing information about transports. As has been indicated in the section on the security principle; transparency can increase security, as it provides the shipper with an incentive to make sure that all safety and security prescriptions are followed in good faith. Hence transparency mitigates the chances of such incidents as the falsified cargo safety inspection records discussed above.

Many countries have recently applied different programmes to increase public disclosure of information relating to environmental damage; the Indonesian Program for Pollution Control Evaluation and Rating[47] and the U.S. Toxics Release Inventory Program[48] are examples of this. Common for initiatives of this type are that they try to discourage a certain behaviour that is contradictory to good environmental management through demanding that governments or corporations disclose information about any such actions to the public. It has been shown that the public exposure helps to decrease the amount of pollution, in combination with clear environmental legislation as a complement.[49]

In the case of transporting nuclear waste, an increase in actors on the market and of amounts of spent fuel transported can be observed. Already today, the spent fuel market is characterised by a mixture of state and private actors.[50] As actors become more abundant, chances are that not all of them attend to international safety and security legislation. One way

43 Swedish translation: "Miljökonsekvensbeskrivning" (also known as MKB).
44 Swedish translation: "Samrådsrapport".
45 For a condensed description of the demands of the Swedish Environmental Code applied to nuclear facilities, see http://www.skb.se/default2____15521.aspx
46 See press release from AB SVAFO, 2007-06-05, www.svafo.se. However, on a side note; transboundary transports of spent nuclear fuel so far have been an exception in Sweden. National policy provides for self sustainability in the field of nuclear energy; clearly, exporting waste does not conform well to this view.
47 For a detailed analysis on this, see García, J., Essays on Asymmetric Information and Environmental Regulation through Disclosure, Economic Studies, Department of Economics, School of Business, Economics and Law, Göteborg University, 160, 2007, chapter 2 and 3.
48 Cohen, M. A. and Santhakumar, V., "*Information Disclosure as Environmental Regulation: A Theoretical Analysis*", 2006. Available at SSRN: http://ssrn.com/abstract=922487, p 2.
49 Cohen, M. A. and Santhakumar, V., p 24.
50 O'Neill, K., see concluding section.

of combating the problem of internal error is to demand that information about safety measures and choice of route to the public or at least to concerned governments along the route. This way, shippers will be extra careful, as to not violate any regulations and thereby receive unwanted negative attention from stakeholders. At the same time, the transparency will allow stakeholders to gain insight into how the transports are performed; resulting in increased legitimacy. Another effect that has been noted is that using a system of disclosure gives actors an incentive to want to perform better, rather than on par with regulations.[51] Hence, a transparent system may lead to that actors on their own initiative take more precautions than legally prescribed.

As can be seen, viewed from this perspective, transparency reinforces security, rather than risking it. As the public is watching, chances are higher that safety and security regulations are followed.[52] Perhaps absolute confidentiality increases chances that terrorists or other disruptions based on outer influence are avoided. This opinion seems to gain followers as fear of terrorist attacks has increased in the wake of the September 11, 2001 incident.[53] However, first of all, due to the complexity and the number of parties involved in a transboundary transport of spent nuclear fuel, chances are that it will be difficult to keep secret and that information will leak. Secondly, confidentiality does not protect from internal mistakes; these have previously proven to pose no less a threat to the transport of nuclear materials than outer disruptions. Especially as the success of an outer disruption in the end is dependent on what internal safety measures that are taken. By disclosing information to the government and/or public of countries along the itinerary; the risk of internal errors are diminished as chances are that someone will discover and question them before the journey starts.

Not-in-my-back-yard-symptom[54] or informed consent?

As the above examples on the transparency principle show, there are good reasons to why a shipment should be preformed following prior information or perhaps even a prior informed consent, rather than being completed in secret. However, there are also good reasons to why transporters would want to keep secrecy and to keep the number of involved parties and stakeholders to an absolute minimum. The above examples from the USA, Sweden and Germany show that national stakeholders are kept informed of transports, and in some cases even are invited to deliberate and thereby influence on the decisions. However, it is important to mention also that as much as these deliberations try to legitimize certain transports or choices of final storage sites; all nuclear power countries have a problem with finding local support for the construction of a final depositary.[55] In other words, when people are informed of the risks and benefits, there is a tendency that they evaluate the risks taken differently and use their knowledge or influence (should they be invited to participate in the deliberation) to stop the transport.

This is probably one of the main reasons to why shipping countries does not wish to surrender to the idea that *en route* coastal states may influence shipments in advance. Should they have this right, and should they all subscribe to a different evaluation of the risk; could they in principle render transports impossible. Should they not have this right, advance information

51 Cohen, M. A. and Santhakumar, V., p 24.

52 Dasgupta, S., Wang, H., Wheeler D. R., "Disclosing Emissions Information Helps Check Pollution in Asia" Available at: http://go.worldbank.org/FVA43SX4C0

53 Sand, P. H., The Right to Know: Environmental Information Disclosure by Government and Industry, Institute of International Law, University of Munich. Available at: http://www.inece.org/forumspublicaccess_sand.pdf, p 7.

54 For further details on the NIMBY attitude, see for example Louka, E., p 424.

55 O'Neill, K., see concluding section.

may still prompt a country to stop the shipment, notwithstanding that international law did not grant this right. Hence, informed consent may stop a transport already before it has departed; prior information may lead to that the informed country intercepts the route during the actual transport. What the actual delimitations provided by international law are will be discussed in Chapter 3. At this point it is enough to note that opinions differ on this question; shipper fear of interception is therefore rational simply with reference to the legal insecurity of the area.

The Compliance Principle and the Principle of International Cooperation
Finally, there are two principles concerned directly with the external relations of a state. The signification of the compliance principle is that a country has a duty to implement and comply with international agreements.[56] Furthermore, it is said to also contain the customary law that indicates that no country is allowed to use its own land in such a way that it adversely affects another country's sovereignty. The customary rule of state sovereignty will be discussed in more detail in the section about environmental principles.

The principle of international cooperation is closely corresponding to the compliance principle. Where the compliance principle prescribes that a country must make sure that international legislation is implemented and followed; the cooperation principle refers to the nation's duty to collaborate with other countries to make sure that the international legislation properly addresses all issues of importance to keep up safety and security of nuclear enterprises. The principle also means that countries should exchange knowledge in these areas to promote safety and security; and that they shall cooperate to make sure that nuclear materials does not end up in the wrong hands.[57] This principle will be further addressed, in the section on environmental law.

Conclusions
This section shows that nuclear law is based on a balance of interests; the dual focus of nuclear law. However, one can conclude that although that nuclear countries obviously balance the benefits of nuclear power with its risks; not all countries have come to the conclusion that the risks of nuclear power can be outweighed by its benefits. Hence, what creates a problem in the field of international transportation of spent nuclear fuel is that the transports expose other nations to a risk which they may have opted out from nationally.

Next, the safety principle, the security principle and the transparency principles was reviewed. The three principles were found to be intertwined, but not necessarily in coherence with one another. It was found that the dual usage areas of spent nuclear fuel and nuclear law's history of being a confidential military subject has affected how security has been interpreted. It was shown that there are benefits to secrecy; mainly that obscurity reduces resistance from external actors. At the same time, the secrecy was found to lead to less legitimacy and the chance for internal errors is feared to be larger. Hence, it was seen that a dialogue between the shipping/destination states and the concerned coastal states may in fact contribute to increase security as well as ameliorate the coastal states legitimate concerns. However, it was also noted that promoting early information does not necessarily lead to that stakeholders' resistance diminish.

Finally it was noted that there are two principles in nuclear law that promote the maintenance and development of international cooperation and exchange of information; the principle of compliance and the principle of international cooperation. These principles are also found in

56 Stoiber *et al,* p 9.
57 Stoiber et al, p 10-11

other areas of international law and will be further addressed in the section on environmental principles.

2.3. Background to Navigational Rights

The indivisibility of the oceans
Maritime law is an area of law that is comparatively well regulated on a global level. Many of the existing rules are deemed to be close to universal, due to their high level of acceptance. Although the UNCLOS is restating the main rules of navigation and the jurisdictional division between flag and coastal states, these are also considered to be a part of international customary law; hence considered to be evocable even towards the few countries that are not parties to the convention.[58]

The unusually global character of maritime legislation can in a simplified way be explained as a consequence of two facts relating to the indivisibility of the oceans. First of all, there is the pollution argument. Ships are not stationary; the threat of pollution is therefore not restricted to a certain area, as is the case concerning for example nuclear plants. As an example, the Barsebäck power plant, situated in the south of Sweden, was a concern mainly for Denmark and Sweden. As it was situated close to the Danish capital; it was considered a threat to Denmark. However, as it concerned only Denmark and Sweden, the issue could be resolved through bilateral communication. Consider then the case of a shipment of spent nuclear fuel, for example, from Japan to France. The ship is then a mobile environmental hazard[59], concerning in turn not only Japan or France; but all countries that are transited or whose coastlines are passed by, in order to reach the destination. The need for a global legislation is then obvious.

Secondly, and perhaps historically more important, the global character of maritime legislation can be explained as a consequence of convenience. It would be impracticable, not to say impossible, for sea captains and their crews to adhere to new rules and demands, every time they sailed into a new country.[60] To facilitate naval operations, the need for a global uniformity in maritime transportations has long been a priority.

Finally, it shall be noted that the global character of maritime law has also proved to be a limitation, when it comes to improving environmental standards. As much as the global rules set a global standard to the benefit of the environment and to facilitating naval transports and therefore also furthering economic interests; such a standard is a maximum standard. It is difficult to unilaterally raise environmental demands. This is both a consequence of that the international maritime regime does not encourage unilateral measures as well as that the mobility of ships makes it easy for ship owners to escape such measures by registering their vessels under another country's flag. However, notwithstanding these difficulties, the current trend is towards increased environmental control. In the case of oil tankers, for example, the international development followed as a consequence of that some countries first decided to take unilateral measures.

58 Ringbom, H., Preventing Pollution from Ships – Reflections on the 'Adequacy' of Existing Rules, Review of European Communities & International Environmental Law, Volume 8 Issue 1, 1999, p 21-22.
59 Ringbom, H., p 22.
60 Ringbom, H., p 21.

Permanency

When the final draft of the UNCLOS was opened to signatures on the 10th of December 1982 it put an end to centuries of debates on the issue of who controls the oceans and what rights can be claimed by different parties such as coastal states, port states or flag states. However, the principle of freedom of navigation on the high seas and innocent passage through territorial waters was already before accepted as a part of international customary law. Or rather, there was the "freedom of the seas"-doctrine; reserving narrow coastal waters to the control of the coastal states, all the rest of the oceans were perceived to belong to no-one.[61] This doctrine never passed unchallenged, claims to own the sea has during the centuries been put forward by a multitude of countries ranging from a decision by Pope Alexander VI in 1494 to divide the Atlantic between Portugal and Spain to the early 20'th century's disputes over continental shelves, fishing waters *et cetera* that triggered the idea of creating a Law of the Sea.[62]

The disagreements during the creation of the UNCLOS mainly concerned to what distance from the coast these areas actually were, as well as how to regulate international straits and archipelagic states. Hence, the problem was not if there should be a right to freedom of navigation and innocent passage, but how these rights should be exercised. The UNCLOS therefore served partly as a tool for harmonization and partly as a restatement of already accepted principles.[63] The result is that the UNCLOS strikes a delicate balance between the rights of coastal states and flag states; dividing the right to regulate and control ships between them.[64]

It can thus be concluded that the principles of freedom of navigation and innocent passage has long existed embedded in the "freedom of the seas"-doctrine, but it is worth noting that the exact meaning of the principles have varied over centuries of seafaring. Although the current interpretation is perceived permanent, it too was initially constructed from a background of disparate opinions.[65] This is an aspect to remember when analyzing to what extent the UNCLOS may and should be adjusted to other evolving interests. A second aspect to consider is if it is adaptable to new situations without having to revise the actual convention; in other words, does the UNCLOS have a built in flexibility?

Flexibility

The goal when drafting the UNCLOS was to produce "a constitution for the oceans"[66]. Hence, it provides a basic framework of legislation to all maritime affairs; including the transport of spent nuclear fuel, to the extent it is not specifically regulated elsewhere. All matters of the sea was to be included without infringing on the sovereignty of states and at the same time providing flexibility preventing the legislation from becoming outdated over time.[67] A

61 *The United Nations Convention on the Law of the Sea (a historical perspective),* see Section "A historical perspective".

62 *The United Nations Convention on the Law of the Sea (a historical perspective),* see Section "Setting limits".

63 *The United Nations Convention on the Law of the Sea (a historical perspective),* see Section "A historical perspective" and Section "third United Nations Conference on the Law of the Sea".

64 The UNCLOS also address other aspects of seafaring, such as fisheries, the seabed and maritime research, *et cetera*. However, these issues are not of direct interest to the subject matter of this thesis and will therefore not be further discussed.

65 This is based on a social constructivist interpretation of the nature of law. For a theoretical background see Bladini, Filip, and Glavå, Mats in Gamla och Nya perspektiv på transporträtten, Red. Svante Johansson, Svenska Sjörättsföreningen Skrifter 78, Jure AB 2003

66 *"A Constitution for the Oceans",* Remarks by Tommy T. B. Koh, of Singapore, President of the Third United Nations Conference of the Law of the Sea

67 The Law of the Sea – United Nations Convention on the Law of the Sea, Agreement relating to the

manifestation of this flexibility is seen in the frequent references to international instruments outside of the UNCLOS itself; thus providing for changes in particular areas without the need to revise the entire UNCLOS. However, this possibility to provide changes shall not be overestimated, as it usually comes with the qualification that the instrument in question shall be in accordance with the UNCLOS or that it is adopted by a competent international organization; in most cases, the IMO.[68] However, an example of how the UNCLOS have allowed for increased environmental legislation can be seen in the area of oil tankers.

