

# Is Environmental Salvage an Oxymoron? A Law and Economics Analysis

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# Is Environmental Salvage an Oxymoron? A Law and Economics Analysis

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## 1. INTRODUCTION

In maritime law, the concept of salvage is a very old and common feature that essentially allows a (usually specialized) company, the salvor, to recover valuables from a ship in distress (usually one that was in difficulties or even sunk) on a “no cure – no pay (NCNP)” basis.<sup>1</sup> This recovery could include the distressed vessel, cargo, and bunker onboard.<sup>2</sup> The idea was that the salvor would, with specialized equipment, material, and skilled personnel recover some value from the ship for the benefit of the owners but would only be paid in the case of a successful salvage.<sup>3</sup> The payment would often be expressed as a percentage of the property that was recovered.<sup>4</sup> Salvage was thus to the benefit of the cargo owner as the cargo would be totally lost otherwise.<sup>5</sup> And the NCNP system provided incentives to the salvor to make a calculated assessment of the possible risks and benefits because they would not be paid if the salvage turned out to be impossible (for example because of the circumstances at sea or because of the depth at which the vessel was located). In traditional law and economics literature, salvage was therefore considered as an efficient wealth-maximizing feature of maritime law.<sup>6</sup> Recently, a new phenomenon has emerged that is referred to as “environmental salvage,”<sup>7</sup> which is fundamentally different from traditional salvage. Traditional salvage is defined “as a service [that] confers a benefit by saving or helping to save a recognised subject of salvage.”<sup>8</sup> In the case of environmental salvage, the salvors’ services not only confer a benefit by saving property but also, and sometimes exclusively, by protecting the environment from potentially

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1. Geoffrey Brice, *Law of Salvage: A Time for Change No Cure-No Pay No Good*, 73 TUL. L. REV. 1831, 1832-33 (1999).

2. FRANCIS ROSE, KENNEDY AND ROSE ON THE LAW OF SALVAGE, ch. 4 (9th ed. 2017).

3. *Id.* § 9-005.

4. *Id.* § 1-028.

5. *Id.* §§ 1-028, 4-041.

6. See William M. Landes & Richard A. Posner, *Salvors, Finders, Good Samaritans, and Other Rescuers: An Economic Study of Law and Altruism*, 7 J. LEGAL STUD. 83, 104 (1978).

7. See Archie Bishop, *The Development of Environmental Salvage and Review of the London Salvage Convention 1989*, 37 TUL. MAR. L.J. 65, 89 (2012).

8. ROSE, *supra* note 2, § 1-016.

large damage.<sup>9</sup> An example would be a case where hazardous or noxious substances were on board a vessel where hazardous or noxious substances that potentially could create large harm to the marine environment and potentially economic losses (and maybe even health damage) to coastal areas as well were on board a vessel. Again, a salvor can intervene to remove the hazardous substances from the ship, but in this particular case, the classic reward system obviously cannot operate as there are no proceeds, only an avoidance of costs and pollution.<sup>10</sup> In this case, there is therefore a need for another system to pay the salvor.

Various solutions have been worked out in practice to deal with environmental salvage with some laid down in conventions and others being of a more contractual nature. For example, Article 14 of the Salvage Convention 1989 provides for special compensation to the salvor who carried out salvage operations for a vessel that threatened damage to the environment.<sup>11</sup> But contractual solutions have equally been developed in the so-called Lloyds Open Form (LOF) and in the so-called SCOPIC clause, which is a contractual solution aimed at special compensation to remunerate the salvor beyond the provisions in the Salvage Convention.<sup>12</sup>

Notwithstanding these contractual and conventional solutions, problems remain. The stakeholders criticize the current arrangements as the payments for the salvor are not always considered a sufficient reward and thus reduce the incentives of salvors to engage in environmental salvage, obviously leading to environmental harm or at least danger.<sup>13</sup> The most recent attempt from the stakeholders for law reform was the International Salvage Union's proposal of "Environmental Salvage Awards" at the 2012 CMI Beijing Conference that tried but failed to create a separate reward for environmental services in salvage operations within the salvage regime.<sup>14</sup>

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9. *Id.* § 6-001.

