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SALVAGE CONCERNS OVER FLOATING NUCLEAR POWER PLANTS

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TABLE OF CONTENTS

TABLE OF CONTENTS.....	1
List of Abbreviations.....	3
Chapter 1 INTRODUCTION	4
1.1 Background	4
1.2 Purpose and structure	4
Chapter 2 FLOATING NUCLEAR POWER PLANTS AS MARITIME PROPERTY SUBJECT OF SALVAGE.....	8
2.1 Definition of subjects of salvage	8
2.1.1. <i>The Gas Float Whitton No.2</i>	9
2.1.2 Merchant Shipping Act 1995 & International Convention on Salvage 1989	10
2.2 Navigable Craft.....	11
2.2.1 'Ship' and 'Vessel'	12
2.2.2 Other Structures	13
2.2.3 Navigation	15
2.3 Excluded subjects of salvage	17
2.3.1 Platforms and drilling units	17
2.3.2 Reason behind the exclusion	18
Chapter 3 FLOATING NUCLEAR POWER PLANTS UNDER TOWAGE	20
3.1 Preliminary considerations	20
3.1.2 Salvage distinguished from towage.....	20
3.1.2 A proper subject of salvage?.....	22
3.2 Salvage of towed property	23
3.2.1 Services rendered under existing contracts	23
3.2.2 Contribution of Tug and Tow	26
3.3 Floating Nuclear Power Plants under towage	28
3.3.1 <i>Maridive VII v Key Singapore</i>	29

Chapter 4 NUCLEAR CARGOES AND ENVIRONMENTAL SALVAGE	32
4.1 Property ancillary to Floating Nuclear Power Plants	32
4.1.1 Apparel	32
4.1.2 Cargo	34
4.2 Dangerous, Hazardous and Harmful Cargoes	35
4.2.1 Radioactive Materials Regulation.....	36
4.2.2 Floating Nuclear Power Plants particular threats	38
4.3 Environmental Salvage.....	40
4.3.1 International Convention on Salvage 1989 & Lloyd's Open Form	41
4.3.2 The Special Compensation of P&I Clause	43
Chapter 5 CONCLUSION.....	45
BIBLIOGRAPHY	48

List of Abbreviations

FNPP	Floating Nuclear Power Plant
HNS Convention	International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea
IAEA	International Atomic Energy Agency
IMDG Code	International Maritime Dangerous Goods Code
INF Code	International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Waste on Board Ships
LOF	Lloyd's Open Form
MARPOL	International Convention for the Prevention of Pollution from Ships
SCOPIC	Special Compensation P&I Clause
SOLAS	International Convention for the Safety of Life Sea at Sea

1.1 Background

Until the early 2000s, the use of nuclear energy in the oceans was limited to propulsion purposes in nuclear-powered submarines, aircraft carriers, or icebreakers. Nevertheless, the first Floating Nuclear Power Plant (FNPP) was built by the United States in the late 1960s; the vessel *Sturgis* operated in the Panama Canal from 1968 to 1975. The inception of the idea of constructing a Nuclear Power Plant that was not land-based. However, nuclear projects involve high costs and a lot of criticism from the public opinion, forcing most of these projects to be abandoned.

Recently, several countries are highly interested in projects concerning the creation of offshore nuclear energy production plants. The United States, Russia, China, France, South Korea, are leading the race to create an operational FNPP.¹ The *Akademik Lomonosov* is the first functioning FNPP created by the Russian corporation ROSATOM. It consist of a flush-deck, flat-bottomed, non-self-propelled vessel of the berth-connected type, operating in long-term moorings at dock. The structure was launched in 2019 and it is actually operating in the Chukotka region. Up to date, the *Akademik Lomonosov* is the only structure of its kind, but the Chinese government plans are to create another 20 vessels of this nature to start operating in a short-term period.²

The purpose of these structures is to provide energy to remote isolated regions that are otherwise unserviced, mainly coastal towns of difficult access, and offshore facilities.

1.2 Purpose and structure

This dissertation seeks to examine the possible issues arising from a Floating Nuclear Power Plant under the need of a salvage operation. The relatively new and innovating development of such structures presents several problems that

¹ Kang-Heon Lee, Min-Gil Kim, Jeong Ik Lee & Phill-Seung Lee, *Recent Advances in Ocean Nuclear Power Plants* (2015) Energies No. 8

² World Nuclear News, *CGN to build floating reactor* <www.world-nuclear-news.org/NN-CGN-to-build-floating-reactor-1301164.html> accessed 22 June 2020.

might lead to situations never approached before by the salvage industry. Due to the sensible nature of the structure and the property involved in the production of nuclear energy, it is crucial to analyse how the existing legal framework; Common Law, Statute Law and private instruments, could address the problems here presented.

The argument intended to develop is a step by step view of the possible salvage situations and related problems that could emerge from this particular structure. This dissertation mainly comprises three parts, from Chapter 2 to Chapter 4, in which the following issues are attached:

Chapter 2 contains considerations in respect of the nature of the structure itself. Concerning principally the qualification of a FNPP as property subject of salvage.

For this purpose, the existing legal framework will be examined. With the view provided by the Admiralty Court, establishing the traditional subjects of salvage, and the provisions in this respect from the International Convention on Salvage 1989. To determine whether a FNPP can be considered a proper subject of salvage, the definitions of vessel and ship provided from both the Statutes and Case Law will be reviewed. The interpretation in this matter is large, as the definitions from the Salvage Convention 1989³ are found to be rather wide and inclusive. Thus, particular attention will be given to considerations over structures that share similarities with FNPP, such as 'Jackup Rigs' and other 'offshore' facilities, in order to provide with a close analysis in respect of a structure which is the only one of its kind.

The exclusions of static objects from salvage provided by Salvage Convention 1989 will be also examined, as it explicitly refers to "floating platforms". Thus, analysing which structures are to be excluded from salvage under this provision, and under what particular circumstances shall this exclusion operate. Therefore, if it could be applicable, as drafted in the Salvage Convention 1989, to a FNNP. Moreover, review the reasons behind the incorporation of this exclusion into the

³ International Convention on Salvage 1989

Salvage Convention 1989, and if it could be appropriate to exclude from salvage structures such as FNPP under the seam reasoning.

Chapter 3 contains considerations in respect of salvage rendered to a FNPP while it is under towage. Thus, considering if a FNPP can be subject to salvage as towed property when it is moving from one place to another, and the issues that could arise from a salvage operation involving a towage convoy.

For this purpose, the relation between towage and salvage will be examined. The requirements established, by both Common Law and the Salvage Convention 1989, to convert a towage operation into a salvage operation. The status and apportionment of liability of each part of the convoy, considering different scenarios in respect of the ownership of the convoy parts for contribution. All examined under the scope of the structure subject of study. Thus, recalling cases in which the structure towed is similar to a FNPP, such as 'Jackup Rigs', in order to consider its peculiarities and provide a close analysis of the possible arising issues.

Chapter 4 contains considerations in respect of the nature of the property transported in a FNPP. Concerning principally the qualification of such property as subject of salvage, the existing regulations for the carriage of dangerous goods and the possible scenario of environmental salvage.

For this purpose, the property considered will be the nuclear fission reactors, nuclear fuel and radioactive waste. Thus, examine if such property should be treated as cargo or apparel of the structure, if it would qualify as subject of salvage in order to contribute for a reward and the possible issues that may arise in respect of its salvage.

The regulations in respect of carriage of dangerous goods that will be of relevance for our subject of study, in particular considering nuclear materials. Thus, examine the provisions in respect of safety concerns and third party liability when such cargoes are involved. Identifying the particular threats of a FNPP in respect of the property above mentioned, which will lead to the analysis of a potential environmental salvage situation. Thus, examine how the International

Convention on Salvage addresses the environmental issue and how the salvage industry has developed in this sensible field.

In order acquire an advisable solution to be used in these multiple scenarios, the paper through all the progress of the argument renders special interest in professional salvage under private salvage contracts, in the form of Lloyd's Open Form (LOF), and how can this instrument address the issues here presented.

Chapter 2 FLOATING NUCLEAR POWER PLANTS AS MARITIME PROPERTY SUBJECT OF SALVAGE

Qualification of a property as an element subject to salvage is crucial to determine whether such particular property is legible for a salvage reward and who is liable to contribute in the operation. Therefore, it is necessary to identify the particular subjects of salvage in order to value the interests preserved and to quantify the fund in respect of which the salvor is to be awarded.⁴

The aim of this chapter is to determine whether a Floating Nuclear Power Plant can be considered as property subject to salvage under the existing legal framework, analysing the view provided by the Admiralty Court and the regulation from the statutory law provisions.

2.1 Definition of subjects of salvage

Not all property at sea falls under the consideration of proper subject of salvage. The multiple case law and continued regulation arising from this issue shows that this question presents a rather controversial issue, which it is constantly being reviewed and developed due to several technical improvements and innovation in the maritime world.

The view presented by *The Gas Float Whitton No.2*⁵ settles the basis of this question, as it is considered to be the leading case in this matter. Thus, following the decision resulting from this case, the Admiralty Court has no salvage jurisdiction over a subject which is not qualified as a subject of salvage by either Common Law, the High Court of Admiralty or legislation.⁶

Therefore, there are a listed number of properties that at first glance fall under the inherent jurisdiction of the Admiralty Court, which are: the vessel, its apparel, cargo, freight and wreck. As well as another number of properties latter included to the admiralty jurisdiction by statute, which are: lives, aircraft and hovercraft.⁷

⁴ Francis D Rose, *Kennedy & Rose: Law of Salvage* (9th edn, Sweet & Maxwell 2017) para 4-002

⁵ *Wells v The Owners of the Gas Float Whitton No.2 (The Gas Float Whitton No.2)* [1897] A.C. 337

⁶ *Rose* (n 4) para 4-003

⁷ *ibid*

Particularly, considerations over what exactly is understood as a ‘vessel’ would be of great importance in this chapter. Thus, further analysis will be provided under both Common Law and Statute Law in order to determine whether a FNPP can be considered a ‘vessel’ for salvage purpose.⁸

2.1.1. *The Gas Float Whitton No.2*

The facts of the case were as follows; a light float was moored in tidal waters with the purpose of giving light to other vessels. The light float in question was shaped like a ship, but it was never intended to be used for navigation, nor it was suitable for such activity. Due to a gale it got adrift, plaintiffs of the case helped to secure the light float until the Trinity House⁹ took charge of the situation. The plaintiffs managed to successfully bring an action for salvage at the county court, who held that the light float was considered a vessel in order to entitle the court to exercise statutory jurisdiction. The Divisional Court disagreed when considering the light float as a vessel. Nonetheless, affirmed that the courts had jurisdiction at common law, as the light float was a structure connected to navigation and exposed to perils of the seas over the matter. However, none of the previous reasonings was accepted by the Court of Appeal or the House of Lords, as both pronounced against the claim.