Although free navigation and innocent passage combined with flag state rights to legislate over its registered fleet long presided over the rights of coastal states to protect their coastlines, this has gradually changed. Due to that some flag states have lenient legislation or lack of control over the implementation of international conventions, some unseaworthy vessels started to fly so-called flags of convenience. This resulted in a few notorious accidents involving oil-tankers, such as the Torrey Canyon off the Cornwall coast in 1967, Exxon Valdez, 1989 in US waters, or recently the Erika in 1999, outside the coast of Brittany. In these cases, the coastal states found themselves helpless to the fact that the flag states had not done enough to control the safety and standard of their fleet. Hence, the balance of powers between coastal states and flag states has been increasingly strained during the recent years.[69] The development has lead towards increasing powers of the coastal states as the governments of the countries affected by the disasters imposed stricter environmental legislation. Hence, the right to freely sail the oceans has gradually been circumvented to the advantage of coastal states.

It shall be noted though, that the legislative changes when it comes to oil tankers were possible by the use of port state regulations.[70] As the tankers where destined to call certain ports; they had to fulfill the standards put up by that particular port. When it comes to oil tankers, eventually also the international regulations caught up with the stricter national, US and EU legislations, hence again reducing the port/flag/coastal state tension. However, when it comes to spent nuclear fuel, such a development is hardly likely, as a nuclear transporting ship usually never calls any other ports *en route* to the port of destination; which in turn has provided prior consent, and is thus usually in joint interest with the shipping state.

Conclusions

Concluding this section, we find that the principles of freedom of navigation and innocent passage, as they are expressed in the UNCLOS, have reached a state of acceptance that evokes a perceived permanency. With the creation of the UNCLOS the principles meaning was disambiguated; resulting in that what used to be a multitude of regional solutions and solutions in different historical contexts were harmonized into one signification. This one signification is in turn given historical weight, and the concepts of freedom of navigation and innocent passage in their final meaning according to UNCLOS is perceived as perennial. This means that the UNCLOS principles of freedom of navigation and innocent passage have become internalised in the international legal system to the extent that their permanence is no longer questioned. The fact that the navigational rights are perceived to represent customary

Implementation of Part XI of the United Nations Convention on the Law of the Sea with Index and excerpts from the Final Act of the Third United Nations Conference on the Law of the Sea, Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations, New York 1997, page 1-2

68 *The United Nations Convention on the Law of the Sea (a historical perspective),* see Section "Protection of the Marine Environment".

69 Sage, B., Precautionary Coastal States' Jurisdiction, Ocean Development & International Law, 37:359-387, 2006, p 361

70 Ringbom, p 23.

law confirms this standpoint.[71]

To say that the principles of freedom of navigation and innocent passage are unquestioned is of course an exaggeration, but it illustrates the difference in type between the principles of the UNCLOS and some evolving environmental principles, such as the precautionary principle that will be introduced next. It shall only be noted here that many claim that environmental principles have not yet settled in the sense that they have reached a state of permanency; there are still a multitude of principles and ideas, which are introduced into classical areas of law, such as the maritime law.[72] How to weigh for example the precautionary principle against the principle of innocent passage is yet to be determined.

Finally, it is important to keep in mind that when the UNCLOS was created, it was meant to be flexible; as to not break under the weight of time. Within the UNCLOS there are constructions that are meant to facilitate changes. An example of this is the recent decades increase in controlling the seaworthiness of oil-tankers, as discussed above. However, opinions differ on what the size and design of this room for manoeuvre within the UNCLOS is. This topic shall be returned to in detail below, in Chapter 3 where the articles of the UNCLOS are analysed.

2.4. Background to Environmental Law

The purpose of this chapter is to introduce the relevant legal principles of international environmental law and their relation to other areas of law. Obviously, all principles of environmental law can not be addressed here; I have chosen a selection of those who may have an impact on transboundary transports of spent nuclear fuel. The principles that will be discussed more in detail are the principle of State Sovereignty, the principle of cooperation, the Preventive Principle and the Precautionary Principle. As shown above, the three first of these principles were already mentioned in the introduction to nuclear law. Hence, it shall be noted again that nuclear law has integrated many environmental aspects of law. When it comes to the precautionary principle, on the other hand; it is not obvious what status it shall be said to have achieved.

However, to begin with, environmental law shall be addressed on a more general level; to illustrate that there are different kinds of principles that can be actualised within the environmental field. There is a difference in purpose and level of international acceptance between them. Secondly, the above mentioned principles will be introduced and evaluated in relation to the transboundary transport of spent nuclear fuel.

Principles of Environmental Law
The environmental principles that will be discussed in this section can roughly be divided into two groups. The principles of cooperation and state sovereignty are both identifying what duties and rights that nations have towards each other when it comes to environmental pollution. These are also the more classic principles of environmental law; stemming from international customary law and state practice.[73]

71 Ringbom, p 22.
72 Theoretical background from Bladini, Filip, and Glavå, Mats in Gamla och Nya perspektiv på transporträtten, Red. Svante Johansson, Svenska Sjörättsföreningen Skrifter 78, Jure AB 2003
73 de Sadeleer, N., "Environmental Principles, Modern and Post-modern Law", Principles of European Environmental Law, ed. Macrory, R., Chapter 14, Europa Law Publishing, 2004.

The principles of prevention and precaution are both principles relating to how to control and assess the risks of a certain measure. The latter can be said to exist within a risk management system consisting of three degrees of caution. *de Sadeleer* calls these three levels the curative model, the preventive model and the anticipatory model.[74] The curative model corresponds to the Polluter pays principle and represents the view that after damage has been made, the culprit must be responsible for repairing the damage. The preventive principle is a logical step towards a heightened preparedness for certain damage. It makes sense that when damage can be predicted, it is better to prevent it than to repair it once it has occurred. Especially, as many damages may not be repairable, such as the extinction of a certain animal or plant, or the destruction of a rain forest. Finally, the anticipatory model is a result of that all damage can not be predicted. When damage can not be predicted, the preventive principle is powerless; therefore the anticipatory approach suggests the precautionary principle, or in other words, that when in doubt, one should refrain from taking a certain measure. Hence, the Polluter pays- , the prevention- and the precaution principle stems from the same idea of risk management, however they operate at different degrees. Furthermore, the principles exist parallel to each other, rather than being evolutionary steps of the same principle; there is no restriction to applying them all at once, should that be motivated.[75]

As a conclusion, it shall be kept in mind that the environmental principles discussed in the following are intrinsically different. The state sovereignty principle and the principle of cooperation are old, customary rules, in other words, a product of classical international law. Also the preventive principle is usually considered to be part of international customary law. The precautionary and preventive principles are grounded directly upon care for the environment, rather than being a product of the nation states sovereignty, as are the other two. Thus, although the state sovereignty principle and the principle of cooperation are well established; their main purpose is not to protect the environment, but to protect the sovereign rights of the nation state. The precautionary principle and the preventive principle on the other hand, may be more suitable for environmental concerns, since that is what they are constructed for. But particularly the precautionary principle is not as clearly defined and its status in the international community is more insecure. In the following the principles will be introduced with focus on how they could be used to increase coastal state control over *en route* shipments of radioactive materials.

The Principle of State Sovereignty/Obligation not to cause damage[76]

This principle is expressed in Art 21 and Art 2 Stockholm Declaration.[77] It consists of two parts, namely the sovereign right of states to exploit their own resources and the duty to make sure that this does not result in transboundary damage.[78] These rights and duties are considered to be international customary law, as illustrated in the *ICJ Nuclear Weapons-case*, section 29:

> The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment.[79]

74 de Sadeleer, N., Environmental Principles – from political slogans to legal rules, pp 15-19.
75 de Sadeleer, N., Environmental Principles – from political slogans to legal rules, p 19.
76 Will hereinafter be referred to as "the sovereignty principle".
77 Declaration of the United Nations Conference of the Human Environment, Stockholm, 1972.
78 Stockholm Declaration, Art 21.
79 Advisory Opinion of the ICJ on The Legality of the Threat or Use of Nuclear Weapons, General List No. 95, 8 July 1996, section 21.

Thus, there is a binding obligation not to cause transboundary harm. The definition of environmental harm and what degree of harm or risk that is acceptable is however not clear.[80] In the case of coastal state influence, it is interesting to find whether or not the sovereignty principle covers risk of damage, or just executed damage. Secondly, can the obligation not to cause damage include a prior consent or at least prior information to the coastal state? Finally, one may think of it in the opposite way; as Yemen does in their reservation to the UNCLOS.[81] They reserve the right to demand a prior consent, referring to their state sovereignty according to international law; thus they consider themselves to have the right to limit the navigational freedom due to this principle.

In the *Trail Smelter case,* it is stated that no country may cause damage to another over the boarder as to cause injury by fumes. However, it was also decided that Canada needed to prevent future damage, by implementing a regime of control.[82] Thus, in this case it was a matter of stopping ongoing contamination (fumes) but also prevent the risk of future damage.

In the *Lac Lanoux Arbitration*[83] Spain claimed that a certain measure proposed by France could affect their environmental rights and thus, they argued, no decision could be taken without prior consent from Spain. However, the tribunal decided that no prior consent was needed, but that the Spanish interests still should be respected. Presumably the outcome of the case was affected by the fact that Spain and France already had an agreement on the issue; although Spain claimed that France was in breach. Therefore, it can not be ruled out that in another case, the taking into account of another countries right may involve prior consent or at least, notification.

Concluding this discussion on the principle of sovereignty and obligation not to cause damage to other states, it seems uncertain if it can be used on its own to defend a coastal states ban of nuclear vessels, or a demand for information or prior consent. Perhaps in the combination with the principle of cooperation, could it be used to further this goal? If there is a duty to not cause transboundary damage, and a duty to cooperate in anticipation of transboundary environmental issues, the combination could be said to include at least a duty to inform a state through the waters of which one intends to traverse, carrying radioactive cargo.

The Principle of Cooperation

Similar to the principle of sovereignty, the principle of cooperation is also expressed in the Stockholm Declaration, in principle 24. The principle is widely recognised to have support in customary law, concerning hazardous activities.[84] The principle evokes quite generally a duty for states to cooperate, though the scope of cooperation is described differently depending on the situation at hand. However, common denominators seem to be exchange of information, notification and consultation when it comes to transboundary issues.

The principle can also be found in the *Lac Lanoux* case reviewed above; however, Spain was not acknowledged the right to prior consent. This however shall not be seen as decisive, as the circumstances in the *Lac Lanoux* case were specific; consultation had in some sense already taken place.

80 Sands, P., p 241.
81 See Appendix I for excerpts from the list of reservations to the UNCLOS, including Yemen.
82 Trail Smelter case, United States v. Canada, 3 RIAA 1907, 1941.
83 Lac Lanoux Arbitration, Spain v. France, 12 RIAA 285, 1957.
84 Sands, P., p 249.

The principle of cooperation was also an issue in the *Gabčíkovo-Nagymaros Project* case[85], where the parties where ordered to cooperate through meaningful negotiations.[86] However, what this cooperation actually should consist of was not further specified.[87] As will be seen below, the principle of cooperation is also central to the *MOX plant case*. Finally, both these cases also address the preventive principle, thus judging from the discussion so far, it is difficult to separate the environmental principles as one often invokes another.

The Preventive Principle
The principle of prevention is also considered to be a part of international customary law; it has been confirmed in the *Trail smelter case* as well as in the *MOX plant case* and in the *Gabčíkovo-Nagymaros Project* case, all discussed above. The meaning of the preventive principle is to prevent damages that can be foreseen.

Thus, it is related to the sovereignty principle, but differs, as was reflected upon in the introduction to this section, from the latter since it is not a consequence of state sovereignty but of environmental concerns. Thus it has a wider scope than the sovereignty principle; it does not only prescribe that a county shall not engage in transboundary pollution, it also demands that pollution within the national boundaries must be prevented.[88]

However, the preventive principle only prescribes that damage that can be foreseen shall be prevented. To what extent this shall be done is unclear. For example, the damages caused by a nuclear accident are considered to be grave. But at the same time, chances that an incident occurs are small, though not negligible. Thus, there is an element of uncertainty when it comes to ascertaining the risk. Furthermore, different countries may understand the graveness of a threat in different ways. This indicates that information and consultation between concerned countries may contribute to determine to what degree preventive action must be taken. One of the reasonable steps of prevention may actually be to inform other states, to allow them to take safety measures of their own, and thus increasing security.

The element of uncertainty is sometimes said to be characteristic for the twenty-first century society, a world of global risk.[89] However, the fact that a risk is not scientifically ascertainable does not necessarily mean that it is a problem that can be postponed into the future. Locating a terminal storage for nuclear fuel and preventing global warming are issues that most people find important, although it is uncertain to what extent current and future generations are affected. Similarly, the consequences of genetically modified foodstuffs are yet to be determined. Applying the preventive principle, one may reach the conclusion that these issues do not entail damages that can be anticipated and thus, the principle is not applicable. Concern over this has induced the precautionary principle, which will be discussed next.