10. See ROSE, *supra* note 2, § 6-002.

11. International Convention on Salvage art. 14, *done* Apr. 28, 1989, S. TREATY Doc. No. 102-12 [hereinafter Salvage Convention 1989].

12. ROSE, *supra* note 2, §§ 6-003 to -006.

13. See Bishop, *supra* note 7, at 91-92.

14. See Robert Wallis, ISU Opening Address and Closing Comments (Oct. 15, 2012), in YEARBOOK 2013 ANNUAIRE – BEIJING II DOCUMENTS OF THE CONFERENCE 254, 254-257 (2013).

A variety of solutions have been suggested in the (maritime) literature, but, so far, this debate has not been enriched by a law and economics approach.<sup>15</sup> The goal of this contribution is to show that environmental salvage is an oxymoron (because there are no proceeds with which the salvor can be paid) and, subsequently, to analyze the possible payment structures that could give appropriate incentives for a cost-effective environmental salvage. The problem with the current literature is that there is often a large amount of path dependency as a result of which solutions are still examined within the traditional paradigm of salvage within maritime law. The economic approach to law can allow for new insights to the debate by thinking out of the box of the traditional maritime law perspective. The rationale of salvage rewards is discussed under various streams of literature.

This paper will be set up as follows: first, a review of the literature concerning (environmental) salvage will be provided with a strong focus on the law and economics (2). Then it will sketch the specific features of environmental salvage (3), discuss the solutions worked out so far for environmental salvage (4), and proceed with a law and economics analysis (5). Next, the current reform proposals concerning environmental salvage will be analyzed in the light of the economic literature (6). Section 7 concludes.

## 2. LITERATURE REVIEW

This paper will first address the economics of salvage rewards under the “no cure – no pay” principle (2.1) and then argue that the “no cure – no pay” model may not work in environmental salvage, so the literature holds (2.2).

### 2.1 *Efficiency of the Salvage Reward and the “No Cure - No Pay” Principle*

The economic rationale of salvage has *inter alia* been addressed by two well-known Chicago law and economics scholars, William Landes and Richard Posner. Landes & Posner’s analysis starts with the notion of salvage being that “[s]alvage is anything

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15. There is one paper by Wayne T. Brough that addresses liability salvage from an economic perspective, but it does not explicitly address environmental salvage. See Wayne T. Brough, *Liability Salvage—By Private Ordering*, 19 J. LEGAL STUD. 95, 95-96, 111 (1990).

rescued from navigable waters, including ships, cargo, goods washed out to sea, and even aircraft downed at sea.”<sup>16</sup> As they rightly pointed out, the principles and requirements for a right to a salvage reward and the criteria for fixing the reward *ex post*, as developed in the admiralty jurisdiction in England,<sup>17</sup> “suggest that the purpose of salvage awards is to encourage rescues [at sea] in settings of high transaction costs by simulating the conditions and outcomes of a competitive market”<sup>18</sup> and to encourage “efficient resource allocation.”<sup>19</sup> They argue that the relationship between the salvor and the salvee is one of bilateral monopoly.<sup>20</sup>

The literature distinguishes several criteria to construct a salvage contract in a way in which it would have been negotiated *ex ante* if a competitive market transaction had been feasible.<sup>21</sup> The first ingredient is voluntariness, meaning that there should not be a pre-existing contractual relationship between the salvor and the salvee;<sup>22</sup> the second ingredient is danger, meaning that the salvage must occur as a result of circumstances that have endangered the vessel, her cargo and other recognized subjects of salvage;<sup>23</sup> and the last is success, meaning that the size of the salvage reward is restricted to the value of salvaged property.<sup>24</sup> Landes and Posner argue that it is “economically correct” that the amount of the salvage award is fixed more than that on a “quantum meruit” basis;<sup>25</sup> and they note that “[i]t is well established that the professional salvor is entitled to more liberal compensation than the

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16. Landes & Posner, *supra* note 6, at 100.