The importance of the case in respect of our analysis resides in the definition of ‘subjects of salvage’ provided in the Court of Appeal by Lord Esher M.R., who concluded¹⁰:

“I come, therefore, to the conclusion that by the common or original law of the High Court of Admiralty the only subjects in respect of the saving of which salvage reward could be entertained in the Admiralty Court were ship, her apparel and cargo, including flotsam, jetsam, and lagan, and the wreck of these and freight; that the only subject added by statute is life salvage; and that the county court has no right to exercise jurisdiction with regard to any other subject-matter than that which might be entertained by the High

⁸ See 2.2 below.

⁹ The Trinity House is the official authority for lighthouses in England. Responsible for the provision and maintenance of navigation aids such as the light float in question.

¹⁰ *The Gas Float Whitton No.2* [1896] P.42 at 63-64

Court of Admiralty. Whether salvage could be granted for the saving of what is called a lightship may be doubtful. I incline to think not: if it could be, it is only because the lightship would be held to be a ship. As to some instances which were proposed—such as the Victory in Portsmouth Harbour—I have no doubt that she is a ship. So was the Dreadnought, used for years as a hospital. So is a ship used as a coal hulk. But the thing in question on this appeal is not a ship in any sense.”

Furthermore, the Divisional Court idea of the light float being connected to navigation was directly rejected by Lord Herschell, who said ¹¹:

“I do not think the extension of it [admiralty jurisdiction] to a floating beacon can be justified merely because it is property connected with navigation; and I think it would not be easy to define the limits of the jurisdiction if it were so extended.”

Thus, from this judgement we can out set two considerations ¹²: (1) The abovementioned rule for which the only considered subjects of salvage in Admiralty law are those qualified as such by the High Court of Admiralty and by statute. And (2) that in Admiralty law, subjects of salvage comprehend only property involved in navigation.

2.1.2 Merchant Shipping Act 1995 & International Convention on Salvage 1989

The Merchant Shipping Act 1995 Part IX Chapter 1 Section 224, enacts into English Law the International Convention on Salvage 1989. Thus, providing this international Convention with the force of law.

The Merchant Shipping Act 1995 does not provide a detail definition of subjects of salvage. However, attending the Salvage Convention 1989 we can find some broad general definitions and applications of the Law of Salvage, which can clearly be related to the view presented in the judgement from *The Gas Float Whitton No.2*.

¹¹ *The Gas Float Whitton No.2* (n 5) at 343

¹² *Rose* (n 4) para 4-009

Salvage Convention 1989 Article 1 provides:

“For the purpose of this Convention:

(a) Salvage operation means any act or activity undertaken to assist a vessel or any other property in danger in navigable waters or in any other waters whatsoever.

(b) Vessel means any ship or craft, or any structure capable of navigation.

(c) Property means any property not permanently and intentionally attached to the shoreline and includes freight at risk.”

The Salvage Convention 1989 Article 1 (a) provides with a definition of “Salvage operation” directly attending to the concept of ‘vessel’ and ‘any other property in danger’. Definitions of ‘vessel’ and ‘property’ for such purpose are stated in the following Salvage Convention 1989 Articles 1 (b) and (c). Thus, gathering the two main considerations as presented in *The Gas Float Whitton No.2*; the traditional subjects of salvage as considered by the High Court of Admiralty, and the requirement of such subjects to be property involved in navigation.

Following the definition of property from Salvage Convention 1989 Article 1 (c), the general exclusion from salvage of static objects provided by *The Gas Float Whitton No.2*¹³ is also brought into statutory force. In this regard, draftsmen from the Convention were forced to consider oil rigs and oil platforms and frame whether these structures are capable of being salved.¹⁴ Thus, by Salvage Convention 1989 Article 3 ‘fixed or floating platforms’ are expressly excluded in certain circumstances.¹⁵

The wording from Salvage Convention 1989 Article 1 leads to further discussion, as the concepts ‘any other property’, ‘Vessel’ and ‘any structure capable of navigation’ provide of a wide scope of interpretation.

2.2 Navigable Craft

¹³ *The Gas Float Whitton No.2* (n 5) at 346

¹⁴ John Reeder, *Brice on Maritime Law of Salvage* (5th edn, Sweet & Maxwell, 2011) para 3-05

¹⁵ See 2.3 below.

To determine whether a FNPP is subject of salvage under the Salvage Convention 1989, it is necessary to analyse if it falls under the definition of 'vessel' provided by both common law and statute, and if it could be understood as an 'structure capable of navigation'.

2.2.1 'Ship' and 'Vessel'

The current definition of 'ship' in the Merchant Shipping Act 1995 defines it without defining a vessel¹⁶, Section 313 (1) provides that:

"Ship' includes every description of vessel used in navigation"

However, a 'vessel' for the purposes of Salvage¹⁷ is defined in the Merchant Shipping Act 1995 Section 225 (1) as including "any ship or boat, or any other description of vessel used in navigation". Corresponding to a definition that can be found in legislation enacted a century earlier by section 742 of the Merchant Shipping Act 1894.

Attending to Salvage Convention 1989 Article 1 (b), a 'vessel' is defined as:

"any ship or craft, or any structure capable of navigation."

This wording provides of a new concept; 'craft'. A 'craft' would normally be understood as a "boat or ship"¹⁸. However, it is thought to encompass a wider concept than 'ship'.¹⁹ Thus, being able to cover structures such a raft, dredger, hulk or hovercraft.

Moreover, the concept of capability to navigate attaches to 'structures' different from 'ship' or 'craft', as the comma after the word "craft" is said to be deliberate and significant.²⁰ Thus, a 'ship' or 'craft' do not need to be "capable of navigation", as for this concept only qualifies the expression "any structure".²¹

¹⁶ Gotthard Mark Gauci, *Is It a Vessel, a Ship or a Boat, Is It Just a Craft, Or Is It Merely a Contrivance?* (October, 2016) Journal of Maritime Law & Commerce, Vol. 47, No. 46

¹⁷ Merchant Shipping Act 1995 Pt IX

¹⁸ 'Craft' In Oxford Online Dictionary. Retrieved from <<https://en.oxforddictionaries.com/definition/craft>> accessed 2 July

¹⁹ Brice (n 14) para 3-07

²⁰ *ibid*

²¹ *ibid*

Attending to law prior to merchant shipping legislation, there is not a customary interpretation of the words ‘vessel’ and ‘ship’. These terms have been used in other legislation and interpreted in different ways from the Merchant Shipping Act 1995.²² In *Ferguson v Hutchinson*²³ it was held that inclusions of definitions of ‘ship’ or ‘vessel’ in legislation were to be read in an inclusive way, as the policy of legislature is to enlarge, rather than to narrow, the definition of ‘ship’.²⁴

2.2.2 Other Structures

Section 311 of the Merchant Shipping Act 1995 used to provide that Secretary of State may by order decide that a thing designed or adapted for use at sea, is or is not to be treated as a ship for the purposes of any specified provision of this Act. However, this provision has been repealed²⁵ and replaced by Section 112 (1) of the Railways and Transport Safety Act 2003. It provides that Secretary of State may by order decide for a shipping provision to apply, not to apply or to be modified in its application, in relation to specified things which are used, navigated or situated wholly or partly in or on water.

Therefore, it is possible for the Secretary of State to extend the provisions from the Merchant Shipping Act 1995 and the Salvage Convention 1989 to structures, such as FNPPs as it is our subject of study, which might not be considered as ‘ships’ or ‘vessel’ in such provisions.

Through the development of the Law of Salvage over the years, we can clearly observe how this extension has been made. For instance, hovercraft and aircraft haven been subject of this extension. Under the existing law, it has been held that a reclamation dredger shaped like a ship and moved from one place to another for work, was a ship and also involved in navigation.²⁶ In the same way a hopper-barge without any means of propulsion has been considered a ship in multiple occasions.²⁷ Also, as we have previously mentioned, Lord Esher in *The*

²² In different legislation from admiralty, ‘ship’ has been considered to be an “establishment” within the Sex Discrimination Act 1975 and “equipment” within the Employer’s Liability Act 1969

²³ *Ex p. Ferguson* [1871] L.R. 6 QB 280

²⁴ *Rose* (n 4) para 4-021

²⁵ Railway and Transport Safety Act 2003, S.112 (8)

²⁶ *Cook v Dredging & Construction Co Ltd* [1958] 1 Lloyd’s Rep. 334

²⁷ *The Mac* [1882] 7 P.D. 126; *The Mudlark* [1911] P. 116; *The Harlow* [1922] P. 175; *The Champion* [1934] P. 1.

*Gas Float Whitton No.2*²⁸ considered a dreadnought, used for years as a hospital, and a coal hulk as ‘ships’.

In *The Raft of Timber*²⁹ it was held that a raft was “is neither a ship nor sea-going vessel”. However, in *The Gas Float Whitton No.2*³⁰ Lord Herschell concluded that “rafts are frequently so constructed as to be in a sense navigated: they are capable of being and are steered. They often have crews resident on board; they are used for the transport, from place to place, by water...” Therefore, a different conclusion may be reached under the actual Salvage Law in *The Raft of Timber*, as a raft may be considered a “structure capable of navigation” under Salvage Convention 1989 Article 1(b).