The Precautionary Principle
The purpose of the precautionary approach is to ameliorate the problem of countries choosing not to act in protection of the environment with reference to lack of scientific certainty or in trust of the environments ability to regenerate itself. Thus, the difference between the prevention and the precaution principle is the certainty of risk. The preventive principle operates with measurable scientific certainties; the precautionary principle is preoccupied

85 Gabčíkovo-Nagymaros Project (Hungary/Slovakia), Judgement I.C.J. Reports 1997, p 7.
86 Gabčíkovo-Nagymaros Project (Hungary/Slovakia), Judgement I.C.J. Reports 1997, p 7, p 83.
87 Gabčíkovo-Nagymaros Project (Hungary/Slovakia), Judgement I.C.J. Reports 1997, p 7, p 78.
88 de Sadeleer, N., Environmental Principles – from political slogans to legal rules, p 64 and Sands, P., p 246.
89 Mason, M., p 1-2.

with uncertain risks, or suspected risks, not yet proven beyond a doubt.[90]

A definition of the precautionary principle that is often cited is Principle 15 of the Rio Declaration:

> In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.[91]

This definition is quite vague and the principle has accordingly been interpreted in a range of different ways; on one hand, it is claimed to shift the burden of proof on to the active party, to prove that the suggested actions are not endangering the environment. On the other side of the scale, for example *Sunstein*, suggest that the precautionary principle shall be interpreted as an "Anti-Catastrophe Principle"; in other words, the maximin principle.[92]

Since a decision in accordance with the precautionary principle, without certain scientific proof may prove to be both costly and faulty, the application of the precautionary principle is controversial; while some find that it has *"become a full-fledged and general principle of international law"*[93], others find that it is a trade protectionist measure at best.[94] Sunstein draw a parallel to the war in Iraq; described as a pre-emptive measure and claim that the precautionary principle, in its extensive interpretation is little more than a pre-emptive strike.[95] As a contrast to this sceptical approach, the precautionary principle is implemented in Art 174.2 EC Treaty and shall serve as a base for all the commissions' activities.

It is therefore not quite clear what the precautionary principle entails in respect of actual obligations. In the narrowest interpretation it concludes that the extent of the precautionary measures increase, the bigger and more devastating a potential risk is deemed to be. This implies that to gain a reasonable knowledge of the risk is mandatory, otherwise it is hard to know what precautionary measures that are suitable. Hence, in the basic interpretation of the precautionary principle, there seem to be a demand for environmental research and evaluation.

Van Dyke claims that the precautionary principle among other things demands an environmental impact assessment and the notification and consultation of concerned parties.[96] According to the Commission, the precautionary principle within the EC may entail reversing the burden of proof, but not in all situations.[97] Furthermore, its application within the EC includes taking into account the principles of proportionality, non-discrimination, consistency and examination of the benefits and costs of action or lack of action; although in the latter case public health shall always be prioritised over economic advantages. Thus, it seems like the precautionary principles is a widely defined term; its contents seemingly adjustable to the situation. This is an interpretation in line with *de Sadeleer's* opinion that the precautionary

90 de Sadeleer, N., Environmental Principles – from political slogans to legal rules, p 75 and 91.
91 Rio Declaration on Environment and Development, 1992, Principle 15.
92 Sunstein, C. R., Laws of Fear – Beyond the Precautionary Principle, Cambridge University Press, 2005, p 109.
93 COMMUNICATION FROM THE COMMISSION on the precautionary principle, COM/2000/0001, Ch 4.
94 See the U.S. opinions in WTO DS26: EC Measures Concerning Meat and Meat Products (Hormones)
95 Sunstein, C. R., p 4.
96 Van Dyke, J. M., "Applying the precautionary principle to Ocean Shipments of Radioactive Materials" 38 Ocean Dev. & Int'l L. p 379, 1996.
97 COMMUNICATION FROM THE COMMISSION on the precautionary principle, COM/2000/0001, Ch 6.4.

principle is, in his words, a post-modern legal rule and thus a directing principle to be used as a pair of coloured glasses to interpret other legislation, rather than being a general principle deducted from case law, with an exact content.[98]

Hence, it seems reasonable to look further into how the precautionary principle has been interpreted specifically in relation to marine transportation. It has, as a matter of fact, also to a great extent been applied in the field of marine pollution.[99] Thus, it is perhaps not strange that it is frequently mentioned in the case of transboundary shipments of spent nuclear waste. The relationship between the UNCLOS and the precautionary principle is specifically addressed in the objectives of Chapter 17.22 Agenda 21:

> States, in accordance with the provisions of the United Nations Convention on the Law of the Sea on protection and preservation of the marine environment, commit themselves, in accordance with their policies, priorities and resources, to prevent, reduce and control degradation of the marine environment so as to maintain and improve its life-support and productive capacities. To this end, it is necessary to:
>
> a. Apply preventive, precautionary and anticipatory approaches so as to avoid degradation of the marine environment, as well as to reduce the risk of long-term or irreversible adverse effects upon it;[100]

Again, we find a very broad description of the precautionary principle; although the Agenda 21 is no binding document of law, this is an indication on in what direction the international community wish the legal development to move.

The precautionary principle was, although not explicitly mentioned, one of the issues in the *Southern Bluefin Tuna Cases*[101]. In the cases New Zealand and Australia are concerned that Japan has breached against its obligations according to the UNCLOS by using experimental methods in fishing tuna. The Japanese main defence is that there is no scientific evidence that indicates that their method is bad. However, the order was in favour of the claimants. It is furthermore stated in Judge *ad hoc* Shearers separate opinion that "*The Tribunal has not found it necessary to enter into a discussion of the precautionary principle/approach. However, I believe that the measures ordered by the Tribunal are rightly based upon considerations deriving from a precautionary approach".*[102]

A similar approach is taken by Judge *ad hoc* Székely, in the MOX plant case, where he concludes that he "*fully share the same opinion regarding the Tribunal's alternative provisional measures that it ordered in this case"*, referring to the above cited opinion by Judge *ad hoc* Shearer.[103]

It shall also be added that both the *MOX plant case* and the *Southern Bluefin Tuna Cases* ordered that the parties should cooperate and thus share information to work out a common solution. Whether or not this stems from the principle of cooperation is not that important; it is naturally possible to apply more than one principle to support a case. However, as the precautionary principle seems to have been silently applied in the above cases, in combination

98 de Sadeleer, N., "Environmental Principles, Modern and Post-modern Law", Principles of European Environmental Law, ed. Macrory, R., Chapter 14, Europa Law Publishing, 2004, Section 4.3.

99 de Sadeleer, N., Environmental Principles – from political slogans to legal rules, p 94.

100 Agenda 21 - Global Programme of Action on Sustainable Development, UNCED, 1992.

101 Southern Bluefin Tuna Cases (Australia v. Japan; New Zealand v. Japan), Provisional Measures, Cases No. 3 and 4, ITLOS.

102 Separate opinion of Judge *ad hoc* Shearer, Southern Bluefin Tuna Cases (Australia v. Japan; New Zealand v. Japan), Provisional Measures, Cases No. 3 and 4, ITLOS.

103 Separate opinion of Judge *ad hoc* Székely, the MOX Plant Case (Ireland v. United Kingdom) Accessible on http://www.itlos.org/cgi-bin/cases/case_detail.pl?id=10&lang=en#order

with Art 17.22 Agenda 21, it seems like the precautionary principle may have earned a place as a tool of interpretation when assessing the articles of the UNCLOS.

Concluding this section on the precautionary principle, it has been found that the extent of this principle is quite uncertain. It enjoys a special status within the EC; but in the international community it can not be said to have reached the status of a customary law. It is also uncertain what scope the principle has, something that is different depending on the area of use. However, taken to mean a reversed burden of proof; the principle demands that the shipper of nuclear materials prove to all *en route* coastal states that they have taken sufficient measures of precaution.

It has also been taken into account, although not expressly, when construing the rights and obligations provided for by the UNCLOS. Thus, it is possible that it may be used as an argument by concerned coastal states, to demand increased influence on shipments of spent nuclear fuel.

2.5 General conclusions on principles concerning naval transport of nuclear materials

After reviewing the principles in nuclear law, environmental law and maritime law that may affect *en route* countries right to influence, it seems that on a principal level, maritime law is the largest obstacle; or more specifically, the principles concerning freedom of navigation and innocent passage. Nuclear law, although historically favouring confidentiality, is mainly concerned with ensuring that transports are safe and secure, whilst taking into account that a certain degree of risks are acceptable, as long as it is connected to a corresponding benefit. Environmental law may provide some support to the *en route* countries. The principle of cooperation, sovereignty and prevention are all considered to be general principles of international law. It is not impossible that a combination of these principles may give coastal states a right to information and perhaps even prior informed consent. It is still difficult to motivate a total ban, however. Similarly, the precautionary principle may provide some guidance when construing the UNCLOS; however at the same time, it must be remembered that it is enjoying a different status within the EU than in international law.

The principles of innocent passage and free navigation are likely to oppose any demand from a coastal country that they need prior information on a certain transport, or that they ban some or all transports carrying spent nuclear fuel. At the same time, we have concluded that the UNCLOS has a certain built in flexibility. The degree of flexibility is however uncertain. Perhaps the UNCLOS can be bent to fit together with the above discussed environmental principles, thus providing coastal states with a right to influence within the existing matrix of international maritime law. Thus, the next chapter begin with a review of what legislation that controls transboundary transports of spent nuclear fuel in the UNCLOS.

3. LEGISLATION APPLIED AND CASE LAW ANALYSIS

3.1. Introduction

After reviewing what principles of law that may be evoked by the question of what possibilities that an *en route* coastal state has to be informed about, and influence on, a certain shipment of spent nuclear fuel; it is now time to pursue the actual legislation. The previous chapter has hopefully served to provide the reader both with a motivation to why a coastal state may want to have information and control over shipments of spent nuclear fuel, as well as with a general sense of where problems are likely to arise, on a principal level. The purpose of this chapter is to find the law in force; but also on a wider scale, to find out how the different principles of the previous chapter has been balanced against each other and if the current legislation allows a shift in this balance.

The previous chapter ended with concluding that the UNCLOS is likely to provide the biggest obstacles to increased coastal state control. Therefore, this investigation will start with reviewing what possibilities the UNCLOS leaves for coastal states to demand information or influence over a certain shipment.

As was noted in the introduction, the investigation is delimited to investigating coastal states rights in relation to four possible degrees of control; an unconditional ban, prior informed consent, prior information and no information. These degrees of control will all be examined in relation to how far from the coast line the shipment is scheduled; the territorial waters, the EEZ and the adjacent high seas. A conclusion will be reached on to what degree a coastal state can influence a shipment, and to what degree this right to influence is decreased as the distance to the *en route* states coast line increases.

3.2. UNCLOS revisited

Finding the applicable legislation to answer the above question begins with revisiting the UNCLOS. What legislation concerns the coastal states? What rights do they have, in general, to receive information about, to ban or to control vessels in their waters? Are there any exceptions for nuclear cargo? Can environmental concerns expand coastal states rights? The following section will analyse the articles of the UNCLOS to find what legislation that concerns coastal states and how the rights differ, depending on if a transport is destined through the territorial waters, the EEZ or through the adjacent high seas of a coastal state.

The Territorial Waters – non-innocent passage
A coastal states national sovereignty extends beyond its boarders a maximum of 12 nautical miles from its baseline.[104] The word sovereignty suggests that the coastal state therefore has the same control over the territorial waters as it has over national *terra firma*. However, as have been indicated above, the sovereignty is limited;[105] the principle of innocent passage supersedes that of national sovereignty.[106] Of interest in this case are the general rules of innocent passage, applicable to all vessels, and the specific rule concerning ships carrying

104 Art 2 and 3 UNCLOS
105 Art 2 pt 3 UNCLOS
106 Section 3 UNCLOS

nuclear materials.[107]

If a vessel can be defined as non-innocent; a coastal state is entitled to *"take the necessary steps*" to prevent its passage.[108] Thus, should a ship carrying spent nuclear fuel be defined as non-innocent are all of the above suggested requirements; an unconditional ban, prior informed consent or prior information in accordance with the UNCLOS.

First of all, can a ship carrying spent nuclear fuel can be considered innocent? According to Art 19 UNCLOS; a passage is innocent as long as it is not "*prejudicial to the peace, good order or security*" of a coastal state. To find out what constitutes such prejudice Art 19 UNCLOS proceeds with a list giving examples of such situations. Out of these, none are *a priori* matching the case of transport of spent nuclear fuel. Art 19.2 (h) UNCLOS refers to any *act* of *wilful* and serious pollution. Although, in the case of transporting spent nuclear fuel, there is an obvious risk for serious pollution, for this article to be applicable the damage must already have taken place. Furthermore, even if a ship in a situation of hardship causes pollution, it is still to be considered innocent, as long as the pollution was not wilful. Finally, Art 19.2 (l) refers to any other *activity*; in other words, there is a demand of positive action, the mere threat of an incident is not enough to declare a ship non-innocent.

Hence, the possibilities to declare a ship carrying spent nuclear fuel as non-innocent according to the list in Art 19.2 UNCLOS are close to non-existent. However, as noted above, the list is not to be considered exhaustive, and hence it is also possible to fall back on the initial definition of a non-innocent passage; that it is not "*prejudicial to the peace, good order or security*" of a coastal state. Clearly, this broad statement provides more room for manoeuvre, than the more specific wordings in Art 19.2.