17. *See generally* ROSE, *supra* note 2, § 1-001.

18. Landes & Posner, *supra* note 6, at 100.

19. *Id.* at 102.

20. *Id.* at 91. A bilateral monopoly generally is referred to as “a situation where there is a single (or few) buyer(s) and seller(s) of a given product in a market.” *See* OECD, Glossary of Statistical Terms 50 (2008), [https://read.oecd-ilibrary.org/economics/oecd-glossary-of-statistical-terms\\_9789264055087-en#page4](https://read.oecd-ilibrary.org/economics/oecd-glossary-of-statistical-terms_9789264055087-en#page4). In the specific context of salvage, the bilateral monopoly refers to the fact that there are usually only one or a few salvors that could offer services, and the number of customers that might want to use the salvors’ services is very limited as well, thus both the salvors and the customers are in a monopoly position respectively.

21. *Id.* at 102.

22. *Id.* at 100.

23. *Id.*

24. *Id.* at 101.

25. *Id.*

amateur” which should “cover the costs of maintaining stand-by capacity” “[t]o encourage the creation of a class of professional salvors[.]”<sup>26</sup> The reason is in the alternative situation, “resources employed in other activities [other than salvage operations] would have to be mobilized[.]” “and the delay might defeat a successful rescue.”<sup>27</sup>

Landes and Posner further argue that the age-old “no cure – no pay” principle that restricted salvage awards to cases of successful salvage is efficient for two reasons. First, it reduces the number of legal proceedings “while the courts . . . can compensate the salvors for their unsuccessful attempts” by adjusting the award in successful salvage.<sup>28</sup> Second, taking success as a crucial ingredient may reduce the high monitoring costs of salvor’s efforts and energy for fixing the reward *ex post*.<sup>29</sup> Moreover, without the success ingredient, the salvor may reduce his effort for a given quantity of rescue inputs.<sup>30</sup>

## 2.2 NCNP Model Not Efficient in Environmental Salvage

The traditional salvage law and standard NCNP salvage agreements, as argued by Wayne T. Brough in his paper on the concept of liability salvage, were designed to handle the “problems of opportunism and asset specificity” in salvage, but they become inefficient for failing to take into account “the growing risks of tort liability for pollution and environmental damage[.]”<sup>31</sup> Brough argues that “the costs of preventing and controlling [environmental] damage” in salvage could “exceed[] the value of the ship and its cargo.”<sup>32</sup> But salvors “received no benefit for pollution abatement activities” as saving property is required under NCNP model.<sup>33</sup>

The concept of environmental salvage is also addressed in maritime law, *inter alia* by Mukherjee, a well-known maritime law scholar who was connected to the IMO World Maritime University. Mukherjee argues that the shipowner is held liable for the

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26. *Id.* at 102.

27. *Id.*

28. *Id.* at 104.

29. *Id.*

30. *Id.*

31. Brough, *supra* note 15, at 96.

32. *Id.* at 102.

33. *Id.*

“reimbursement [for] salvor’s expenses” under the rubric of “special compensation’ pursuant to the Salvage Convention [of 1989]” “as a matter of public policy” but not for salvage.<sup>34</sup> Liu argues that the existing salvage law governs two different types of services provided by salvors, namely salvage and environmental protection service,<sup>35</sup> and it is unclear whether the NCNP model “will eventually give way to . . . a purely contractual arrangement devoid of the traditional ingredients of salvage . . . .”<sup>36</sup> Brough further argues that, due to the “sweeping changes” in the shipping and salvage industry from both technological and environmental perspectives, contractual solutions<sup>37</sup> are becoming more valuable in salvage law as “[e]xternalities now play a crucial role in salvage[.]”<sup>38</sup>