*Perks v Clark*³¹ presents a more recent dispute over considering a ‘Jackup Rig’ as a ‘Ship’. This case can be of high relevance to our subject of study, as ‘Jackup Rigs’ share some similarities with floating platforms. They are described as a type of mobile platform consisting of a buoyant hull with retractable legs which could be lowered to stand on the seabed, and retracted upwards to enable the floating hull to be towed from place to place. They have no engines of their own, no means of self-propulsion and therefore needed to be towed.³² The facts of the case involve a group of taxpayers who were employed aboard the ‘jackup’ rig. The taxpayers appealed against the refusal of their claims for relief for foreign emoluments. They did not qualify for the relief generally but claimed that they did qualify under the special provisions for the employment of seafarers.³³ Employment as a seafarer is defined as “employment consisting of the performance of duties on a ship”³⁴. The general commissioners decided that the rigs were ‘ships’ referring to the definition provided by the Merchant Shipping Act 1995, so that the taxpayers qualified for relief. But, this decision was reversed holding that the rigs did not have sufficient of the characteristics of ships to be

²⁸ *The Gas Float Whitton No.2* (n 10)

²⁹ *The Raft of Timber* (1844) 2 W. Rob. 251 at 255

³⁰ *The Gas Float Whitton No.2* (n 5) at 345.

³¹ *James Edward Perks v David Clark (HM Inspector of Taxes) (Perks v Clark)* [2001] 2 Lloyd’s Rep. 431 CA

³² *Ibid* at 19

³³ *Perks v Clark* [2001] EWCA Civ 1228

³⁴ Income and Corporation Taxes Act 1988 para. 3(2A) of Sch. 12; Income Tax (Earnings and Pensions) Act 2003 s.385 (1)

treated as ships for the purposes of the Income and Corporation Taxes 1988 Act. It was held that their use in navigation was incidental to their real function as rigs.³⁵ The taxpayers appealed to the Court of Appeal.

In the Court of Appeal, Longmore L.J.³⁶ said that to encourage a consistency of approach, it would be unsatisfactory to treat 'submersible / semi-submersible oil rigs' and 'jackup rigs' differently from drilling ships and barges, which seem *prima facie* to fall within the definition of vessel,³⁷ even though they are all different forms of structure. However, where the legs of the structure are resting on the seabed, there will be a very strong argument that the structure is not a vessel.³⁸

2.2.3 Navigation

Where there is a dispute over considering a structure subject of salvage, it is suggested that; the test whether something is or was at the time of the casualty involved in navigation is a useful guidance to ascertain this issue.³⁹

In *The Gas Float Whitton No.2*⁴⁰, Lord Herschell said that defining a 'ship' or 'vessel' involves various relevant factors, not just simply applying a precise general test. However, the definition provided by The Merchant Shipping Act 1995⁴¹ is restricted to 'vessels' "used in navigation", so the concept of navigation becomes essential.

This will exclude static objects or objects fixed in position, such as piers⁴² or buoys⁴³, and also oil rigs⁴⁴. But, the fact that an object is usually moored and does not have its own means of propulsion may not be conclusive, as we have seen earlier with a cases where a reclamation dredger was considered a 'ship' and used in navigation⁴⁵ and a hopper-barge was considered a 'ship'.⁴⁶

³⁵ *Perks v Clark* (n 33) as per Ferris J ([2000] BTC 133)

³⁶ *Perks v Clark* (n 31) at 57

³⁷ Richard Shaw, *The 1989 Salvage Convention and English law*, [1996] L.M.C.L.Q. 202 at 210.

³⁸ *Gauci* (n 16); Thomas Schoenbaum, *Admiralty and Maritime law* (3rd edn, West Publishing Co, 2001)

³⁹ *Rose* (n 4) para 4-011

⁴⁰ *The Gas Float Whitton No.2* (n 5) at 345

⁴¹ Merchant Shipping Act 1995 Art. 313 (1)

⁴² *The Craighall* [1910] P. 207

⁴³ *The Gas Float Whitton No.2* (n 5); *The Upcerne* [1912] P. 160

⁴⁴ See 2.3 below

⁴⁵ *Cook v Dredging* (n 26)

⁴⁶ *The mac; The mudlark; The Champion* (n 27)

In *Steedman v Scofield*⁴⁷, Sheen J in respect of ‘Navigation’ concluded:

“Navigation is the nautical art or science of conducting a ship from one place to another. The navigator must be able (1) to determine the ship’s position and (2) to determine the future course or courses to be steered to reach the intended destination. The word ‘navigation’ is also used to describe the action of navigating or ordered movement of ships on water... To my mind the phrase ‘used in navigation’ conveys the concept of transporting persons or property by water to an intended destination...”

‘Navigation’ is not synonymous with movement on water. Navigation is planned or ordered movement from one place to another.”

In the same way, in *R v Goodwin*⁴⁸ the court held that “used in navigation” is confined to a ‘vessel’ making an ordered movement over the water from one place to another. However, in *Perks v Clark*⁴⁹ the court differed from Sheen J in respect of the concept of “transporting persons or property”, and held it was not necessary for the purpose of defining ‘navigation’.⁵⁰

The definition of ‘vessel’ in the Salvage Convention 1989⁵¹ slightly modifies the approach provided by The Merchant Shipping Act 1995 in respect of ‘navigation’; it changes the word “used” for “capable”. Thus, salvage is not restricted to vessels “used in navigation” and it is extended to “any structure capable of navigation”. It is submitted this wording also includes “capable of being towed”.⁵²

Together with the definition of property as “property not permanently and intentionally attached to the shoreline”⁵³, the Salvage Convention 1989 considerably extends the subjects of salvage. Thus, reducing the need to bring mobile waterborne objects, such as FNPPs, within the definition of “ship” or “vessel” for salvage purposes.⁵⁴

⁴⁷ *Steedman v Scofield* [1992] 2 Lloyd’s Rep. 163 at 166.

⁴⁸ *R v Goodwin* [2006] 1 Lloyd’s Rep. 432

⁴⁹ *Perks v Clark* (n 31)

⁵⁰ Aleka Mandaraka Sheppard, *Modern Maritime Law. Volume 1, Jurisdiction and Risks* (3rd edn, Informa 2013), Ch. 1-7.2

⁵¹ International Convention on Salvage 1989, Art. 1 (b)3

⁵² *Brice* (n 14) para 3-09

⁵³ *Ibid* Art. 1C

⁵⁴ *Rose* (n 4) para 4-028

2.3 Excluded subjects of salvage

It is a general principle established in *The Gas Float Whifton No.2*⁵⁵ that static structures, even if they are capable of navigation, are not subjects of salvage. This principle is reflected in the Salvage Convention 1989 Article 1 (c), in which property is defined and excludes “property not permanently and intentionally attached to the shoreline.”

However, besides this general principle, Salvage Convention 1989 Article 3 provides with a specific treatment in respect of platforms and drilling units.

2.3.1 Platforms and drilling units

Salvage Convention 1989 Article 3 provides:

“This Convention shall not apply to fixed or floating platforms or to mobile offshore drilling units when such platforms or units are on location engaged in the exploration, exploitation or production of sea-bed mineral resources.”

Three elements can be pointed out from the wording of the article for the exclusion to operate;

First, the structure must be considered a “fixed or floating platform” or a “mobile offshore drilling unit”. Thus, it will be a question of fact whether the structure is properly described as a ‘platform’. ⁵⁶ The Salvage Convention 1989 does not provide a definition of ‘platform’. In this context ‘platform’ would refer to a structure that rests or is attached to the seabed and used for oil extraction, however for the purpose of the exclusion it would not matter whether it is “fixed” or “floating” or even “capable of navigation”. ⁵⁷

Secondly, the structure must be “on location.” ⁵⁸ Thus, the structure will be considered differently for salvage purposes when it is being moved from one place to its destination location, as in *Maridive VII v Key Singapore*⁵⁹ where no

⁵⁵ *The Gas Float Whifton No.2* (n 5); See 2.1.1 above

⁵⁶ *Brice* (n 14) para 3-14

⁵⁷ *ibid*

⁵⁸ *Rose* (n 4) para 4-172

⁵⁹ *Maridive VII, Maridive XIII, Maridive 85 and Maridive 94, Owners, Masters and Crews of the tugs v Key Singapore, Owners and Demise Charterers of the oil rig (Maridive VII v Key Singapore)* [2005] 1 Lloyd’s Rep. 91

reference is made to the fact that a ‘jackup rig’ towed from one field to another cannot be subject of salvage.⁶⁰

Thirdly, the exclusion will apply while the structure is being employed to its specific purpose. The article refers precisely to “exploration, exploitation or production of sea-bed mineral resources” as the exclusion is thought to apply over oil rigs. Thus, if this exclusion is intended to be expanded to FNPPs; the production of energy, which is the specific purpose of a nuclear power plant, could be understood to fall within this criteria. Nevertheless, if the excluded activities can consist of other than drilling, it would be difficult to determine whether the structure in question is “engaged” in such activity or not.⁶¹

2.3.2 Reason behind the exclusion

The reason behind the exclusion of ‘fixed or floating platforms’ and ‘mobile offshore drilling units’ from the Salvage Convention 1989 is a specific request of the oil industry.⁶² The representatives of the ‘International Association of Drilling Contractors’ had serious concerns about a situation where a casual salvor, who is presumed to have more experience with ships rather than oil rigs and no knowledge of the complex operation of such structures, attempts to render salvage services to the structures in question.