However, it is not free for a coastal state to arbitrarily decide whether or not a certain manoeuvre is to be considered as non-innocent. According to the *Corfu Channel case*[109] the assessment of whether or not a passage shall be considered innocent is objective; the opinion of the coastal state alone can not render a certain passage innocent or non-innocent.[110] This is also supported by the fact that the enumeration was not originally in the 1958 convention,[111] but added after proposals from several countries, wishing to specify the term *innocence*, and circumvent possible coastal state arbitrariness in interpretation.[112]

As a conclusion, although the enumeration in Art 19.2 UNCLOS is not exhaustive, the fact that ships innocence shall be determined objectively indicates that the wording "*prejudicial to the peace, good order or security*" shall be interpreted in a strict sense. It is possible to argue that the risks connected with a transport of spent nuclear fuel are threatening the coastal state's security. However, there is also a special regulation concerning ships carrying nuclear materials, Art 23 UNCLOS. Although this article is not concerned with defining innocent and non-innocent passage, we find that it is undoubtedly possible for a vessel carrying nuclear cargo to sail innocently. Thus, for a ship to be determined as non-innocent, presumably it must at least deviate from the specific demands articulated in Art 23 UNCLOS; something that most shipments are unlikely to do. Therefore it is not likely that a transport of spent

107 Art 23 UNCLOS
108 Art 25.1 UNCLOS
109 Corfu Channel case, Judgment of April 9th, 1949, I.C. J. Reports 1949, p. 4, at p 30.
110 Cassese, International Law, Second Edition, Oxford University Press, Hampshire, 2005, p 85.
111 Convention on the Territorial Sea and the Contiguous Zone, 1958
112 Ghosh, S.,"The legal regime of innocent passage through the territorial sea", Law of the Sea, ed. Hugo Caminos, Ashgate/Dartmouth, 2001, p 58.

nuclear fuel shall be considered as non-innocent according to the UNCLOS. However, a coastal state also has a right to control the innocent passage to a certain extent; which will be addressed next.

The Territorial Waters – innocent passage
If the shipment of spent nuclear fuel is assessed to be innocent, as is most likely the case, the passage can still be regulated by the coastal state to some extent. This does obviously not include an unconditional ban of transports of spent nuclear fuel, but perhaps demanding prior informed consent or prior information can be justified?

According to Art 21 UNCLOS, a coastal state may legislate on a number of issues; of interest in this case is (a), (d) and (f) concerning safety of navigation, conservation of living resources and preservation of the environment, including pollution control. However, this opportunity to legislate is limited in a few respects. First of all, they may not concern the vessels design, construction, manning or equipment. This may possibly provide an obstacle, should a country wish to demand higher security standards than what is provided for in international legislation. However, as will be seen below, in respect of design, construction, manning and equipment; international regulations are extensive.

Secondly, any legislation adopted by the coastal state must not have the practical effect of denying or impairing the right of innocent passage or discriminate against a particular nationality.[113] Demanding a prior informed consent is hence not in accordance with this article, as it would, should consent not be given; impair the right of innocent passage. Demanding a prior notification, on the other hand, does not impair the right of innocent passage; as the coastal state in that case have no right to object to the transport, although they are entitled to receive knowledge about it. At the same time, the procedure of prior notification was suggested and rejected during drafting of the UNCLOS.[114] However, even if the prior notification did not explicitly make it into the UNCLOS, it is not excluded either. The fact that it was left outside is certainly not equal to banning such practice.

Moreover, apart from being able to demand prior information from vessels carrying nuclear fuel, the UNCLOS gives the coastal states right to prescribe sea lanes that the vessels are obliged to conform with.[115] In combination with a demand on prior information, this provides an instrument for coastal states to exclude heavy traffic routes or areas otherwise implying particular risks. However, as stated above; only to an extent that does not deny or impair the right of innocent passage.

Finally, ships carrying nuclear materials are obliged to carry documents and observe measures prescribed in international agreements.[116] What international agreements that are the target of this wording will be considered later.[117] The fact that they are obliged to carry documents implies that the coastal states are entitled to check them.[118] Enforcement is otherwise regulated in Art 27 and 220 UNCLOS and usually demands a high degree of suspicion of that the vessel has acted in violation of an international or a national rule. However, the wording in Art 86 indicates that there is an information duty to the coastal state, if not prior to departure, so at least when the ship is traversing the coastal states territorial waters.

113 Art 24 and Art 211.4 UNCLOS
114 Ghosh, S., p 60-61
115 Art 22 UNCLOS
116 Art 23 UNCLOS
117 See below, section “International Agreements and Competent International Organizations in the UNCLOS”.
118 Ghosh, S., p 61.

The Territorial waters – Conclusions
If the coastal state can prove that a vessel carrying spent nuclear fuel is non-innocent, it is possible to ban the ship from its waters, demand prior informed consent or request prior information. However, in most cases, the hazardous nature of the cargo as such does not make the shipment non-innocent. In that case, the coastal state may still demand prior information, advise the ship of certain sea lanes and review the documents that the vessel is obliged to carry. Furthermore, ships carrying nuclear materials are obliged to observe standards set forth in international agreements. This internalises several international agreements into the UNCLOS that also shall have to be taken into account. Such a reference to instruments outside of the UNCLOS is not unusual, although not uniformly formulated. UNCLOS references to external material is discussed below, in a separate section.[119]

The High Seas
The high seas are defined as the areas not being the EEZ, territorial waters or any other special zone discussed in the UNCLOS.[120] The high seas are *res communis omnium*, they belong to everyone; the freedom of navigation is unlimited. No state may claim sovereignty over the high seas.[121] The right to intercept a vessel flying a foreign flag on the high seas is limited to a few cases including slave trading, piracy and illegal broadcasting.[122] Otherwise, a vessels flag state is responsible for ensuring that sufficient safety and security standards are maintained. A coastal state hence has a very limited control over ships travelling the high seas. This does not mean that the high seas are unregulated, but that the right/duty to legislate falls entirely on the flag state; the coastal state may only influence such regulations indirectly through the relevant international organs. As a conclusion, a coastal state can not demand prior notification, prior informed consent or ban vessels travelling in their adjacent high seas.

The Exclusive Economic Zone
The EEZ is the area beyond and adjacent to the territorial sea; it extends up to 200 nautical miles[123] from the baselines from which the territorial sea was measured.[124] The EEZ is, similar to the high seas, subject to the freedom of navigation; Art 58 UNCLOS which defines the freedom of navigation in the EEZ also refers to the corresponding article concerning the high seas. However, the legal status of the EEZ is different from both the territorial waters and the high seas. It is neither a zone of national jurisdiction nor *res communis omnium*; rather, it is to be considered a zone *sui generis.*[125]

Therefore, the coastal states have some sovereign rights that are connected specifically with the EEZs. Of relevance to this thesis is mainly 56.1 (b) (iii), which provides that the coastal state has jurisdictional right concerning the preservation and protection of the marine environment. Furthermore, in 56.1 (a) it is stated that a coastal state has the sovereign right to conserve and manage natural resources; however, this is mainly concerned with how fishing and extraction of resources from the seabed should be administered, accordingly this thesis

119 See below, section "International Agreements and Competent International Organizations in the UNCLOS".
120 Art 86 UNCLOS
121 Art 89 UNCLOS
122 Art 110 UNCLOS
123 The figure 200 miles emanates from that Peru thought that this was the width of the Humboldt current; an area with particularly good fishing adjacent to Peru's coastline, wishing to keep these waters under Peruvian control. See Koh, T. B. T.,"The Exclusive Economic Zone", *Law of the Sea*, ed. Hugo Caminos, Ashgate/Dartmouth, 2001, p 163.
124 Art 55 and 57 UNCLOS
125 Koh, T. B. T.,"The Exclusive Economic Zone", p 185-186.

will focus on 56.1 (b) (iii). Also, note that when coastal states exercise their rights according to these articles; they are limited to act in accordance with the convention and taking into account the rights and duties of other states.[126]

When exercising their jurisdictional right concerning preservation and protection of the marine environment, coastal states are not free to take any precautions they like. The freedom of legislation that the coastal states enjoy is specified in Part XII of the UNCLOS.[127] To the extent that the UNCLOS does not provide for a clear division of rights concerning a specific issue, residual rights does not automatically belong to the coastal states. In these cases, the question must be analysed and solved equitable and weighing in all interests of the parties of the conflict, but also of the international community as a whole.[128] In other words, residual rights must be judged on a case-to-case basis; a consequence of the EEZs hybrid character as being neither under national jurisdiction nor completely devoid of national character.[129]

Exclusive Economic Zones and Marine Pollution according to Part XII UNCLOS
In order to find out to what extent a coastal state may demand prior information or consent, or issue a complete ban, it is necessary to first analyse the content of Part XII UNCLOS. To the extent the question is not covered by this section, it shall be considered a residual right, and be assessed according to the above described procedure.

Initially, there is a general obligation on all states to protect and preserve the marine environment; this naturally includes not only coastal states but also flag states.[130] Furthermore, they are obliged to take *"all measures* [...] *necessary"* to prevent pollution as long as it does not result in an "*unjustified interference*" with other states rights according to the convention.[131] However, this shall not be interpreted as that the coastal states always has an overarching duty to prevent pollution; sometimes this duty befalls on the flag states. Part XII UNCLOS is in fact mostly concerned with dividing the responsibility of environmental protection between coastal and flag states; sometimes, the flag states are obliged to attend a minimum standard, sometimes the coastal states are only allowed to set a standard to a certain maximum level.

Art 197 UNCLOS incorporates the cooperation principle, stating that countries are obliged to co-operate in *"formulating and elaborating international rules, standards and recommended practices and procedures consistent with this Convention"* in order to protect the marine environment. Both international and regional cooperation is encouraged, whilst as a consequence, unilateral manoeuvres seems to be ruled out. Thus, Art 197 UNCLOS does not promote the cooperation principle in a wider sense; demanding that states bilaterally cooperates on a case-to-case basis by for example providing each other with prior information. It is merely an encouragement to states to take joint action outside the UNCLOS, to improve the environmental legislation that the UNCLOS incorporates, for example, through Art 211 UNCLOS.

According to Art 211.5 UNCLOS, a coastal state may in its EEZ adopt regulations or laws "*conforming to and giving effect to generally accepted international rules and standards established through the competent international organization or general diplomatic*

126 Art 56.2 UNCLOS
127 Koh, T. B. T.,"The Exclusive Economic Zone", p 164.
128 Art 59 UNCLOS
129 Koh, T. B. T.,"The Exclusive Economic Zone", p 187.
130 Art 192 UNCLOS
131 Art 194 UNCLOS

conference." This is one of the built in flexibilities of the UNCLOS; the level of environmental protection is not directly defined in the text of the treaty. Instead the text contains a reference to *"generally accepted international rules and standards"* and *"competent international organizations or general diplomatic conference"*. These formulations are similar to the ones used in Art 23 UNCLOS, as cited above. To find out what legislation that a coastal state may adopt, a definition of the meaning of these phrasings is necessary. However, initially we may conclude that coastal states can not unilaterally impose any legislation in their EEZ that does not correspond to rules and standards accepted by the appropriate international forum. It is important to note that in the case of coastal state influence on vessels in their EEZ, the international agreements constitute a maximum level of protection. Flag states on the other hand must implement international legislation as a minimum requirement. They are free to conjure harsher legislation on vessels flying their flag, should they wish to do so.

International Agreements and Competent International Organizations in the UNCLOS
As seen in the above review of coastal states possibilities to influence on a transport of spent nuclear fuel, there are continuously references to international agreements, standards or rules as well as to competent international authorities and such.[132] However, this terminology is not consequent through the treaty and it is not clear from the text what agreements and what organizations that it is actually referring to. This question is of great importance; as we have seen, possibilities to influence the freedom of navigation or the innocent passage are very small, judging only from what can be *a priori* deducted from the text of the UNCLOS.

Unfortunately, there is no easy solution to this question. It is acknowledged to be difficult by some authors[133], while others choose to promote one solution without reference to the intrinsic problem of definition.[134] In the following, we shall first of all try to solve the issue of the "competent international authority" as used in Art 211.5 UNCLOS and secondly, we shall try to find the international agreements that are addressed in Art 23 UNCLOS.

Article 211.5 UNCLOS
*W*hen it comes to Art 211.5 UNCLOS, there are three separate issues. First of all, who is the competent authority? Secondly, is there a difference between a "rule" and a "standard"? And finally, what level of acceptance is "generally accepted" in practice?

The competent international organization in 211.5 is according to the *Law of the Sea Bulletin* referring to the IMO.[135] However, in the same article we find that the list provided is only advisory; it is possible that other organizations will be considered competent in the future, and it is also possible that organizations not mentioned in the tables are to be considered competent on an advisory level or through a mandate from an organization named in the table.[136] As a conclusion so far, this means that the UNCLOS is truly flexible. It is designed to bend with environmental trends, allowing current issues be incorporated as parts of the UNCLOS itself, as long as they have reached a certain state of acceptance.

132 Examples of such wordings can be found in Art 23 and Art 211 UNCLOS to mention a few.
133 See for example, Boyle, A. E., "Marine Pollution Under the Law of the Sea Convention", *Law of the Sea*, ed. Hugo Caminos, Ashgate/Dartmouth, 2001, p 382-383 and Louka, E., p 147.
134 See for example Dixon, D. B., p 27, Sage, B., p 368.
135 "Competent and Relevant International Organizations under the United Nations Convention of the Law of the Sea", *Law of the Sea Bulletin,* no 31, p 79-95, 1996, p 87.
136 "Competent and Relevant International Organizations under the United Nations Convention of the Law of the Sea, p 79.

Boyle suggests that in weighing between a strict or a wide interpretation of what international rules or standards that should be taken into account as "generally accepted", one should keep in mind the purpose of the UNCLOS; in many cases to fill an obligation to regulate with content, but in the case of coastal state legislation; to limit their possibilities to unduly hamper the right of navigation of other states.[137] Thus, it is motivated with a slightly more cautious or narrow interpretation in the cases where the UNCLOS provides a maximum standard; a wider interpretation should be employed when the convention suggests a minimum level.