Furthermore, Brough argues that the development of modern salvage law “demonstrate[es] the weaknesses of legal centralism” and in response to the phenomena of environmental salvage, economic agents affected by a changing market created an entire set of institutions;<sup>39</sup> the parties involved have carefully drawn from these sources to generate contractual solutions that can be considered “an efficacious governance structure for [environmental] salvage.”<sup>40</sup>

### 3. FEATURES OF ENVIRONMENTAL SALVAGE

Before sketching how the contracting parties and the law have dealt with the question of environmental salvage, one must

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34. Proshanto K. Mukherjee, *Salvage at Crossroads: Some Idle Thoughts and Reflections*, in CURRENT PROBLEMS IN INTERNATIONAL MARITIME LAW, LIBER AMICORUM IN LOVING MEMORY OF PROF. DR. A. N. YIANNOPOULOS 337, 338 (Pinar Akan ed., 2017).

35. HUIRU LIU, ENVIRONMENTAL PROTECTION SERVICES AND SALVAGE LAW: EMERGING ISSUES IN PERSPECTIVE, 201-203 (Maximo Q. Mejia, Jr. & Jens-Uwe Schröder-Hinrichs eds., 2020) [hereinafter LIU, ENVIRONMENTAL PROTECTION SERVICES], [https://commons.wmu.se/phd\\_dissertations/9/](https://commons.wmu.se/phd_dissertations/9/).

36. Huiru Liu, *Environmental Salvage: ‘No Cure – No Pay’ in Transition*, 23 J. INT’L MAR. L. 280, 294 (2017) (U.K.) [hereinafter, Liu, *Environmental Salvage*].

37. These contractual solutions (like LOF and the SCOPIC clause) will be discussed in detail in the next section.

38. Brough, *supra* note 15, at 110.

39. *Id.* at 110-11.

40. *Id.* In this respect, he more particularly refers to the LOF, which will be discussed in the next section.



first address the specific features of environmental salvage that explain why they may constitute a challenge for a contractual and regulatory framework.

A first problem with environmental salvage is that there may be many different situations in which a salvage situation may occur. There is, for example, a situation where a liable party can be identified who might be under a legal duty to prevent or minimize damage to the environment. This situation has to be contrasted with the situation where, for some reason or another, the liable party does not take any initiative with respect to salvage. This could be the case, for example, where a distressed vessel was declared a constructive total loss (CTL) by the property insurers. This situation could happen in the case that the costs of saving the vessel and cargo on board exceed the possible salvaged value (or the repair costs). The property insurers could then decide to simply let the vessel sink into the ocean. Formally, the vessel becomes a "wreck" in that case with obviously little-to-no economic value left. However, a demand for minimizing the damage to the environment from the wreck can still emerge. In that particular case, the party interested in minimizing the damage to the environment is no longer the shipowner (or his insurer) but, rather, public authorities aiming to protect the environment. But the legal solutions adopted in those different scenarios might vary as well.

A second feature of environmental salvage is that *ex ante* contracting that concerns the details of the salvage operation (more particularly the efforts to be undertaken by the salvor and the corresponding price) may often be difficult or even be impossible in practice.<sup>41</sup> This feature is related to the next point, which is that not all information necessary for efficient contracting may be available, but in addition, speed may be of the essence given the environmental emergency. As a result, time for bargaining concerning the optimal contractual conditions for the environmental salvage may be lacking. As a result, the environmental emergency, in practice, may need a rapid response as a result of which contractual details have not been specified. That result may explain why, in practice, a standard form may be used by both parties that

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41. Landes and Posner equally make the point that negotiating *ex ante* over low probability events will impose higher contracting costs on the parties. See Landes & Posner, *supra* note 6, at 100-01.

would roughly determine the conditions under which the environmental salvage would take place. In a situation where speed is of the essence (given the environmental emergency), a standard form could be used by the parties in order to reduce transaction costs.