Oil and Gas platforms usually have detailed safety plans, which could be interfered by a salvor who is not specifically prepared for the situation. That it is why it is thought that it could do more damage than good if volunteer salvors find themselves involved in a salvage operation of such platforms.⁶³

For example, the ‘American Petroleum Institute’ does count with more than 500 standards that apply to many segments of the industry; from drill bits to environmental protection, and recommended practice.⁶⁴ In addition, from other

⁶⁰ See 3.3 below

⁶¹ Nicholas J J Gaskell, *'The 1989 Salvage Convention and the Lloyd's Open Form (LOF) Salvage Agreement 1990'* (1991) 16 Tul Mar LJ 1

⁶² Shaw (n 37)

⁶³ David Joseph Attard, *The IMLI Manual on International Maritime Law Volume II: Shipping Law*, Ch. 18.4.3

⁶⁴ Masahiko Okubo, *A critical analysis of safety and marine environmental protection regulations for oil and gas development in the high seas* (2014) World Maritime University Dissertations, 467.

private societies such as the Norwegian ‘Det Norske Veritas GL’, we can find particular standards, specifications and recommended practices to apply. The “Environmental, health, and safety guidelines for offshore Oil and Gas development” from the ‘World Bank Group’, or the “NINA” safety statement from ‘Boskalis’, are just more examples of how the industry is concerned with the potential issues coming from these structures.

By contrast, specific international safety regulations or standards in respect of FNPPs do not exist up to date.⁶⁵ Nevertheless, a vast body of regulations in respect of carriage of nuclear material has to be taken into consideration⁶⁶, which include provisions in respect of the safety of the ship. In this regard, experts share the same view as the oil industry; decommissioning and final salvaging should be performed by specialized enterprises.⁶⁷

However, professor F.D Rose⁶⁸ finds the exclusion to be unnecessary, given the right of potential salvees to reject salvage services and the salvor’s inability to claim a salvage reward for officious intervention. It is to be noted that salvees have the option of contractual salvage, and may arrange salvage under LOF with a chosen contractor. In that case, provisions from the Salvage Convention 1989 will apply to the services despite the exclusion from Article 3.⁶⁹

⁶⁵ Alexandre Nikitin and Leonid Andreyev, *Floating Nuclear Power Plants* (2011) Bellona Report

⁶⁶ See 4.2.1 below

⁶⁷ Gorlinskii Y. E, Kut’kov Y. E, Lystsov V. N, Makarov V. I, Murzin N. V and Pavlov V. D, *Securing the radiological safety of people and the environment at all stages of the life cycle of floating nuclear heat-and-power plants* (2009) Russian Science Center Kurchatov Institute, Atomic Energy Vol. 107, No.2

⁶⁸ Rose (n 4) para 4-172

⁶⁹ ibid para 4-018; Shaw (n 37); Gaskell (n 61)

Chapter 3 FLOWING NUCLEAR POWER PLANTS UNDER TOWAGE

In the previous chapter considerations were made over salvage rendered to a Floating Nuclear Plant as a single structure, in particular if such structure could be itself considered a proper subject of salvage.

However, the nature of a FNPP requires that these structures must be towed in order to move from one place to another, as they do not have own means of propulsion. This requisite gives rise to a new factual scenario were a convoy of a FNPP and a tug might find a situation where salvage is required, thus presenting different legal issues from the above discussed.

The aim of this chapter is to determine whether a FNPP under towage can be subject of a salvage operation; under what circumstances a towage operation turns into salvage, the status of each part under such operation and what could be the main issues resulting from this particular operation.

3.1 Preliminary considerations

Before addressing the issue of FNPPs being subject of salvage under a towage operation, it would be of great importance to settle the basis of the connexion between salvage and towage, and how the existing legal framework attaches this issue.

3.1.2 Salvage distinguished from towage

Prior to the appearance of the steam-powered tug, towage under the view of a commercial service provided by a vessel specifically dedicated to such purpose was unknown. Situations of towage of one vessel by another were usually seen under the context of salvage assistance.⁷⁰

In the early part of the nineteenth century with the development of the steam tug, towage services started to be rendered for a variety of circumstances, including long ocean tows. A dispute arose as to discern whether a service was towage or salvage; tug owners would often face unexpected towage conditions, which made their agreement less advantageous, and argued that the service rendered fell

⁷⁰ Simon Rainey, *Law of tug and tow and offshore contracts* (4th edn, Informa 2017) para 8.1

outside the agreed contract, thus entitling them to seek additional salvage remuneration.⁷¹

In *The Reward*⁷², a case which involved such dispute, the Admiralty Judge said:

"I apprehend that mere towage service is confined to vessels that have received no injury or damage, and that mere towage is payable in those cases only where the vessel receiving the service is in the same condition she would ordinarily be in without having encountered any danger or accident."

A simple definition of towage in this respect was provided by Dr Lushington in *The Princess Alice*⁷³:

"A towage may be described as the employment of one vessel to expedite the voyage of another when nothing more is required than the acceleration of her progress."

The essential distinction between towage and salvage resides under the requirement of an element of danger for salvage. Although some other can be pointed out; the requirement of success in order to claim salvage reward, the voluntariness ingredient that salvage services usually contain and the different kind of lien that each service give rise to.⁷⁴

However, this dispute rarely constitutes a problem nowadays. Both salvage and towage services are normally rendered under specific contracts, which make clear this distinction. Some towage contracts contain an express exclusion of any right to claim for salvage, these clauses are common when the tow is already in danger at the time of contracting and the towage operation is usually known as "engaged services". More usual modern contracts, such as 'Towcon' or 'Towhire'⁷⁵, include this exclusion in respect of salvage, but following the Common Law position in this matter.⁷⁶ On the other hand, salvage is normally

⁷¹ *ibid*

⁷² *The reward* [1841] 1 Wm Rob 174

⁷³ *The princess Alice* [1849] 3 Wm Rob 138

⁷⁴ *Attard* (n 63) Ch. 18.2

⁷⁵ 'Towcon' Clause 21; 'Towhire' Clause 19

⁷⁶ See 3.2.1 below

carried out under LOF contracts, which left no doubt about the duties and responsibilities from each part.

3.1.2 A proper subject of salvage?

As aforementioned, salvage remuneration can only arise under services rendered to a proper subject of salvage. This may lead to potential problems at the time of considering towed property. In this respect, Lord Herschell in *The Gas Float Whitton No.2*⁷⁷ proposed that salvage considerations over ‘cargo’, which is a recognised subject of salvage, might be extended to goods under towage:

“Where goods are being towed from place to place, although they are not, strictly speaking, cargo, they yet partake of its character and are closely analogous to it. They are being transported from place to place by a vessel. Their transport is a maritime adventure of precisely the same nature as the carriage of goods in the body of a ship. All the grounds of expediency in which the law of salvage is said to have had its origin would seem to apply to the one case as much as to the other. It may be, then, that in salvage law a broad and liberal construction should be extended to the word ‘cargo’ so as to embrace goods in course of being transported by a vessel though not inside it.”

However, under the existing statute law many of these potential problems no longer present a great concern. The broad definitions provided by the Salvage Convention 1989 Article 1, in particular the understanding of property of Article 1 (c) as “any property not permanently and intentionally attached to the shoreline”, are considered wide enough to cover almost all water-borne objects.⁷⁸ Thus, as a general principle the convention will be applicable to property under towage and it will not be necessary to descend to particulars as to whether the property falls within one of the traditional subjects of salvage.⁷⁹

⁷⁷ *The Gas Float Whitton No.2* (n 5) at 344-345.

⁷⁸ *Rainey* (n 70) para 8.13

⁷⁹ *Rose* (n 4) para 4-051

3.2 Salvage of towed property

There are some general considerations made over salvage of towed property that settle the main issues arising from an operation of this kind and how courts have addressed such issues. Thus, these considerations will be applicable to every situation in respect of towed property being salved, including a FNPP, therefore of interest for our subject of study.

3.2.1 Services rendered under existing contracts

As mentioned above, one of the main issues in respect of the connexion between salvage and towage is to identify the precise moment at which a towage service transforms into a salvage operation. It is not uncommon that a towage operation comes across different conditions from what it was expected at the time of contracting, thus if the tug is required to perform different services from what was expected they will want to be remunerated in accordance.

From the first considerations over this issue in towage situations, the Admiralty Court has sought to provide a balance between setting out extra-contractual remuneration to the tug and protect the tow from attempts of the tug from escaping from its contractual obligations.⁸⁰

The view presented by *The Minnehaha*⁸¹ settles the basis of this question, as it is considered to be the leading case in this matter and the one to provide an efficient test for conversion of towage into salvage. The case involves a situation where a contract of towage was deemed to be concluded under extreme weather conditions, specifically due to ebb-tide and the breaking of the tug hawser.

The relevance of the case rests in the test provided in Privy Council by Lord Kingsdown⁸², who concluded:

“When a steam-boat engages to tow a vessel for a certain remuneration from one point to another, she does not warrant that she will be able to do so and will do so under all circumstances and at all hazards; but she does engage that she will use her best endeavours for that purpose... She may

⁸⁰ Rainey (n 70) para 8.24

⁸¹ Ward & Ors v McCorkhill & Ors (*The Minnehaha*) [1861] 15 Moo PC 133

⁸² ibid at 152-154

*be prevented from fulfilling her contract by a *vis major*, by accidents which were not contemplated, and which may render the fulfilment of her contract impossible, and in such case, by the general rule of law, she is relieved from her obligations.*

But she does not become relieved from her obligations because unforeseen difficulties occur in the completion of her task... If in the discharge of this task, the ship in tow is placed in danger, and the towing-vessel incurs risks and performs duties which were not within the scope of her original engagement, she is entitled to additional remuneration for additional services if the ship be saved, and may claim as a salvor, instead of being restricted to the sum stipulated to be paid for mere towage.

The tug is relieved from the performance of her contract by the impossibility of performing it, but if the performance of it be possible, and in the course of it in the ship in her charge is exposed, by unavoidable accident, to dangers which require from the tug services of a different class and bearing a higher rate of payment, it is held to be implied in the contract that she shall be paid at such higher rate.”

From this judgement we can establish what it is called a “two-fold”⁸³ requirement for which a tug owner under a towage contract is able to claim for salvage. The requirements as expressed by Lord Kingsdown are;

First, the existence of “unforeseen difficulties”, i.e. conditions which could not be expected at the time of contracting, in the completion of the towage service which placed the tow in danger. The danger is the common element for every salvage operation⁸⁴, becoming the essential requirement for the conversion. Thus, “unforeseen difficulties” will not be enough for the conversion, it is required for these unexpected difficulties to put the tow under danger in order to claim salvage.