In defining what is "generally accepted", the interpretation ranges from that it is a rule that enjoys ratification and implementation in many national laws; or that a rule is considered to be customary law; or that it is enough that the rule has been negotiated in an international arena and is ratified by enough countries to make it enter into force.[138] There are problems contained in each of these approaches; demanding near-global ratification or a status as customary law would render the rule tooth-less in practice, as it would only point towards such rules that are so commonly accepted that they need not be referred to. On the other hand, employing the latter view could interfere with the national sovereignty of countries that deliberately have chosen not to ratify a certain convention, and that then would be forced to conform to this view contrary to its conviction. On the other hand, as these rules would be implemented only in the coastal waters of foreign countries, the sovereignty on a countries national territory will not be affected. They are free to employ less strict environmental rules in their own waters since, as shown above; the coastal state legislation in the EEZs are stating a maximum and not a minimum level. Thus, it seems quite equitable to me that a coastal state may legislate using the interpretation that "generally accepted" shall be interpreted as "ratified by enough countries to enter into force".

Finally there is the distinction between "standards" and "rules". This division could indicate that whereas "rules" are referring to binding legislation, "standards" could refer to mere recommendations not intended to have binding force. *Boyle* argues that "standards" simply indicates a different kind of binding obligation, as he defends the states right to *"make collective recommendation without their becoming instantly and indirectly a form of binding obligation."*[139] However, in my opinion, *Boyle* neglects that recommendations by no means instantly turns into international law, should they be covered by the term "standards" in Art 211.5 UNCLOS. For a "standard" to become a legal rule according to this article, it must be both "generally accepted" and be created by the "relevant international organisation". Furthermore, a coastal state must implement it into its own legislation; otherwise it has no binding effect.

The purpose of issuing recommendations, for example in the IMO, is that companies and countries shall follow these. The fact that a recommendation is not formulated as hard law may have several reasons; perhaps it is considered to be more effective hoping that a certain industry with strong groups of interest will regulate themselves rather than through the use of force. Perhaps there are one or a few parties that continuously object to a binding legislation. However, employing the same line of argument as above, all countries are free to keep the lenient legislation outside their own coast lines, should they wish to do so. It does not actually influence their state sovereignty, should other coastal states choose to implement a certain "standard" as a binding obligation in its EEZ. As noted before, the EEZ is different from the high seas in that it is not *res communis omnium.*

137 Boyle, A. E., p 382.
138 Boyle, A. E., p 382.
139 Boyle, A. E., p 383.

Concluding the discussion on Art 211.5 UNCLOS, it has been shown that the IMO is the main competent organisation; however this is not to be considered an absolute truth, but rather a current state, subject to change. Secondly, it has been concluded that "generally accepted" should be taken to mean that it is negotiated on the international level and that it has entered into force. Finally, I argue that rules and standards are not two names of the same thing, but rather that also non-binding documents can be considered under Art 211.5; as long as they also fulfil the other criteria stated in the article.

Article 23 UNCLOS

Initially when discussing Art 23 UNCLOS, it shall be noted that it does not contain a reference to an international organ; it simply states that the vessel shall observe special precautionary measures, as established through "international agreements". Does this mean that an international agreement concluded through any authority on this subject is relevant according to Art 23 UNCLOS? This is not impossible, however, according to the *Law of the Sea Bulletin*, a certain international organisation may be considered as competent, although not being specifically referred to; when formulations such as "international rules and standards" or similar, are being used.[140] However, what international organ is competent in this area? As the article is specifically concerned with vessels carrying nuclear cargo, it is likely that the IAEA is the main competent organ.[141] However, it seems possible that both the IMO and regional organs, such as the EURATOM-agreement may be relevant, as long as they are of reasonably international or regional character. What particular regulations or codes that may be significant will be discussed in the section that concerns nuclear transport regulation outside of the UNCLOS.

Special Remarks concerning a ban on Nuclear Transports and Art 195 UNCLOS

Article 195 UNCLOS provide that all states have a duty not to transfer damage or hazards from one area to another, directly or indirectly. Considering the case if a coastal state should ban the transport of spent nuclear fuel through their territorial waters or EEZ, justly or unjustly. If such a ban is respected by the shipping country, the result is most likely that another route is chosen. This other route may possibly be even more dangerous than the original route, as it may demand that the shipment traverses a more dangerous strait, more heavily trafficked waters or similar. In other words, the denial of passage may in itself be against the UNCLOS, as it leads to that the damage, rather than being eliminated, is transferred to another area. This is an argument also following from that the UNCLOS favours multilateralism; a one-sided ban is no good from the perspective of the UNCLOS, rather, the solution would be to find a sensible international solution, making sure that safety is ensured throughout the vessels journey. Or, should a ban be justified; viewed from the UNCLOS perspective, such a ban should follow from an international or a regional agreement, rather than from national legislation. This reasoning makes sense, in the way that it prohibits that potential hazards are simply pushed around, until a route of non-protesters is found. The reasons why certain coastal states would not protest, or not be heard protesting does not always ground in an indifference to the practice as such, but rather that the political reality makes it necessary for some states to ignore certain risks in hope of gaining benefits in other areas.

140 "Competent and Relevant International Organizations under the United Nations Convention of the Law of the Sea", *Law of the Sea Bulletin,* no 31, p 79-95, 1996, p 79.

141 IAEA is also mentioned several times in the list provided in "Competent and Relevant International Organizations under the United Nations Convention of the Law of the Sea", *Law of the Sea Bulletin,* no 31, p 79-95, 1996.

Special remarks concerning the demand of prior assessment in Art 206 UNCLOS
One argument favouring prior information can be found in Art 206 UNCLOS. This article demands that a state assess the potential effects of an activity that "may cause substantial pollution" to the marine environment and is within their jurisdiction or control. The results shall be published or deposited at the relevant international organisation, "*available to all States*". The transport of spent nuclear fuel is a hazardous activity, which may result in substantial damage. Hence this article is applicable to such a transport. The assessment should be made by a vessels flag state; as the flag state has both jurisdiction and control over the vessel. To some extent a coastal state may be obliged to investigate a foreign transport through its territorial waters, but as it is likely to not even be aware of such a transport, this would be impracticable. If it has been informed about a transport, they are probably obliged to perform some kind of evaluation too. However, it is not clear to what extent such an investigation should be done; according to the article they shall do so *"as far as practicable"*. The applicability of Art 206 UNCLOS was also the subject of the *MOX-plant case*[142], which will be discussed in further detail below.[143]

Conclusions
As a conclusion, we see that *a priori*, coastal states have little right to influence shipments, due to the principles of innocent passage and freedom of navigation. There is no possibility for a coastal state to demand information, prior informed consent or to ban a shipment from sailing through their adjacent high seas. When it comes to the territorial waters, a coastal state can take any of these measures to the extent that the shipment can be considered non-innocent. Still, it is not likely that a shipment is to be considered anything but innocent; hence, a coastal state has no right to ban the shipment or demand prior informed consent. On the other hand, it is likely that demanding prior information is in accordance with the UNCLOS. Finally, when it comes to the EEZ, a coastal state has no right to prevent freedom of navigation, except for what is allowed in part XII of the UNCLOS.

However, there are references to legislation outside of the UNCLOS both concerning navigation in the territorial waters and the EEZ; they function as a built in flexibility of the system. The fact that the UNCLOS is not being explicitly clear about what legislation that is refers to is making the issue more complex, though, it shall be remembered that this construction is deliberately done as to prevent the UNCLOS from becoming outdated too fast. The main principles that needs to be remembered is that there must be a reasonable balance between the rights and duties of coastal states and flag states; but also that too narrow interpretations will render the UNCLOS devoid of any meaning.

The next step is hence to investigate what legislation that the UNCLOS is targeting and if any guidance can be found in these adjoining treaties when it comes to the right for coastal states to demand information about and influence on transports of spent nuclear fuel.

3.3. Regulations concerning the transport of Spent Nuclear Fuel beyond the UNCLOS

Next is hence the question of what legislation that exists concerning the transport of spent nuclear fuel, outside of the UNCLOS. It shall be remembered that this legislation is possibly incorporated through either Art 23 or Art 211.5 UNCLOS. As was already indicated above, the main regulatory bodies when it comes to the maritime transport of nuclear materials are

142 The MOX-plant case (Ireland v. U.K.) 41 ILM (2002)
143 Sands, P., p 806.

the IMO and the IAEA; but also the EURATOM and the OECD's NEA may be relevant. In the following we shall consider what legislation that exists especially when it comes to notification systems, safety precautions, security and possible coastal state control.

Notification systems

After the disaster in Chernobyl a system of early notifications in case of an imminent or actual accident involving radioactive materials was constructed.[144] There are several systems; the main one being the 1986 Notification Convention.[145] Furthermore, the UNCLOS also addresses the issue of notification in Art 211.7. However, all of these notification systems has in common that they demand notification only when the accident is real or imminent.[146] However, there is a significant difference between a system of notification concerning an actual or imminent damage and a system of prior information or prior informed consent. A system of prior information allows for a coastal state to take relevant measures in anticipation of the transport; cooperation concerning the choice of route, define specific sea lanes for the transport, create an own contingency plan, re-route other maritime traffic as to minimise the risk of damages, to give a few examples. Notification when the accident is imminent or real only provides for emergency measures. A country unaware of the risk until it is imminent does not have the same opportunities to plan and prepare as a country notified at least before commencing the transport. Thus, the systems of early notification, although important in their own right, do not provide an opportunity for coastal states to influence a transport of spent nuclear fuel.

Transport related legislation

The legislation relating to the transport of nuclear materials can be divided into two groups, binding and non-binding legislation. The binding legislation constitutes mainly of the 1997 Joint Convention[147], the 1980 Physical Protection Convention[148], the IMDG code[149] and the INF code[150]. The non-binding agreements that will be discussed here are the IMO code of safety[151] and the IAEA's regulations for the safe transport of nuclear materials[152].

The Joint Convention deals with safety issues concerning spent fuel and radioactive waste; of interest in this case is mainly Art 27, dealing with transboundary transports of such materials. It is a system of prior notification and consent in relation to the state of destination. When it comes to transit states, transports shall be conducted in accordance with international regulations for that particular mode of transport.[153] Transit states are defined as any state *"through whose territory a transboundary movement is planned or takes place";* this possibly includes the territorial waters, over which the coastal state has sovereignty; but probably not

144 Sands, P., Principles of International Environmental Law, Second Edition, Cambridge University Press, 2003, p 647 and 844.

145 The 1986 IAEA Convention on Early Notification of a Nuclear Accident; for more examples see for example Sands, P., p647-648 and p 844-845.

146 According to Boyle, there have been suggestions to construct a system of earlier notification, after the *Amoco Cadiz* incident in France. However, they are not included in the current version of the UNCLOS. Boyle, A. E., p 395.

147 The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 1997.

148 The 1980 Convention on the Physical Protection of Nuclear Material

149 International Maritime Dangerous Goods Code.

150 Code for the Safe Carriage of Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes in Flasks On Board Ships, IMO Res. A.748 (18), 1993.

151 IMO Code of Safety for Nuclear Merchant Ships, IMO Res. A. 491 (XII) Part A, 1981.

152 Regulations for the Safe Transport of Nuclear Material, IAEA 2005.

153 Art 27.1 (ii) Joint Convention

the EEZ. However, it can be concluded that as the mode of transportation is by ship, the relevant international legislation is the UNCLOS, unless there is a *lex specialis* for maritime transport of spent nuclear fuel.

The INF code and the IMDG code are mandatory as they are implemented through chapter VII Part D SOLAS[154]; the IMO code of safety is referred to in Chapter VIII on Nuclear ships. The IMDG code is concerned with setting a safety standard for radiation levels and risks that humans, property and the environment reasonably can be exposed to. The INF code provides a number of technical aspects on how to physically transport and store nuclear materials; including design recommendations for containers and for the carrying vessel.

The IAEA regulations[155] are also concerned with technical specifications; to a large extent they are similar to the demands put forth in the INF and the IMDG codes. In case of transports not complying with the IAEA regulations, they demand multilateral approval. However as can be seen in the definitions[156], this refers to shipments through or into another country. This possibly includes the territorial waters, however, this only concerns transports that do not conform to the regulations and it shall furthermore be noted that the IAEA regulations are only recommendations. Hence, to base a claim for prior informed consent on the IAEA code is not likely to have but advisory effect. As a conclusion, although these codes provide detailed technical regulations, they do not affect coastal states right to influence.

The Physical Protection Convention is concerned with securing that nuclear materials does not fall in the wrong hands while being transported internationally.[157] Art 4 (3) Physical Protection Convention provides that a transit country shall not allow thoroughfare unless the transport fulfils the safety precautions spelled out in Annex 1 Physical Protection Convention. However, Art 4 (3) Physical Protection Convention also specifies transit to be *"by land or internal waterways or through its airports or seaports"*. Thus although there is a limited duty to inform and give prior consent in this convention, these rights are not applicable to coastal states.

Conclusions

Nuclear law is an area which is internationally much and thoroughly regulated, especially when it comes to safeguards and technical safety issues. However, other areas concerning the transport of spent nuclear fuel are left unregulated. As have been shown, there are no specific rules or treaties that concern a coastal states right to control an *en route* shipment. Some regulations refer to transit states, but as have been discussed previously, coastal states are not always included in this group. Using a wide interpretation, a vessel traversing through coastal states territorial waters may be considered as a transit shipment through that country; however even if this is a correct analysis, it does not help the coastal state. As we have seen, the only regulation demanding multilateral consent, thus including transit states, is the IAEA regulations, which are not mandatory. Secondly, the IAEA regulations only demand multilateral consent in the case of special transports, not conforming to the regulations prescribed in the document. The lack of special rules concerning coastal states right to influence means that the general rules of maritime transport shall be applied; in other words, the UNCLOS.

154 International Convention for the Safety of Life at Sea (SOLAS), 1974
155 Regulations for the Safe Transport of Nuclear Material, IAEA 2005.
156 Regulations for the Safe Transport of Nuclear Material, IAEA 2005, Section II Art 204.
157 Preamble and Art 2 Physical Protection Convention.

Thus, we find that although nuclear transports have many rules concerning how to perform a safe transport, there is no rule allowing coastal states to investigate themselves if the international rules are followed. As a consequence of that the existing regulation is focussed on narrow rules of a technical character, there is an abundance of advice on how to perform a transport, but no third party insight in the procedures. Considering the principles discussed in the previous chapter, this is a lack of transparency. The lack of information to coastal states mean that although that they are considered to be sovereign in their territorial waters, they have little opportunity to take precautions or influence on transports that take place in their vicinity. At the same time, rumours on certain planned transports usually leaks; resulting in an increased concern due to the insecurity that lies in knowing that the country is exposed to a risk, without being able to confront the facts and review what precautions that have been taken in advance by the shipper. This leads us to the fact that many countries in fact have protested about nuclear transports in their waters; without knowing the exact details of future transports, this has resulted in legislation perhaps more far-reaching than had been the case, had their rights been more clearly identified in international legislation. These manoeuvres will be considered next.

3.4. Case Law

It is interesting to note that although, as shown by the above legislative review, the chances to ban a certain transport, to demand prior information or prior informed consent are small; this has repeatedly been done by several countries during recent years. They have based their dissent on the Basel Convention or on the Precautionary Principle. There are cases of legislative manoeuvres, reservations in their ratification of the UNCLOS and in one case Chile threatened with resort to military action; to escort a vessel carrying spent nuclear fuel out from its EEZ. Recently Ireland questioned Great Britain's practice at Sellafield in the *MOX-plant case*[158]*;* the charges were based on Art 206 UNCLOS. In this section the reasoning behind these different manoeuvres will be presented and analysed. To what degree is this reasoning in line with international law?

Reservations according to Art 310 UNCLOS

To gain some insight in different ways to interpret the UNCLOS concerning transport of spent nuclear fuel, it is interesting to review the reservations that states have made when ratifying the UNCLOS.[159] Argentine, Bangladesh, Egypt, Malaysia, Malta, Oman, Saudi Arabia and Yemen have all been in favour of coastal state control over such vessels whereas Great Britain and the Netherlands both claim that any demands for prior notification or prior consent/permission are not in line with the UNCLOS and that they will not accept any reservation with that content.

Among the other countries there are a few different lines of argumentation. The weakest statement comes from Argentina; they state that they consider it important that the international community produces more detailed rules in this respect. Malta and Bangladesh simply states that notification and authorization is needed before any such transport enter their territorial waters.

Saudi Arabia, Malaysia and Egypt take a more diplomatic stance, concluding that they will demand prior authorization by such vessels until the global community has created rules on this subject and Saudi Arabia/Malaysia/Egypt has become a party to such a convention.

158 The MOX-plant case (Ireland v. U.K.) 41 ILM (2002)

159 See Appendix I for a list citing all reservations concerning nuclear materials.

Hence, these countries argue that as the international agreements referred to in Art 23 UNCLOS have not yet been created, they have a right to stipulate their demands in the meantime. However, as a counter-argument to this; there is an abundance of safety regulations concerning transboundary nuclear transports, although none of them authorizes the coastal state with a right to demand notification or authorization.

Oman formulates the innocent passage of nuclear vessels as a favour that will be guaranteed, subject to a prior permission. However, this is otherwise similar to the statements made by Bangladesh and Malta; stating that prior information and consent is necessary, without further explanation.

Finally, Yemen has chosen a different line of argumentation. They argue that as prior agreement is necessary according to the general international law of national sovereignty; thus they do not consider themselves acting in conflict with the UNCLOS at all, when demanding prior consent. For a further discussion of this, see the environmental section above, concerning the sovereignty principle.

The MOX-plant case[160]
In the MOX-plant case, Ireland expressed their concerns over that Great Britain allowed the expansion of Sellafield with a MOX-plant. Ireland apply for provisional measures, to prevent Great Britain from commencing the plant before the final award is given. They claim that both the transports to and from the Sellafield plant as well as the plant itself pose a great risk.

The Irish side claim that the British have failed to attend to the principles of cooperation as they are expressed in Art 123 and 197 UNCLOS; as well as they recall that it also exists in international customary law.[161] Secondly, they claim that Great Britain have failed to undertake a prior environmental assessment according to Art 206 UNCLOS.[162] They also claim that it is motivated to apply the precautionary principle when assessing the UNCLOS based on that Art 293 UNCLOS include "other rules of international law" as applicable to dispute resolution and that the precautionary principle is now "recognised as a rule of customary international law"[163]

The tribunal finds that *"the duty to cooperate* [is] *a fundamental principle in the regime of the prevention of pollution of the marine environment under Part XII of the Convention and general international law."*[164] This is expressed in the award as a duty for the two countries to cooperate and to enter into consultations concerning exchange of information, risk monitoring and devising appropriate measures to prevent pollution.[165] Hence it seems that at least between

160 Note that another important question when it comes to the MOX-plant case is that of concurrent jurisdiction, in this case between the ITLOS and the ECJ. The ECJ later concluded that it had exclusive jurisdiction over the dispute. This issue is intriguing but must be left out, due to the limited scope of this thesis. See "Concurrent Jurisdiction: European and International – Concurrence of Jurisdiction between the ECJ and other International Courts and Tribunals", European Environmental Law Review, 213-225, 2005, Lavranos, N., "MOX Plant and Exclusive ECJ Jurisdiction – The MOX Plant judgement of the ECJ: How exclusive is the jurisdiction of the ECJ?", European Environmental Law Review, 213-225, 2005.

161 Request for Provisional Measures and Statement of Case of Ireland, the MOX Plant Case (Ireland v. United Kingdom), p 29. Accessible on http://www.itlos.org/cgi-bin/cases/case_detail.pl?id=10&lang=en#order

162 Request for Provisional Measures and Statement of Case of Ireland, p 27.

163 Request for Provisional Measures and Statement of Case of Ireland, p 43.

164 Joint declaration of Judges Caminos, Yamamoto, Park, Akl, Marsit, Eiriksson and Jesus, the MOX Plant Case (Ireland v. United Kingdom). Accessible on http://www.itlos.org/cgi-bin/cases/case_detail.pl?id=10&lang=en#order

165 The MOX-plant case (Ireland v. U.K.) 41 ILM (2002)

neighbouring states, there is a far reaching duty to cooperate and consult when it comes to this type of transports. This is an opinion that is seemingly expressed in all the separate opinions of the case, for example by Judge Wolfrum in the following paragraph;

> I fully endorse, however, paragraphs 82 to 84 of the Order, considering that the obligation to cooperate is the overriding principle of international environmental law, in particular when the interests of neighbouring States are at stake. The duty to cooperate denotes an important shift in the general orientation of the international legal order. It balances the principle of sovereignty of States and thus ensures that community interests are taken into account vis-à-vis individualistic State interests. It is a matter of prudence and caution as well as in keeping with the overriding nature of the obligation to co-operate that the parties should engage therein as prescribed in paragraph 89 of the Order.[166]

However, the MOX-plant case was special since it concerned two neighbouring countries with a semi-enclosed sea in-between them and that it did not only concern the transport but also the commencement of a permanent site. Thus it is not self-evident that the ITLOS would come to the same conclusion were there no permanent construction, but only a ship passing through the territorial waters or the EEZ of a distant country *en route* to its destination.

When it comes to the applicability of the precautionary principle and Art 206 of the UNCLOS the award does not give much guidance. Judge *ad hoc* Székely (nominated by Ireland) criticizes the outcome in his separate award; he considers particularly the inadequate quality of the British environmental impact statement as a breach of Art 206 and something that require a provisional measure. Judge *ad hoc* Székely also implies that the tribunal's award was a diplomatic product; a compromise, rather than the correct legal solution. Furthermore, he is of the opinion that due to the lack of evidence supporting the United Kingdoms allegations that the practice was harmless; the tribunal should have employed the precautionary principle; or in other words, a reversed burden of proof resulting in that Ireland should be granted the provisional measures.[167]

Presumably, these would have been important issues that the actual arbitral tribunal would have needed to assess.[168] However, it has been concluded that the ECJ have exclusive jurisdiction over the issue; hence the case is not likely to be finally tried by the ITLOS.[169]

Thus, concluding this discussion on the MOX-plant case we find that the applicability of the precautionary principle or the Art 206 UNCLOS is not confirmed in the MOX-plant case. But perhaps more importantly, it is neither ruled out. In the next section, other examples of when the precautionary principle has been applied will be investigated. Finally, the MOX-plant case have indicated that the cooperation principle perhaps may be applied to demand prior consultation including information on a transport of spent nuclear fuel. At the same time, the MOX-plant case is different from the case of *en route* coastal states, something that makes it difficult to generalize this conclusion to the latter situation.

The Precautionary Principle

The precautionary principle have been used as an argument in deterring shipments of spent nuclear fuel from certain countries EEZs more or less explicit in a number of cases; particularly concerning the shipments of radioactive materials between Japan and France or

166 Separate opinion of Judge Wolfrum, the MOX Plant Case (Ireland v. United Kingdom) Accessible on http://www.itlos.org/cgi-bin/cases/case_detail.pl?id=10&lang=en#order

167 Separate opinion of Judge *ad hoc* Székely, the MOX Plant Case (Ireland v. United Kingdom) Accessible on http://www.itlos.org/cgi-bin/cases/case_detail.pl?id=10&lang=en#order

168 Sands, P., p 807

169 Lavranos, N., both articles.

the United Kingdom.[170] In the following, I have chosen to highlight Chile, as an example. However, also New Zealand has explicitly applied the precautionary principle; it is also often implicit in the statements of protesting countries.

The 1994/95 shipment with the *Pacific Pintail* was scheduled to sail the Cape Horn route. The shipment was banned by a number of countries; including Chile. At the time, the Chilean Nuclear Law did not contain any regulations regarding shipments of nuclear materials.[171] However, the Chilean foreign minister stated that the country had *"enough legal arguments to protect human health, ecology and the environment in the area to demand that this boat not pass through Chilean territorial waters."*[172] Following this decree, when the Pacific Pintail still enters the Chilean EEZ it was interrupted by Chilean navy, demanding that it immediately steer away from Chilean waters or they would be *"exposed to the use of weapons"*.[173] The motivation was that *"the carrying of your radioactive material is a violation of the precaution principle"*[174]

This shall be compared with the current wording of the Chilean Nuclear Law, which since 2002 demands advance consultation and consent "*for the entrance or transit through the national territory, exclusive economic zone*, [and the] *territorial sea"*.[175] To receive the commission's approval "*the applicant shall provide the dates of when the transport commences, the routes and areas traveled, the characteristics of the load and the contingency and safety measures."*[176] This description is remarkably similar to the *Van Dyke* proposal of what the precautionary principle contains; prior information and consultation in combination with an environmental impact assessment.

Perhaps the Chilean case is particularly strong as the waters around Cape Horn are known to be difficult; thus it becomes increasingly important for Chile to know that the environmental assessment done by the shipping country takes into account the particular hazards of this area. Furthermore, who would be better suited to inform about local conditions, but the *en route* nation in question?

Applying the precautionary principle; the conclusion is that as a shipment of radioactive materials poses a significant risk to the environment, the reversed burden of proof demands that the shipper demonstrates to the *en route* state that they have adopted an adequate level of safety and security measures, reducing the risk to an acceptable level. Thus, an application of the precautionary principle to the shipment of radioactive material would contain three important steps; the shipping party must undertake an environmental impact assessment, the shipping party must inform all parties that may be affected so that they can evaluate the quality of the assessment and finally, all the *en route* states must give their consent, provided that the information is satisfactory.

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170 For more details concerning these shipments and the opinions of protesting countries and NGOs, see http://www.nci.org/seatrans.htm and Van Dyke, J. M., "Applying the precautionary principle [...]".

171 Ley de Seguridad Nuclear, LEY Núm. 18.302, 1984 (Chile's Law for Nuclear Safety)

172 Citation taken from footnote 93, Van Dyke, J. M., "Applying the precautionary principle [...]"

173 Citation taken from radio transcript, March 20 1995, see footnote 22 in Dixon, D. B., p 6.

174 Citation taken from radio transcript, March 20 1995, see footnote 3, Van Dyke, J. M., "Applying the precautionary principle [...]".

175 Chile's Law for Nuclear Safety & Ley Núm. 19.825, 2002 modifica la ley nº 18.302, sobre Seguridad Nuclear (amendment to Chiles Law for Nuclear Safety). See appendix II for an excerpt of the relevant article and a translation into English.

176 Chile's Law for Nuclear Safety & amendment to Chiles Law for Nuclear Safety. See appendix II for an excerpt of the relevant article and a translation into English.

EU and the Precautionary Principle – Are there special conditions in the European Union?
Transportation of nuclear materials within the EU is subject to legislation specific for the region. As previously noted, the precautionary principle is to be considered in all of the community's activities, according to Art 174.2 EC Treaty read together with Art 6 EC Treaty.[177] This may have implications on how for example, how to interpret the UNCLOS, if a shipment is destined or originated in an EC country. That transports of spent nuclear fuel is an area that falls under the EC's competence has been decided by the ECJ in their decision on the MOX-plant case.[178] Hence, this section will give a short review of the EC legislation on the transport of nuclear fuel, concerning what rights a coastal state has to influence a certain shipment of spent nuclear fuel. The purpose of this section is to find if the EC regulation is different from the international legislation and if the mandatory character of the precautionary principle in the EU makes a difference.