The misconduct from the tug constitutes a relevant point at the time of considering the placement of the tow under danger. Lord Kingsdown⁸⁵ had the view that if

⁸³ Rainey (n 70) para 8.26

⁸⁴ Ibid para 8.37; Rose (n 4) para 1-001

⁸⁵ The Minnehaha (n 81) at p.155

the danger is attributable to the fault of the tug by either wilful misconduct or negligence, or even by a mere contribution to the danger, “she can never be permitted to profit by her own wrong or default.” However, this particular decision was reversed by the House of Lords in *The Kafiristan*⁸⁶ in which it was held that a tug in such circumstances should not be deprived of the opportunity to claim for salvage.

Secondly, incurring in risks and performing duties which are “not within the scope of the original engagement”. It must be determined whether the services provided actually fell outside the nature of those contracted, the contractual towage services have to be defined with caution and compared with those in fact provided.⁸⁷ The service rendered must be one “of a different class and bearing a higher rate of payment”. However, there is no need of that element of danger in respect of the tug, as it was held in *The Pericles*⁸⁸.

This “two-fold” requirement laid down in *The Minnehaha* has been followed in several later cases. One that can be considered of special interest for our subject of study is *The North Goodwin No. 16*⁸⁹. This case involves a situation where a ‘light vessel’ was being towed on to a berth under bad weather conditions. The hawser suddenly broke during the operation and the light vessel got adrift. One of the tugs went for assistance and managed to get a line aboard the light vessel, thus being able to tow her to an anchorage. Tug demanded a salvage reward, however the Court rejected the claim following the test from *The Minnehaha*. It was held that despite of the “unforeseen circumstances” the lightship was never considered to be in danger.

Situations from *The North Goodwin No. 16* and *The Gas Float Whitton No.2*⁹⁰ can be compared, as they both involve a salvage claim for a ‘light vessel’. In the latter, Court rejected salvage under the basis that a ‘light vessel’ was not a proper subject of salvage and provided with the general exclusion of static structures. In the former, even though the structure was the same, the considerations over a

⁸⁶ *Beaverford v The Kafiristan (The Kafiristan)* [1938] AC 136

⁸⁷ *Rainey* (n 70) para 8.57

⁸⁸ *The Pericles* [1863] Br & L 80

⁸⁹ *The North Goodwin No. 16* [1980] 1 Lloyd’s Rep 71

⁹⁰ *The Gas Float Whitton No.2* (n 5); See 2.1.1 above

‘light vessel’ being a proper subject of salvage were not relevant as the structure in question was under towage. Salvage was rejected under *The Minnehaha* basis and not under *The Gas Float Whitton No.2*, thus if the situation in *The North Goodwin No. 16* hypothetically happened to pass the test; a structure which has been previously held to be an excluded subject of salvage would render a salvage reward under towage.

It is to be noted that the Common Law approach to this issue has been reflected in the actual Salvage Convention 1989, which Article 17 in respect of “Services rendered under existing contracts” states:

“No payment is due under the provisions of this Convention unless the services rendered exceed what can be reasonably considered as due performance of a contract entered into before the danger arose.”

It is submitted that the previous Common Law principles in respect of towage and salvage cases before the enactment of this Salvage Convention 1989 Article 17 remain unaffected. It is considered just a mere codification of the Admiralty Court approach, in particular the decision in *The Minnehaha*.⁹¹

3.2.2 Contribution of Tug and Tow

Where both Tug and Tow are considered as a unit subject of the salvage operation, the general principles of salvage will apply.⁹² However, whether or not considered separately, a problem might arise at the time of identifying which vessels are to contribute to reward the salvage service received.⁹³

In relation to this question, we can find this matter has been discussed on the grounds of general average and addressed by the 1994 York-Antwerp Rules⁹⁴. However, the question of “common maritime adventure” as provided by Rule A of the York-Antwerp Rules has never been addressed by the English courts in the context of towage and general average⁹⁵, but it has been considered by few

⁹¹ *Rainey* (n 70) para 8.36

⁹² *ibid* para 8.124

⁹³ *Rose* (n 4) para 4-048

⁹⁴ York-Antwerp Rules 1994, Clause A and C

⁹⁵ *Rainey* (n 70) para 13.27

American Cases; *The JP Donaldson*⁹⁶ and *SC Loveland Co v USA*⁹⁷. In both cases it was laid down that tug, tow and the cargo in a tow should be considered united in a common adventure so as to require all to contribute for a general average act which suppose a common benefit.⁹⁸ Nevertheless, neither of these cases are binding on English courts and are considered as a rather doubtful authority⁹⁹; It is submitted that *SC Loveland* is wrongly decided, as it is though there was no apparent common danger to justify general average.¹⁰⁰

Coming back to salvage, we can find no rules or principles concerning how tug and tow should be treated in respect of a salvage operation, far from any basis to treat them as a unit in all cases. The issue of contribution to the salvage received is dealt by identifying which part of the towage convoy is in danger and the extent of the salvage services rendered to such specific part.

S. Rainey Q.C.¹⁰¹ in respect of this issue present the following possible situations:

- i) When the towed property is owned by the tug owner, and during the course of events both parts find themselves under the same danger; the tug owner contributes for the salved value of both parts. Illustrated in *The Rilland*¹⁰² where the tug owner, who owned the barge being towed, contributed for the service rendered to both parts of the convoy.
- ii) If it happens that each part finds a different danger and just one part of the convoy needs to be salved, for example when the tow-line breaks and just the tow is under danger; the tug owner is to contribute for the salvage operation as the owner of the salved property.
- iii) When the towed property is owned by a third party, and during the course of events both parts find themselves under the same danger; both owners

⁹⁶ *The J P. Donaldson* [1897] 167 US 5991

⁹⁷ *Loveland Co Inc v United States* [1963] AMC 260

⁹⁸ *Rose* (n 4) para 4-049

⁹⁹ Richard Cornah, *Lowndes and Rudolf: The Law of General Average and the York-Antwerp Rules* (15th edn, Sweet & Maxwell 2018) para B.02

¹⁰⁰ *Rose* (n 4) para 4-049

¹⁰¹ *Rainey* (n 70) para 8.12

¹⁰² *The Rilland* [1979] 1 Lloyd's Rep 455

separately contribute for the salved value in respect of their own property measured separately.

iv) If it happens that each part finds a different danger and just one part of the convoy needs to be salved, just like exemplified before; both owners are to contribute in respect of the different services provided and measured separately.

Thus, when identifying which vessel is to contribute for the salvage service, it is “imperative to discern” whether the tug and tow are both under a common danger, whether both benefit from the salvage service and whether if they needed the same or different salvage services.¹⁰³

3.3 Floating Nuclear Power Plants under towage

Whether considering FNPPs a subject of salvage when such platforms are being towed from one place to another, a simple analogy could be made in respect of other floating platforms under the same circumstances. Thus, same considerations and Case Law over such structures could be extended to FNPPs if these ever find to be the subject of a salvage operation while they are being towed.

It is to be noted that when considering salvage over either fixed or floating platforms, the Salvage Convention 1989 provides with an exclusion from salvage for these structures when they are “on location engaged in the exploration, exploitation or production of sea-bed mineral resources.”¹⁰⁴ However, this exclusion will not have any effect over the structures mentioned when they are being towed to destination.

In one hand because, as it is been noted above, structures under towage will be considered to fall within the definition of ‘property’ provided by Salvage Convention 1989 Article 1 (c), which is considered wide enough to encompass property under towage, and therefore there is no need to descend to particulars to test whether the craft in question falls under the definitions provided by Salvage Convention 1989 Article 1(b). On the other, because attending the wording from the exclusion, it provides that the exclusion applies to such structures when they

¹⁰³ *Rose* (n 4) para 4.047

¹⁰⁴ International Convention on Salvage 1989, Art. 3; See 2.3 above

are “on location engaged”, thus once the platform is on location at its destination location and operating for the commitment of its purpose. No considerations are made in respect of any exclusion of such structures when they are being transported to its destination location.

It is possible to observe how courts have followed this line of interpretation in recent cases. An example, that could be used as reference at the time of considering salvage of FNPP under towage, could be the case *Maridive VII v Key Singapore*¹⁰⁵ which is discussed below.

It should also be noted the fact that for nuclear vessels, the request of a place of safety is contingent on special permissions.¹⁰⁶ Thus, as has happened with other nuclear vessels before, such as the *Servmorupt* carrying the same exact nuclear reactors as the FNPP *Akademik Lomonosov*, the structure might encounter several refusals of port of refuge due to the potential nuclear threat.

Therefore, if during the towage of a FNPP a distress situation develops and for salvage purposes it is needed to request permission to enter a port, in which because of the nature of the structure the entrance is refused, the salvage operation might face significant problems. Thus, a salvage operation doomed to be unsuccessful from an early start, that could discourage salvors to render the services.

3.3.1 *Maridive VII v Key Singapore*

This case involves a situation where a salvage reward is requested for an operation rendered to a ‘Jackup Rig’ while she was being moved from one field to another. The facts of the case were as follows; The initial operation concerned rig being towed for a distance of 38 miles and was expected to take 17 hours to conclude starting by the 30th of November. During the operation, the weather conditions deteriorated, under this circumstance the rig was unable to pin down on location and the tugs were instructed to tow the rig to a “stand by position”. After 3 days facing bad weather conditions, the rig still could not reach a stable safe place. The hawser from one of the tugs parted, in the light of this event the

¹⁰⁵ *Maridive VII v Key Singapore* (n 59)

¹⁰⁶ *Bellona Report* (n 65)

tow owners engaged new stronger tugs for continuing the operation. Before the arrival of such tugs, another hawser parted; either tow wires were possible to fast again. During the operation a total of 4 hawsers broke, 2 evacuations of the crew from the rig were needed and took another 7 days to bring the rig to a safe location. Concluding the salvage operation by the 10th of December.

The original arbitrator held that the rig came into danger to an extent to justify a claim of salvage from the moment that the second hawser parted, thus, the services rendered after that time constituted salvage service for which the Claimants were *prima-facie* entitled to an award under Salvage Convention 1989 Article 13.¹⁰⁷

However, the Respondent's primary contention was that the Claimants created the situation of danger and thus made the services necessary. Pleaded the application of the Salvage Convention 1989 Article 18¹⁰⁸ to deprive Claimants of any reward. The arbitrator refused this argument and found that the need for salvage or their degree of difficulty had risen through the fault of both parties, thus it was necessary to assess a relative contribution of the parties to the reward.¹⁰⁹

In further instances, the case developed in a dispute over contribution and apportionment of liability. Thus, the main issue of law being discussed was "Apportionment of Liability as guided by two principles of law: i) the responsibilities between tugs and tow, and ii) the principles and fairness of justice."¹¹⁰

No considerations were made about whether the 'Jackup Rig' was a proper subject of salvage or any salvage exclusion to apply, besides Salvage Convention 1989 Article 18 provisions. Thus, it is possible to conclude that a FNPP will be regarded as a subject of salvage while it is being towed to its destination, and the issues of law that could reasonably be expected from a

¹⁰⁷ *ibid* at 19

¹⁰⁸ "A salvor may be deprived of the whole or part of the payment due under this Convention to the extent that the salvage operations have become necessary or more difficult because of fault or neglect on his part..."

¹⁰⁹ *Maridive VII v Key Singapore* (n 59) at 22

¹¹⁰ *ibid* at 27 (c)

salvage operation in such circumstances are in respect of contribution and apportionment of liability as presented above.¹¹¹

¹¹¹ See 3.2 above

Chapter 4 NUCLEAR CARGOES AND ENVIRONMENTAL SALVAGE

When thinking of Floating Nuclear Power Plants, one of the first things that might come to our mind is the nature of the elements that integrate such floating structure. Thus, a floating facility carrying two KLT-40 C nuclear fission reactors, low-enriched uranium used as fuel for the reactors and the radioactive waste produced from the normal use of the reactors may present big concerns about the treatment of such property and its safety.

The aim of this chapter is to determine whether the cargo concerned will be considered subject to salvage, the regulations in respect of the particular nature of nuclear cargo and the expected threats that a FNPP will give rise to. Thus, analysing the particularities of salvage when there is an existing environmental threat.

4.1 Property ancillary to Floating Nuclear Power Plants

The qualification of the property as subject to salvage, discerning between all the components and elements involving the operation of a FNPP, will be crucial when considering salvage in respect of such structure.

J. Reeder Q.C.¹¹² finds three particular questions that may arise when considering salvage of property ancillary to vessels; whether the vessel and property are to be treated as one entity, whether to make a separate assessment in regard to the danger to which each property is exposed and whether salved values are to be assessed in the conventional manner or separately.

4.1.1 Apparel

As it is been presented above, the ship and her apparel are expressly included within the proper subjects of salvage identified in *The Gas Float Whitton No.2*¹¹³ as recognised at Common Law. However, statutory provisions in respect of salvage do not specifically mention the term “apparel”. For this matter, we can attend to the wide interpretation of the term ‘property’ provided by Salvage Convention 1989 Article 1, which can gather what is understood for “apparel”.

¹¹² Brice (n 14) para 3-29

¹¹³ *The Gas Float Whitton No.2* (n 5)

Thus, becoming a subject of salvage under the light of the Salvage Convention 1989 as acknowledge by Common Law.

Under the view of professor F.D. Rose¹¹⁴, “apparel” can be considered as an elastic term. It does not appear to have been the subject of a definition, either by statute or by court. This is because the property that might appear to fall within the understanding of apparel are normally treated under some other description, principally as a part of the ship or vessel. This presents an established practice of treating in conjunction all the property owned by the shipowner, for the purpose of distinguishing it from other property not owned by the shipowner.

Treating as one entity the property owned by the shipowner a common practice when exercising the admiralty jurisdiction in rem. In the case *The Silia*¹¹⁵ a vessel was sold with everything on board belonging to the owners because of a writ in rem issued to the vessel. The sale included the unused fuel oil and lubricating oil, for which the plaintiffs argued that such property was not part of the ship and therefore not part of the fund available. Sheen J. refused the argument of the plaintiffs and held that the sale of the oil were part of the res and available to creditors in rem.¹¹⁶ He concluded:¹¹⁷

“I have no doubt that in the context of an action in rem the word ‘ship’ includes all property aboard the ship other than that which is owned by someone other than the owner of the ship.”

Although, certain objects are excluded from salvage under the authority *Brown v Stapyleton*¹¹⁸ which provides that only ‘merces’ and cargo on board for the purpose of commerce might be regarded as subject to a general average contribution.¹¹⁹ However, in modern times, ships carry sophisticated and expensive equipment and it is unlikely that the court limits the liability to pay a salvage reward to property on board with the purpose of commerce. It is

¹¹⁴ Rose (n 4) para 4-30

¹¹⁵ *The Silia* [1981] 2 Lloyd’s Rep. 534

¹¹⁶ Rose (n 4) para 4-032

¹¹⁷ *The Silia* (n 115) at 537

¹¹⁸ *Brown v The Honourable Granvill Anson Chetwynd Stapyleton and Others (Brown v Stapyleton)* [1827] 4 Bing. 119

¹¹⁹ Relating salvage with general average as seen in 3.2.2

submitted that radar and radio equipment are a proper subject of salvage, which value will be included in the overall salved value.¹²⁰

Thus, when considering the carriage of a nuclear fission reactor, if it is not possible to describe it as cargo, it could be regarded as part of the ship or its apparel. It is property owned by the shipowner, fixed to the structure of the craft as its carriage and functioning is the main purpose of the whole structure, and it is also exposed to risk with a value large enough to be significant.

4.1.2 Cargo

In salvage, after the actual ship or vessel, cargo is the second most important item to be qualified as property subject of salvage.¹²¹ It is expressly recognised as so in Common Law under the listed subjects of salvage in *The Gas Float Whitton No.2*¹²² and again implied in statutory law under the broad concept of 'property' provided by Salvage Convention 1989 Article 1.

Cargo encompass all the goods or merchandise carried on the salved vessel, regardless of who its owner is.¹²³ There is no need of freight to be paid for its carriage nor a Bill of Lading or any other contractual document.¹²⁴ Cargo constitutes a salved value on its own, it is independent from the considerations over the vessel.

If property is being carried, then it would be qualified as cargo. Thus, a proper subject of salvage even if its normal identity is one that it would not.¹²⁵ Consequently, objects typically excluded from salvage as buoys¹²⁶ will be subject of salvage when they are being carried aboard as they will be treated as cargo. Moreover, it was held in *Sembawang Salvage Pte Ltd v Shell Todd Oil Services Ltd*¹²⁷ that a part of the structure of a drilling platform, which is property expressly excluded of salvage¹²⁸, remained subject to a maritime lien even after its

¹²⁰ *Rose* (n 4) para 4-037

¹²¹ *ibid* para 4-041

¹²² *The Gas Float Whitton No.2* (n 5)

¹²³ *Rose* (n 4) para 4-042

¹²⁴ *ibid*

¹²⁵ *ibid* para 4-04

¹²⁶ *The Gas Float Whitton No.2* (n 5); *The Upcerne* (n 43)

¹²⁷ *Sembawang Salvage Pte Ltd v Shell Todd Oil Services Ltd* [1993] 1 N.Z.L.R. 97

¹²⁸ International Convention on Salvage 1989, Art. 3

attachment to the sea-bed from a salvage operation rendered while it was being carried on a barge.

Thus, it is left clear that the rest of the cargo concerning the nuclear fission reactor, i.e. low-enriched uranium and the stored radioactive waste, will constitute a subject of salvage which value will contribute to a reward. However, for our subject of study, the considerations over State-Owned cargoes from the Salvage Convention 1989 should be pointed out, as its Article 25 provides with the following exclusion:

“Unless the State owner consents, no provision of this Convention shall be used as a basis for the seizure, arrest or detention by any legal process of, nor for any proceedings in rem against, non-commercial cargoes owned by a State and entitled, at the time of the salvage operations, to sovereign immunity under generally recognized principles of international law.”

Nuclear activities and materials are subject to strict government control and regulation.¹²⁹ Thus, when considering salvage of cargo of this kind, we will probably find situations of property owned by a State. Up to date, the only two FNPPs ever built; the *Sturgis* and the *Akademik Lomonosov*, are owned by the United States Army and the Russian State Atomic Energy Corporation Rosatom respectively. A fact that just increments the complexity of a salvage operation over such structures.

4.2 Dangerous, Hazardous and Harmful Cargoes

The increased frequency in the carriage of dangerous goods by sea, with an actual estimation of more than 50% of the cargoes being regarded as dangerous, hazardous or harmful¹³⁰, has led to the progressive development of international regulations and standards to promote maritime safety.¹³¹

Most of these regulations involve the carriage of goods by sea under a commerce perspective, which fall out of the scope of our subject of study. However, the same legal difficulties may be anticipated if pollution is caused by chemical

¹²⁹ See 4.2 below

¹³⁰ Meltem Deniz Güner-Özbek, *The Carriage of Dangerous Goods by Sea* (Springer 2008) Ch.2 A

¹³¹ ibid Ch1. A

spillages from floating production storage and offloading units, mobile offshore units and any other offshore craft.¹³² Thus, affecting to FNPPs and concerning salvage in respect of such substances and the environment.

4.2.1 Radioactive Materials Regulation

The Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997 is the main legal body in respect of the carriage of dangerous goods in the United Kingdom, both for ships and ports. It contains provisions in respect of maintenance of equipment, health and safety, stowage, segregation, handling and transport of such goods. These provisions do not include specific instructions, but require compliance with international codes or recommendations¹³³, as the ones detailed below relevant to our subject of study, thus providing such rules with the force of law in the UK. Nevertheless, FNPPs could be placed or moved through international waters, these regulations must be taken into account if it is pretended to develop international safety standards for the use of nuclear energy.¹³⁴

The main authority, at a global stage, in respect of Nuclear Regulations is the United Nations International Atomic Energy Agency (IAEA). It consists of an intergovernmental forum for scientific and technical cooperation in respect of nuclear technology. The IAEA has particularly provided with the Regulations for the Safe Transport of Radioactive Materials, which consist of advisory regulations in the field of safe transport of radioactive materials.¹³⁵ The provisions from the IAEA in this field will be of high relevance for the regulation provided from the different conventions.