The Commissions mandate when it comes to the transport of nuclear materials is based on a joint reading of Title V EC Treaty and Chapter III of the EURATOM Treaty.[179] Hence, the Commission has issued a number of directives on the subject. Since 1992 the transport of radioactive waste has been regulated in 92/3/Euratom; this document separates between spent nuclear fuel for reprocessing and spent nuclear fuel to be finally deposited of.[180] The directive hence covers radioactive wastes but not products. However, there is no other difference between the two types of spent nuclear fuel than its destined use; a political decision. Thus, 2006/117/Euratom was adopted to replace the old directive; the latter enters into force the latest 25 December 2008.[181] The distinction between nuclear waste as a product and as waste with no foreseeable usage area is kept; but this time both types are covered by the directive. As the new directive is to be implemented by the member states as soon as possible, I have chosen to refrain from discussing the old, but for another year, still valid directive 92/3/Euratom.

Art 1.2 (a) 2006/117/Euratom provides that the directive is applicable to transports of radioactive waste and spent fuel if the country of origin, transit or destination is an EC member state. In the definitions we find that a transit state is defined as a state through which territory a shipment is transported; this probably includes the territorial water, but does it include the EEZ? It is interesting to compare this definition with the one in the Basel Convention[182] where the territory includes all areas under national jurisdiction; defined as the areas where the country has a regulatory or administrative responsibility according to international law; thus including the EEZ.

The 2006/117/Euratom provides that for transports within the community transit states shall be notified and respond with a request for information, a consent or a denial. For transports destined to the community from a third country the same procedure applies. For transits through the EC an application must be sent to the first country of transit and must be confirmed by all EC countries of transit before the transport is commenced. In addition to this, a report of that the cargo has arrived at its destination must be delivered. Similar rules apply

177 Art 174 EC Treaty is an environmental protection requirement, and must thus be integrated in the definition and implementation of the community policies and activities, according to Art 6 EC Treaty.
178 Lavranos, N., both articles.
179 Treaty establishing the European Atomic Energy Community.
180 Council Directive 92/3/Euratom of 3 February 1992 on the supervision and control of shipments of radioactive waste between Member States and into and out of the Community, ineffective from 25 Dec 2008.
181 Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel. Enters into force the latest 25 Dec 2008, Art 22.
182 See further discussion on this in the next section on the Basel Convention.

to shipment destined from the EC to a third country. At the same time, a refusal must not be discriminatory; demands can not be significantly different than other member states, therefore a ban would not be in coherence with the EC legislation. However, this still means that the transit country has a right to receive information about a shipment and evaluate whether or not it is on par with international standards.[183]

Thus, we find that the EC regulation concerning the transport of spent nuclear fuel is strict; transit states are entitled to prior information and may reject an unsatisfactory application. Furthermore, these rules apply to all shipments entering EC territory, whether or not it is destined or originating from there. However, it is not entirely clear what a transit state is according to 2006/117/Euratom. If this include the EEZ, the EC regulation have followed in the steps of for example Chile, in concluding that the UNCLOS does not preclude a prior notification and consent procedure when it comes to nuclear materials. Such an interpretation of the UNCLOS can be motivated, as seen above, with arguing that the latter shall be interpreted in the light of the precautionary principle. As the precautionary principle is mandatory in the EC the restrictions to the freedom of navigation that are imposed by the 2006/117/Euratom can be motivated on a community level. However, as noted above, it is not certain that such a defence could work on an international level, as the status of the precautionary principle still is not certain.[184]

The Basel Convention[185]

One argument in favour for a duty of advance consultation that is sometimes brought forward is that demands on notification or prior informed consent are common for other hazardous wastes; that nuclear wastes are excepted is a produce of military history that should no longer be sanctioned.[186] In order to evaluate this argument, a closer examination on the general regulation controlling maritime transport of hazardous wastes must be done; the Basel Convention being the main international instrument in this area. Before assessing what rights that exist for coastal states under the Basel Convention, an Argentine court case will demonstrate that it is possible to argue that the convention should apply also to nuclear wastes. By doing this, Argentina, rather than claiming that the Basel conventions non-applicability is a *non sequitur,* claim that the discrepancy between transboundary nuclear transport regulations and the Basel Convention is proving the non-existence of *lex specialis* for such transports and that thus the Basel Convention is applicable.

The Argentine declaration in their ratification of the UNCLOS[187] was quite vague. However it is clear that they find the existing regulation on the transport of nuclear fuel to be insufficient. This opinion was followed up in 2004 with a court case prohibiting the decommissioned *San Onofre Nuclear Reactor*[188] to be transported through its EEZ, citing the Basel Convention and

183 R-07-11, Cramér, P., Stendahl, S., Erhag, T., "Nationellt ansvar för använt kärnbränsle i en utvidgad Europeisk Union", SKB 2007, p 88-89.

184 It would be interesting to examine further the question if the EC legislation on radioactive materials perhaps even is a hindrance to world trade, according to the GATT/WTO.

185 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

186 Louka, E., p 435.

187 See except in Appendix I

188 The issue concerned the transport of the decommissioned pieces of a south Californian nuclear reactor to a final deposit site on the American east coast. The sea route, passing the Cape Horn was preferred due to concern over the U.S. liability regulations. In the end, the transport was cancelled. See Currie, D. E. J., and Van Dyke, J. M., "Recent Developments in the International Law Governing Shipments of Nuclear Materials and their Implications for SIDS", Review of European Communities & International Environmental Law, 14 (2), pp 117-124, 2005, p 118-119.

the Argentine Constitution as motivating this decision.[189]

However, Art 1, Section 3 of the Basel Convention explicitly excludes radioactive wastes from its scope, to the extent they are subject to other international control systems or instruments. As we have seen above, spent nuclear fuel are subject to a multitude of safety and security regulations; although none of them relates to a coastal states right to prohibit a transport from its EEZ. Presumably, this led Judge Pfleger in the *San Onofre-case* to conclude that the Basel Convention was applicable to the transport of the decommissioned plant as there were no specific regulations providing the same protection as the Basel Convention.

Whether or not Judge Pfleger is right, the means that the Basel Convention lends to a coastal state wishing to influence on a shipment of materials are interesting to examine. Because if the Basel Convention is not applicable to nuclear transports, and there is a discrepancy between regulations of the two, it indicates that either that the area of nuclear transportation should be regulated in a different way or that there is a significant difference between nuclear and other hazardous wastes that makes the latter more worthy of protection.

First of all, we find under the definitions of the Basel Convention that a "transboundary movement" includes traversing "*through an area under the national jurisdiction of another State*"[190]. Such an area is defined as "*any land, marine area or airspace within which a State exercises administrative and regulatory responsibility in accordance with international law*"[191] This clearly includes not only the territorial waters, but also the EEZ, as the latter is an area *sui generis*, in which the coastal state has a limited jurisdictional right in contrast to the high seas character of *res communis omnium.* Hence, we find that when a transport is scheduled to traverse the territorial waters or the EEZ of an *en route* coastal state being also a party to the Basel Convention; the state is defined as a "transit state".[192] Should the *en route* coastal state not be a party to the Basel Convention they still classify under "states concerned".[193] Note that the Basel Convention explicitly defends the right to freedom of navigation and innocent passage; but also the coastal states rights in their EEZs and territorial waters.[194]

The Basel Convention also emphases the principle of cooperation, similar to the result of the MOX-plant case.[195] This can be seen as another argument in favour of that the cooperation principle must be attended to, not only between neighbouring countries but in situations of transport. As the principle of cooperation is a general principle of international law, this serves as an argument in favour of the coastal states right to information, even though the Basel Convention is not[196] directly applicable to radioactive materials.

Furthermore, the Basel Convention prescribes that the exporter must notify each state

189 "El Juez Federal de Chubut Hizo Lugar a una Medida Cautelar Presentada por el Gobernador das Neves y Prohibio el Ingreso de un Barco con Basura Nuclear a Aguas Argentinas", News article from the Chubut governmental homepage, http://www.chubut.gov.ar/noticias_old/archives/2004_01.php, See also Currie, D. E. J. and Van Dyke, J. M., "Recent Developments in the International Law Governing Shipments of Nuclear Materials and their Implications for SIDS", p 119.

190 Art 2.3 Basel Convention

191 Art 2.9 Basel Convention

192 Art 2.12 Basel Convention

193 Art 2.13 Basel Convention

194 Art 4.12 Basel Convention

195 Art 4.2 (h) and Art 10 Basel Convention

196 Unless Judge Pfleger is right in the San Onofre-case.

concerned[197]. States of transit may respond "*consenting to the movement with or without conditions, denying permission for the movement, or requesting additional information.*"[198] States of transit that are not parties to the convention are still entitled to receive a notification, although their reply is not needed for the shipment to commence.[199]

Finally, the Basel Convention does not seem to allow an unconditional ban of transit shipments; although a ban on imports is possible. However as the Basel Convention provides for a notification procedure as described above, it is theoretically possible for a state to refuse permission every time a shipment is scheduled through their territorial waters or EEZ.

As a conclusion, coastal state control within the Basel Convention system is far reaching. Apart from a general demand on cooperation and providing information on request; notification is necessary before any shipment of hazardous waste through a coastal states EEZ or territorial waters. In case the coastal state is a party to the convention, such a transport may not take place without prior consent.

However, the Basel Convention has explicitly excluded nuclear materials from its scope. It is not likely that arguing that the lack of a similar regulation in the area of nuclear transports makes the Basel Convention applicable. However, acknowledging that much less dangerous, although still hazardous materials are thoroughly regulated in the Basel Convention whilst nuclear materials are excepted from this practice is a good argument for an improvement of the latter regulation.

3.5. Evaluation and Conclusions

The main conclusion of this section is that the UNCLOS does leave some room for taking into consideration environmental concerns of coastal states. However, it is not clear what measures that are reasonable within this room of manoeuvre. It is clear though, that many countries consider themselves entitled to information and consultation, with a right to ban a certain transport that does not live up to their environmental standards.

Perhaps it is possible to use a deductive reasoning to illustrate why many countries argue that their demands on prior consent or prior information are legal according to the UNCLOS. They may argue that the main purpose is not to restrict the freedom of navigation. The right of navigation is restricted as a consequence of the main purpose, which is to protect the environment. Furthermore, the restriction of certain types of traffic in the short run may actually be the a way to preserve the possibility of any navigation in the long run, as the consequence of an accident would result in a complete restriction of the freedom of navigation for all traffic.

Following this line of reasoning, a restriction on certain traffic is reasonable, considering that this traffic's right to freedom of navigation may unjustly bereave all other traffic this right for an indeterminable amount of time.

197 I.e. including all transit states, also those who are not parties to the Basel Convention. See Art 6 Basel Convention.
198 Art 6.4 Basel Convention
199 Art 7 and 6.1 Basel Convention

4. REFLECTIONS AND CONCLUSIONS

4.1. Reflections

As repeatedly shown, it is, according to international law not possible to issue a ban on *en route* shipments of spent nuclear fuel through coastal states waters. Still, this have been frequently and successfully done; despite exceeding the coastal state mandate according to international law. The U.S. refrained from shipping the *San Onofre* nuclear reactor around the Cape Horn. Requests or bans from South America, Portugal, New Zealand, Brazil, Nauru and Kiribati of the substance that specific shipments of Japanese plutonium stay out of their EEZs was also complied with. Many other countries made reservations in the UNCLOS, although they are strictly speaking, not binding. Thus, one may wonder; why does it work?

One answer may be that there is a new state practice with the content that states have a right to ban or demand prior consultation when it comes to the transboundary transport of spent nuclear fuel. However, complying countries have been careful with pointing out that their adherence is not due to written or customary law; but to adhere to friendly requests. Thus, the argument for a new state practice is not very convincing.

A second answer may be found in *ad hoc* Judge Székely's and *ad hoc* Judge Shearers statements on that the tribunals are inclined to resort to diplomacy, in the *MOX plant case* and the *Southern Bluefin Tuna case*, respectively. Judge Shearer expressed it in these words:

> It seems to me, with respect, that the Tribunal, in its prescription of measures in this case, has behaved less as a court of law and more as an agency of diplomacy. While diplomacy, and a disposition to assist the parties in resolving their dispute amicably, have their proper place in the judicial settlement of international disputes, the Tribunal should not shrink from the consequences of proven facts. [200]

My point is that in the international arena, diplomatics, or realist power politics still weigh heavier than the rule of law. Thus, countries generally seek to keep other nations happy; anything else would be asking for trouble. Especially due to the hazardous nature of spent nuclear fuel as cargo, it is understandable that the shipping nations prefer to sail the high seas, as to avoid starting an international conflict. As all countries, except possibly France or Finland, struggle against a public inclined to question the practice of nuclear power, if given opportunity, most companies engaging in this trade quite wisely seem to try to keep a low profile. This is an order that has worked in the past.

However, I argue here that in the case that the number of nuclear transports and parties on the market increase further, the problem will be of a different magnitude. This is likely to further trigger coastal state concern; either to demand new regulations at an international level, or simply to issue a nuclear transport ban; as have worked previously. At the same time, the number of routes for transboundary transportation are limited. If a shipping state is confronted with ban's to stay out of enough EEZs as to not be able to complete the journey, they are likely to try to assert the rights to free navigation and innocent passage, that they are entitled to according to the UNCLOS.

In that situation, political argumentation is not likely to work. Bearing in mind that many of the states concerned are small island states; it is not unlikely that they will have to give in to political pressure from economically and militarily more powerful states. Hence, I argue that

200 Separate opinion of Judge *ad hoc* Shearer, Southern Bluefin Tuna Cases (Australia v. Japan; New Zealand v. Japan), Provisional Measures, Cases No. 3 and 4, ITLOS.

perhaps a better solution than relying on that a realist political view of the world will keep balancing the rights of coastal states with flag states rights is to create a more complete and comprehensive regulation for the transport of nuclear waste, than the patchwork of legislation currently in use.