The International Maritime Dangerous Goods Code (IMDG Code) is created to complement both International Convention for the Safety of Life Sea at Sea (SOLAS) and International Convention for the Prevention of Pollution from Ships (MARPOL). It contains mandatory provisions in respect of packing, traffic and stowage of dangerous goods. The IMDG Code provides with an specific

¹³² Richard Shaw, *The FPSO – is it a ship? The proposed CMI Offshore Mobile Craft Convention – an up-date* (2000) Year Book of the Australian Mineral and Petroleum Law Association

¹³³ Güner-Özbek (n 130) Ch.1 G

¹³⁴ Gorlinskii (n 67)

¹³⁵ Güner-Özbek (n 130) Ch. 1 C

classification of goods, which is used by many of the other regulations. In relevance to our subject of study, we can find; i) class (7) – Radioactive Materials in which enriched uranium, radioactive ores and equipment are included.¹³⁶ The provisions made in respect of class (7) are based on IAEA Regulations for the Safe Transport of Radioactive Materials, thus giving force of law to advisory regulations, and consist of guidance in respect of the handling and transport of radioactive materials, both in port and on ships.¹³⁷ And ii) section (10) – Marine Pollutants, which are not a particular class as they encompass many of substances from other classes, including class (7). These substances are subject to provisions from the MARPOL, which is the main convention in respect of prevention of pollution of the marine environment by ships through operational and accidental causes.¹³⁸

The International Maritime Organization has always tried to provide a consistent and uniform international regulation in respect of the carriage of dangerous goods. Thus, creating the Convention for the Safety of Life Sea at Sea, from which it would be of relevance to our subject of study its part D. It provides of special requirements for the carriage of nuclear fuel, plutonium and radioactive waste and requires ships to comply with the International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Waste on Board Ships (INF Code). The INF Code establishes higher standards from conventional ships in respect of the design and operation of ships carrying such materials.¹³⁹

The previous provisions are principally focused on preventing the “danger”, without much appreciations being made in respect of the “danger” affecting third parties.¹⁴⁰ Thus, a new instrument dealing with liability for damage caused in connexion with hazardous and noxious substances was created; The International Convention on Liability and Compensation for Damage in

¹³⁶ Little Pro, *Class 7 Dangerous Goods Radioactive Material* (Chemsafetypro, 7 Jan 2016)

<https://www.chemsafetypro.com/Topics/TDG/Class_7_Dangerous_Goods.html> accessed 10 August 2020

¹³⁷ Güner-Özbek (n 130) Ch. 2 E

¹³⁸ ibid Ch. 1 B

¹³⁹ ibid Ch. 1 C

¹⁴⁰ ibid Ch. 1 E

Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS Convention). The regime established by the HNS Convention is based on the previous existing regime for oil pollution.¹⁴¹ Moreover, radioactive materials are explicitly excluded from the convention.¹⁴² This exclusion was made in base on the already existing regulations covering liability for such materials; Paris Convention on Third Party Liability in the Field of Nuclear Energy 1960, Vienna Convention on Civil Liability for Nuclear Damage 1963 and the Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material 1971.

Nevertheless, the exclusion of radioactive materials from the HNS Convention seems controversial. Under the view of Professor P. Wetterstein¹⁴³, a liability and compensation framework for the carriage of nuclear materials by sea is lacking. If the convention aims to achieve a broad coverage of hazardous transports, they should include all radioactive materials.

At the present time, provisions from Securing the Radiological Safety during the Design, Construction, Operation, and Decommissioning of Low-Capacity Nuclear Heat-and-Power Plants Based on a Floating Power-Generating Unit (SP-ATES-2003) Sanitary Regulations created by the Russian Ministry of Health, are the only regulations concerning the radiological safety and environmental protection for a FNPP in particular.¹⁴⁴

4.2.2 Floating Nuclear Power Plants particular threats

It does not exist a perfectly safe nuclear power plants in the world, a FNPP will not be an exception.

The Bellona Foundation, an international environmental non-governmental organization dedicated to environmental issues in the Arctic region, released a

¹⁴¹ The International Convention on Civil Liability for Oil Pollution Damage 1992; the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage 1992

¹⁴² International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, Art. 4.3.2

¹⁴³ Peter Wetterstein, *Carriage of Hazardous Cargoes by Sea - The HNS Convention* (1997) 26 Ga J Int'l & Comp L 595

¹⁴⁴ Gorlinskii (n 67)

report¹⁴⁵ concerning the nature and risk of the Rosatom FNPP Akademik Lomonosov in particular.

Firstly, from the operation of the KLT-40C reactor, they have considered some situations that might lead to potential risks and emergency situations. Considering the technical management of the reactor, unexpected nuclear reactions and overheat, all three during; normal or accident situations, core refuelling and forced or natural shutdowns.¹⁴⁶

Secondly, the radiation danger on human health and the environment. For which the main source of radiation from a FNPP will be the nuclear fuel, in particular the stored used fuel and the complex refuelling operations. Being the latter one of the main concerns, as most of the nuclear accidents have been known to occur during this process.¹⁴⁷ In respect of the storage of used fuel, it is submitted that stow large amounts of nuclear and radioactive material during the expected 12 years of operation just increases the risks in case of an accident.¹⁴⁸

In this respect, all the safety considerations made so far focus on human population and left behind the environmental issues.¹⁴⁹ The Russian Ministry of Health provisions establish that if humans are protected, then radiation does not suppose danger to environment and marine life.¹⁵⁰

Besides the potential nuclear and radiation danger above presented. The fact that we are dealing with a floating facility, just adds to these hazards the risks and perils that arise from the operation of a vessel. In particular this structure designed with; flat-bottom, low resistance to wind, and without her own means of propulsion and no steering capabilities. Thus, qualifying the structure as a potentially dangerous floating facility that have to always be accompanied by special towing vessels, even at berth.¹⁵¹.

¹⁴⁵ *Bellona Report* (n 65)

¹⁴⁶ *ibid*

¹⁴⁷ *ibid*

¹⁴⁸ *ibid*

¹⁴⁹ *Gorlinskii* (n 67)

¹⁵⁰ Radiation Safety Standards (NRB-99/2009)

¹⁵¹ *Bellona Report* (n 65)

The potential dangers are obvious, Greenpeace has even named it “Chernobyl on Ice”.¹⁵² In case this structure finds the need to be salved from a distress situation, involved salvors should understand the kind of hazards they are dealing with, and follow clear procedures. The environmental threat will be an important issue to consider when rendering salvage to such structures.

4.3 Environmental Salvage

Over the last decades, environmental consciousness has acquired an important weight in our society. Thus, affecting directly to legislation in several subjects and in particular has had a deep effect on the law of marine salvage.¹⁵³

Concern for environmental protection in the field of salvage has arisen due to environmental catastrophes, mostly involving oil tankers, such as the *Torrey Canyon* disaster or the *Amoco Cadiz* around the 1970's. Also, modern vessels and offshore structures have increased the potential threat to the environment, as they are capable of carrying larger cargos and develop more technical and dangerous activities. Thus, intervention by salvors may prevent the possible damage to the environment in an accident situation. However, the traditional law of salvage made no provision in respect of salvors being paid purely for environmental services.¹⁵⁴

The direct result is a vast majority of salvage operations being performed by professional salvors under specifically designed contracts; Lloyd's Open Form, and a shift towards environmental concerns in the Salvage Convention 1989, which now incorporates provisions designed to enhance salvage rewards in respect of environmental services.

These provisions are not limited to pollution by petroleum products¹⁵⁵, the environmental threat of a FNPP is obvious. Thus, prevention of environmental damage coming from nuclear materials is a crucial concern when considering salvage to such structures. In respect of the LOF, it has been used in several

¹⁵² Jan Haverkamp and Rashid Alimov, *32 years after Chernobyl, next up, a Chernobyl on ice?* (GreenPeace 26 April 2018) <<https://www.greenpeace.org/international/story/16149/32-years-on-chernobyl-on-ice/>> accessed 11 August 2020

¹⁵³ Edgar Gold, *Marine Salvage: Towards a New Regime* (1989) 20 J Mar L & Com 487

¹⁵⁴ Rose (n 4) para 4-165

¹⁵⁵ Shaw (n 37)

situations and its use allows an exception to the Salvage Convention 1989 Article 3 exclusion of oil drilling rigs.¹⁵⁶ Moreover, salvage to offshore structures under this contract has been rendered even before the creation of the Salvage Convention 1989, as with the rig *Orion* in 1978.¹⁵⁷

4.3.1 International Convention on Salvage 1989 & Lloyd's Open Form

The Lloyd's Open Form 1980 in a first attempt to cover environmental salvage, introduced the concepts of 'Safety net' and 'Enhanced Award'. These are considered twin concepts aiming to encourage salvors to prevent damage to the environment.

The Salvage Convention 1989 introduces these concepts, thus providing with statutory enforcement the needed encouragement for environmental salvage. The most relevant change is the creation of an exception to the traditional principle of salvage law of 'No cure – No Pay'¹⁵⁸. A principle which is found in the Salvage Convention 1989 Article 12 and establishes that in case a salvage service does not succeed in saving the ship or cargo, however salvors efforts and expenses, there is no entitlement to a salvage reward.

Salvage Convention 1989 Article 13 provides with a list factors, "with a view to encouraging salvage operations", to be considered while assessing the salvage reward and incorporates by Salvage Convention 1989 Article 13.1 (b):

"the skill and efforts of the salvors in preventing or minimising damage to the environment"

This way introduces the concept of 'Enhanced Award' as seen in the LOF 1980 and grants the environment as a recognised subject of salvage, which at first instance did not fall within one of the traditional subjects of salvage. Additionally, the Salvage Convention 1989 Article 1 (d) defines 'damage to the environment' as:

¹⁵⁶ See 2.3 above

¹⁵⁷ *Shaw* (n 37)

¹⁵⁸ *Gaskell* (n 61)

“substantial physical damage to human health or to marine life or resources in coastal or inland waters or areas adjacent thereto”

Thus, enabling to consider the threats from a FNPP, in respect of the nuclear reactor and the nuclear materials as seen above, to fall within a salvage definition of ‘damage to the environment’. Therefore, being able to assess the award in respect of the provision from Salvage Convention 1989 Article 13.1 (b).

However, provisions from Salvage Convention 1989 Article 13.1 are applicable in circumstances where there has been a successful salvage operation i.e. when the salvor in addition to saving property, also prevented oil pollution from the tanker¹⁵⁹. Thus, this principle is still connected to the Salvage Convention 1989 Article 12 and the ‘No cure – No Pay’ principle.

It is the Salvage Convention 1989 Article 14, which will bring the exception to such principle, and introduce the concept of ‘Safety Net’ as seen in the LOF 1980. Under the name “Special Compensation”, Article 14.1 provides:

“If the salvor has carried out salvage operations in respect of a vessel which by itself or its cargo threatened damage to the environment and has failed to earn a reward under article 13 at least equivalent to the special compensation assessable in accordance with this article, he shall be entitled to special compensation from the owner of that vessel equivalent to his expenses as herein defined.”

Thus, this provision entitles the salvor to claim for a ‘Special Compensation’ based on the expenses from an operation in respect of a vessel which threatened damage to the environment, regardless of whether the salvage operation was successful or not and even when the salvor fails to prevent or minimise that damage caused to the environment.¹⁶⁰

Nevertheless, if the salvor successfully prevents or minimise damage to the environment, the Salvage Convention 1989 Article 14.2 provides with a 30%

¹⁵⁹ Aleka Mandaraka Sheppard, *Modern Maritime Law and Risk Management* (2nd edn, Informa 2009) Ch. 13.4.1

¹⁶⁰ *ibid* Ch. 13.12.1

increase of such 'Special Compensation', and even allows the tribunal to increase it to a 100% of the expenses incurred by the salvor.

The assessment and definition provided for expenses has raised the main issue with this 'Special Compensation'. Salvage Convention 1989 Article 14.3 defines salvors expenses as:

"out-of-pocket expenses reasonably incurred by the salvor in the salvage operation and a fair rate for equipment and personnel actually and reasonably used in the salvage operation taking into consideration the criteria listed in Art 13(h), (i) and (j)"

In respect to the assessment, the 'Special Compensation' is subject to the reward acquired under the Salvage Convention 1989 Articles 13.1 and 14.4, and provides that:

"The total special compensation under this article shall be paid only if and to the extent that such compensation is greater than any reward recoverable by the salvor under article 13."

Thus, no element of profit is included in this concept as seen in salvage rewards. It consists only the reimbursement of expenses, remuneration for the salvage operation is left behind. Meaning, salvors are just entitled to their expenses, and in the event of failing to succeed in either salvage or prevention of environmental damage, no real profit is earned. Therefore, in some situations there will be no encouragement to proceed with the operation.

4.3.2 The Special Compensation of P&I Clause

These issues in respect of the 'Special Compensation', as drafted by the Salvage Convention 1989, can be observed in the judgement from 'The Nagasaki Spirit'¹⁶¹. The case involves an oil tanker that collided with another ship, causing a spill of 12,000 tons of oil. A salvage operation was rendered under LOF 1990, which contains the Salvage Convention 1989 Articles 13 and 14. The salvage operation, with the help of a number of tugs, succeeded and both vessel and cargo were saved.

¹⁶¹ *The Nagasaki Spirit* [1997] AC 455

The problems began at the time of assessing the reward, and the dispute was brought to the Court of Appeal. The main issue was how 'fair rate', as worded in Salvage Convention 1989 Article 14.3, had to be calculated for the tugs. It was held that it should include the costs of maintaining the salvage tugs in readiness, but 'fair rate' will not involve an element of profit. Profit shall be awarded under the increase of the 'Special Compensation' provided by Salvage Convention 1989 Article 14.2, in case the operation success to prevent damage to the environment. Their lordships also held that the expenses are not limited to those incurred in attempts to minimise pollution, but all expenses incurred in the operation.¹⁶²

The salvage industry was highly critical with this decision, as the costs of keeping the tugs and equipment in readiness, especially without demand, are very high. They argued that what their Lordships understood as 'fair rate' was inadequate, and without an element of profit the cost of the operation could not be compensated.

The direct consequence is the creation of the Special Compensation P&I Clause (SCOPIC) by the International Group of P&I Clubs. The clause can be incorporated to LOF contracts, and if ever invoked by the salvor it replaces completely the Salvage Convention 1989 Article 14. The main feature of the SCOPIC is that it provides with a different method for assessing remuneration, based on pre-agreed tariff rates. Thus, providing a new framework of remuneration besides the 1989 Salvage Convention.

The SCOPIC can be incorporated to a LOF contract in respect of a FNPP. The assessment method of the award under this clause does have its particularities, and the salvor would have to be cautious when invoking it. However, it could be a better solution than the Salvage Convention 1989 Article 14 if the FNPP does threaten the environment when requiring salvage.

¹⁶² Simon Baughen, *Shipping Law* (7th edn, Routledge 2019) Ch. 15, Pag. 303

Chapter 5 CONCLUSION

The only considered subjects of salvage in Admiralty law are those qualified as such by the High Court of Admiralty and by statute, and comprehend only property involved in navigation. The traditional subjects of salvage comprise a relatively narrow list of properties to fall within this criteria. However, Salvage Convention 1989 provides a wider scope of interpretation in respect of qualification as subject of salvage. Thus, a 'vessel' is defined as "any structure capable of navigation"¹⁶³, and it is submitted this wording can be extended to several structures also includes "capable of being towed".

Even though Courts have not address it yet, I believe that, with the correct interpretation of the Salvage Convention 1989, there are solid grounds to consider a Floating Nuclear Power Plant as a structure subject of salvage under the Salvage Convention 1989.

In respect of the exclusion of platforms and drilling units provided by Salvage Convention 1989 Article 3, the convention presents an *ad hoc* provision directly requested from the oil and gas industry. Thus, the wording concerns structures involved in such industry, predominantly for drilling purposes, and seems difficult to understand the exclusion of activities other than drilling.

However, this arrangement appears to be perfectly reasonable. A salvage operation rendered by a casual salvor, to a structure which is presumed to be highly complex and dangerous, can do more bad than good. Yet, in my opinion, a statute exclusion is not necessary for FNPPs. It is not the case of a large industry with hundreds of structures of this kind, up to date a single FNPP is operating.

A solution to this problem would be a LOF contract specially designed for a FNPP, which ensures that the salvor is prepared to overcome the operation. Moreover, the former discussion on subjects of salvage will be unnecessary, as the LOF contract can cover FNPPs irrespectively of the precise definition of its nature.

¹⁶³ International Convention on Salvage, Art. 1 (b)

When a towage operation involves a FNPP, it is possible to consider such structure as a proper subject of salvage under the definitions provided by the Salvage Convention 1989. In particular the understanding of property as "any property not permanently and intentionally attached to the shoreline"¹⁶⁴, considered wide enough to cover almost all water-borne objects without the need to discern whether if they fall within one of the traditional subjects of salvage. Thus, in the case *Maridive VII v Key Singapore*¹⁶⁵ no considerations were made in respect of a 'Jackup Rig' not being a subject of salvage. The only concerns presented were in respect of contribution and apportionment of liability.

Moreover, one of the main issues in respect of salvage services rendered under existing contracts is to identify the precise moment at which a towage service transforms into a salvage operation. Requiring unforeseen circumstances that places the tow in danger and performance of services out of the scope of the original engagement.

However, this latter dispute rarely constitutes a problem nowadays. Both salvage and towage services are normally rendered under specific contracts. Thus, salvage under a LOF contract would also help to avoid certain issues arising from a salvage operation rendered to a towage convoy involving a FNPP.

The property involved in the operation of a FNPP may present some of the biggest concerns, in particular the nuclear reactor, low-enriched uranium and the stored radioactive waste. Such property can be encompassed under the concept of cargo or apparel, the latter in the case of the nuclear reactor, both recognised as subject of salvage under the traditional subjects of salvage and the Salvage Convention 1989.

There is a large framework of international regulation in respect of the carriage of dangerous goods, and although most of the regulations are under a commerce perspective, same legal difficulties may be anticipated if pollution is caused by chemical spillages from a mobile offshore structure, such as a FNPP. The potential threats from a FNPP are obvious; mainly involve the operation of the nuclear reactors and radiation danger from stored used fuel and the complex

¹⁶⁴ International Convention on Salvage, Art. 1 (c)

¹⁶⁵ *Maridive VII v Key Singapore* (n 59)

refuelling operations. In this respect, environmental salvage plays a particular role, as the provisions from the Salvage Convention 1989 are not limited to pollution from petroleum products.

However, the concepts of 'Safety net' and 'Enhanced Award' as enacted by the Salvage Convention 1989 present some difficulties at the time of assessment and interpreting the definition of expenses when considering environmental salvage. The salvage industry has created the SCOPIC to provide with a new framework for assessing remuneration, based on pre-agreed tariff rates. Thus, settling a better solution for environmental salvage when it is performed under LOF contracts.

The construction of a FNPP and its subsequent operation leave open a multitude of issues. Major advances in the maritime world have almost always followed a marine casualty, the so-called "Titanic factor", and salvage industry should be prepared to confront a salvage operation in respect of a FNPP. Thus, if a Floating Nuclear Power Plant ever requires a salvage operation; its performance under a LOF contract would be highly advisable, as it provides with the frame and tools to approach and develop the operation in a more precise and safer manner.

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