4.2. Conclusions

Recalling the questions posed in the introduction; I set out to examine what possibilities that an *en route* coastal state has to be informed about, and influence on, a certain shipment of spent nuclear fuel; in its territorial waters, the EEZ and the high seas.

To find the answer of this question, I began with examining what principles that may be of relevance to understanding where the actual conflict lies. The examination began with nuclear law; the principles of transparency, safety and security was initially discussed. Although that the dual usage areas of nuclear material and the military history of nuclear research has been an argument in favour of secrecy; the introduction of a peaceful nuclear industry have resulted in that, at least on a national level, democratic demands on transparency and public access to information have replaced the initial tradition of secrecy. At the same time, the fear of terrorism and increasing resistance from the public and other countries was arguments to keep secrecy about nuclear transports.

It was also concluded that the principles of compliance and international cooperation were strong incentives for transboundary information about nuclear practices in general. Secondly, as noted when moving into the area of environmental principles, the principle of cooperation is a customary principle of international law. The discussion on environmental principles was focussed on the principles of cooperation, the sovereignty principle the preventive and the precautionary principle. The first three are general principles of international law; the precautionary principle is especially strong in the EC. There are reasons to believe that the latter is about to become internationally accepted, although it can not be said to be there yet; it has been used as a base for decisions by international tribunals, although not explicitly named.

Thus, it was found that the principles of free navigation and innocent passage were the main obstacles to increased coastal state control. However, it was also shown that the UNCLOS is constructed to adjust with changes in the international legal sphere, as to not become outdated too fast. There are also obligations within the UNCLOS to cater for the environment, something that indicates that new environmental principles should be taken into account when construing the extent of the freedom of navigation and innocent passage.

When analysing the case law and the actual legislation concerning transboundary nuclear transportation it was found that the UNCLOS is the controlling treaty when it comes to coastal state control; as other legislation on nuclear transportation mostly address technical questions on security and safety issues; such as the design of the containers, the vessels and the flasks. However, whether or not the UNCLOS allowed coastal state control could not be said with authority. In combination with the case law, it was found that a coastal state may probably demand prior information, but a total ban is out of the question.

As seen in the reservations to the UNCLOS, many countries find that they have a right to give prior consent; however, other states proclaim that there is not even a right to prior information. The examples of the Basel Convention and the situation in the EC are further

argument for that a system of prior notification and consent should be applicable also for nuclear cargo. In these situations there is no right to refuse a shipment that is in accordance with international rules; but it provides a tool for the countries to receive advance information and to be able to control that the environmental impact assessment and contingency plans are correctly executed. We have seen in the example of oil tanker regulation that the EC are capable to bring the rest of the international community with them in implementing higher standards; it is not unlikely that this may work also with the issue of nuclear materials. As can be seen in Appendix I of this thesis, the United Kingdom and Netherlands were the only two countries issuing reservations against coastal state control in this issue.[201] As both the United Kingdom and the Netherlands are part of the EU, they are not likely to insist on this standpoint; such persistence would only lead to that they would have to adhere to stricter demands than would the rest of the world. The revised EC directive on controlling shipments of radioactive waste was issued as late as the 20th November 2006[202] and is not to be finally implemented until the end of 2008. The major difference with this directive was, as concluded above, that it does not except spent fuel for reprocessing. Thus, would a shipment such as the ones between Japan and France/United Kingdom take place today; there would be a mandatory notification and prior consent procedure applying at least to European waters.

At the moment, however, it is likely that the EC regulation on nuclear materials, together with the Chilean Nuclear Safety Law and the other countries that demand prior consent, actually are in conflict with the UNCLOS. Thus, the main conclusion of this thesis is that although the legislation of today is a patchwork of different treaties, from which a straight answer concerning the legal status of coastal state influence on *en route* shipments is hard to extract; seemingly it is an area in transition. If transports of nuclear materials are to continue, it is certain that these are issues that will have to be resolved. The better solution is probably to include a section in the Joint Convention, defining what rights coastal states have to influence *en route* shipments; perhaps modelled after the EC regulation or the Basel Convention. However, to directly include nuclear materials into the Basel Convention is not likely to be a good idea, as many countries still wish to reserve their right to ship their nuclear waste to a common terminal storage situated in another country.

4.3. Postscript

The purpose of this final section is to recall the example of AB SVAFO, mentioned in the beginning and to apply the results of this thesis to examine why they decided to keep concerned parties informed.

As the old EC directive did not include transport of spent fuel for reprocessing and the new directive has yet to be implemented, we find that AB SVAFO had no obligation to share information to *en route* states. Instead, this thesis has shown that the reason why AB SVAFO chose to disclose the transport to the concerned coastal states was not out of legal obligation, but of diplomatic reasons, based on an emerging new perspective, shifting the coastal state/flag state balance. Also, AB SVAFO are likely to be extra sensitive to current trends in international legislation not to attract more public attention than necessary, as the issue of exporting spent fuel in contrast with the Swedish nuclear policy is delicate.

201 However, there are likely to be other countries also opposing this, which has not chosen to issue statements when ratifying the UNCLOS.

202 Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel.

APPENDIX I: RESERVATIONS UPON RATIFICATION OF THE UNCLOS

Many countries have made reservations in connection to the transboundary transport of nuclear materials in accordance with Art 310 UNCLOS. This list is compiled citing relevant sections from the UN official list of reservations.[203] In the following they are sorted depending on their view on coastal state control. Netherlands and Great Britain have stated that they do not accept any states demand on prior notification in the case of nuclear transport. The rest of the countries favour this interpretation.

Does not accept prior notification

Netherlands
"The Convention permits innocent passage in the territorial sea for all ships, including foreign warships, nuclear-powered ships and ships carrying nuclear or hazardous waste, without any prior consent or notification, and with due observance of special precautionary measures established for such ships by international agreements. "

Great Britain
"The United Kingdom cannot accept any declaration or statement made or to be made in the future which is not in conformity with articles 309 and 310 of the Convention. Article 309 of the Convention prohibits reservations and exceptions (except those expressly permitted by other articles of the Convention). Under article 310 declarations and statements made by a State cannot exclude or modify the legal effect of the provisions of the Convention in their application to the State concerned.

The United Kingdom considers that declarations and statements not in conformity with articles 309 and 310 include, inter alia, the following: [...]

- those which purport to require any form of notification or permission before warships or other ships exercise the right of innocent passage or freedom of navigation or which otherwise purport to limit navigational rights in ways not permitted by the Convention;"

In favour of increased coastal state control

Argentine
"(e) The Argentine Republic fully respects the right of free navigation as embodied in the Convention; however, it considers that the transit by sea of vessels carrying highly radioactive substances must be duly regulated.

The Argentine Government accepts the provisions on prevention of pollution of the marine environment contained in Part XII of the Convention, but considers that, in the light of events subsequent to the adoption of that international instrument, the measures to prevent, control and minimize the effects of the pollution of the sea by noxious and potentially dangerous substances and highly active radioactive substances must be supplemented and reinforced."

Bangladesh
"4. Bangladesh is of the view that such a notification requirement is needed in respect of

203 http://www.un.org/Depts/los/convention_agreements/convention_declarations.htm

nuclear-powered ships or ships carrying nuclear or other inherently dangerous or noxious substances. Furthermore, no such ships shall be allowed within Bangladesh waters without the necessary authorization. “

Egypt
“Declaration concerning the passage of nuclear-powered and similar ships through the territorial sea of Egypt

Pursuant to the provisions of the Convention relating to the right of the coastal State to regulate the passage of ships through its territorial sea and whereas the passage of foreign nuclear-powered ships and ships carrying nuclear or other inherently dangerous and noxious substances poses a number of hazards,

Whereas article 23 of the Convention stipulates that the ships in question shall, when exercising the right of innocent passage through the territorial sea, carry documents and observe special precautionary measures established for such ships by international agreements,

The Government of the Arab Republic of Egypt declares that it will require the aforementioned ships to obtain authorization before entering the territorial sea of Egypt, until such international agreements are concluded and Egypt becomes a party to them.”

Malaysia
“4. In view of the inherent danger entailed in the passage of nuclear-powered vessels or vessels carrying nuclear material or other material of a similar nature and in view of the provision of article 22, paragraph 2, of the Convention on the Law of the Sea concerning the right of the coastal State to confine the passage of such vessels to sea lanes designated by the State within its territorial sea, as well as that of article 23 of the Convention, which requires such vessels to carry documents and observe special precautionary measures as specified by international agreements, the Malaysian Government, with all of the above in mind, requires the aforesaid vessels to obtain prior authorization of passage before entering the territorial sea of Malaysia until such time as the international agreements referred to in article 23 are concluded and Malaysia becomes a party thereto. Under all circumstances, the flag State of such vessels shall assume all responsibility for any loss or damage resulting from the passage of such vessels within the territorial sea of Malaysia.”

Malta
“Malta is also of the view that such a notification requirement is needed in respect of nuclear-powered ships or ships carrying nuclear or other inherently dangerous or noxious substances. Furthermore, no such ships shall be allowed within Maltese internal waters without the necessary authorization. “

Oman
“Declaration No. 3, on the passage of nuclear-powered ships and the like through Omani territorial waters

With regard to foreign nuclear-powered ships and ships carrying nuclear or other substances that are inherently dangerous or harmful to health or the environment, the right of innocent passage, subject to prior permission, is guaranteed to the types of vessel, whether or not warships, to which the descriptions apply. This right is also guaranteed to submarines to

which the descriptions apply, on condition that they navigate on the surface and fly the flag of their home State."

Saudi Arabia

"6. In view of the inherent danger entailed in the passage of nuclear-powered vessels or vessels carrying nuclear material or other material of a similar nature and in view of the provision of article 22, paragraph 2, of the Convention on the Law of the Sea concerning the right of the coastal State to confine the passage of such vessels to sea lanes designated by the State within its territorial sea, as well as that of article 23 of the Convention, which requires such vessels to carry documents and observe special precautionary measures as specified by international agreements, the Kingdom of Saudi Arabia, with all of the above in mind, requires the aforesaid vessels to obtain prior authorization of passage before entering the territorial sea of the Kingdom until such time as the international agreements referred to in article 23 are concluded and the Kingdom becomes a party thereto. Under all circumstances, the flag State of such vessels shall assume all responsibility for any loss or damage resulting from the innocent passage of such vessels within the territorial sea of the Kingdom of Saudi Arabia."

Yemen

"2. The Yemen Arab Republic adheres to the concept of general international law concerning free passage as applying exclusively to merchant ships and aircraft; nuclear-powered craft, as well as warships and warplanes in general, must obtain the prior agreement of the Yemen Arab Republic before passing through its territorial waters, in accordance with the established norm of general international law relating to national sovereignty."

APPENDIX II: CHILE'S LAW FOR NUCLEAR SAFETY

The following excerpt is Art 4 of Chile's law for Nuclear Safety.[204] It is cited in original language as amended to this date. Emphasis is added by the author of this thesis; as well as the (unauthorized) translation into English below.

Art. 4. Para el emplazamiento, construcción, puesta en servicio, operación, cierre y desmantelamiento, en su caso, de las instalaciones, plantas, centros, laboratorios, establecimientos y equipos nucleares y *para el ingreso o tránsito por el territorio nacional, zona económica exclusiva, mar presencial* y espacio aéreo nacional de sustancias nucleares o materiales radiactivos se *necesitará autorización de la Comisión*, con las formalidades y en las condiciones que se determinan en esta ley y en sus reglamentos. Las centrales nucleares de potencia, las plantas de enriquecimiento, las plantas de reprocesamiento y los depósitos de almacenamiento permanente de desechos radiactivos, deberán ser autorizados por decreto supremo, expedido por intermedio del Ministerio de Minería.

Para el otorgamiento de dichas autorizaciones deberán considerarse, en todo caso, las condiciones que permitan preservar un medio ambiente libre de contaminación. En el caso de la autorización para el transporte de las sustancias señaladas en el inciso primero, *se deberá dejar constancia de las fechas en que éste se efectuará, las rutas y áreas a utilizar, las características de la carga y las medidas de seguridad y de contingencia.*

No podrá autorizarse el almacenamiento de desechos nucleares o radiactivos en territorio nacional, salvo que se produzcan u originen en él.

Art. 4. For the siting, construction, renovation, operation, closing and dismantling of facilities, nuclear plants, centers, laboratories, establishments or equipment and *for the entrance or transit through the national territory, exclusive economic zone, territorial sea* and national airspace of radioactive nuclear or material substances *authorization of the Commission is necessary*, with the formalities and under the conditions that are determined in this law and its regulations. The nuclear power plants, the plants of enrichment, the reprocessing plants and permanent storage deposits of radioactive remainders, will have to be authorized by supreme decree, issued by interval of the Ministry of Mining.

For the granting of these authorizations they will have to consider, in any case, the conditions that allow preserving an environment free of contamination. In the case of authorization to the transports of substances indicated in the first paragraph *the applicant shall provide the dates of when the transport commences, the routes and areas traveled the characteristics of the load and the contingency and safety measures.*

The storage of nuclear or radioactive remainders in national territory will not be authorized, except for if they are produced or originate from there.

204 Ley de Seguridad Nuclear, LEY Núm. 18.302, 1984 (Chile's Law for Nuclear Safety) & Ley Núm. 19.825, 2002 modifica la ley nº 18.302, sobre Seguridad Nuclear (amendment to Chiles Law for Nuclear Safety).

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