A third feature is that at the moment that parties engage in environmental salvage, a lot of essential information needed—for example, to determine the price of the environmental salvage operation—may be lacking. At the moment that the environmental emergency occurs, there can still be uncertainty about the nature of the danger or the potential harm or the specific risks involved. As a result, it may also be difficult for the salvor to determine an appropriate price for the salvage operation given those uncertainties. Moreover, sometimes salvage operations can have a transboundary character, meaning that the various parties involved could be located in different countries. The transboundary element can obviously add to the uncertainties as it may be more difficult to assess risks and costs across borders.

A fourth feature of environmental salvage is that a wide variety of different players and stakeholders may be involved, and this situation can equally affect the market. In that respect, one should distinguish between the supply and demand side.

On the supply side, the salvors that could engage in environmental salvage are relatively few in number and highly specialized.<sup>42</sup> The reason is that exercising an environmental salvage operation may require upfront investments in expensive material that needs to be stored in station until the moment that a salvage operation has to be carried out. De facto, this situation could mean that expensive equipment worth several millions of euros would have to be purchased, even though that material may only be used

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42. The International Salvage Union (ISU) has 55 full members worldwide which are active in the salvage industry. These members have a track record of providing successful salvage services. The salvage industry is facing economic pressure, and some famous companies who have the capacity to provide salvage services have either ceased to exist or switched to businesses other than salvage in recent years. *See, e.g.*, INT'L SALVAGE UNION ANN. REV. 2020 (Int'l Salvage Union, London, England), 2020, at 1, 3, 8 [hereinafter ISU ANN. REV. 2020], [https://www.marine-salvage.com/wp-content/uploads/2021/07/ISU\\_Annual\\_Review\\_2020.pdf](https://www.marine-salvage.com/wp-content/uploads/2021/07/ISU_Annual_Review_2020.pdf). One example is the demise of Ardent in 2020; it was formed through mergers of three famous salvage companies: Titan, Svitzer and Mammoet. *See id.* at 3.

on very specific occasions.<sup>43</sup> This scenario implies that very high upfront investments in salvage material are necessary and can only be afforded by a few very specific large players. That situation obviously also implies that the number of participants in these specialized markets will be limited. Not only may there be an oligopoly but also, de facto, there could sometimes be a situational monopoly, meaning that, de facto, only a few very specialized salvors would have the possibility to engage in the environmental salvage.<sup>44</sup>

As a result of this structure, the fees charged for the environmental salvage will be relatively high as they have to cover the high upfront investments made by the salvors as well as the risks in the salvage operation given the uncertainties involved.

As far as the demand side is concerned, this paper has already indicated that different stakeholders could be involved. In the normal situation, the environmental emergency might have been created as a result of a ship in distress, implying that a shipowner would normally be under a legal duty to prevent an environmental disaster from occurring. In that situation, it would be the shipowner or a related party who would take the initiative for the environmental salvage. Such a related party could, for example, be a liability insurer or a Protection and Indemnity (P&I) Club. The other case might be the one where, for some reason or another, it is not possible to hold the shipowner responsible but public authorities demand the absolute prevention of the environmental risk. In that particular case, the demand for environmental salvage is more likely to come from the public authorities involved. However, the intervention of public authorities can equally create problems for the salvors as authorities may intervene in the salvage operations in order to prevent pollution in their territorial waters. The result could be that authorities refuse to grant the salvor a place of refuge for the distressed vessel,

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43. Keeping the equipment in station at all times equally implies that the salvor can respond to maritime casualties in a timely manner; but it means that the salvor has to make substantial investments without the certainty of making an appropriate profit.

44. See Landes & Posner, *supra* note 6, at 100-01.

which could endanger a successful salvage operation.<sup>45</sup> This event occurred de facto in the *Torrey Canyon* oil spill disaster. The British government refused to grant a place of refuge for the ship and, as a result, the ship had to be tugged to the high sea and the government subsequently gave orders that the wreck be destroyed by aerial bombardment with the hope that it could burn off the estimated 40,000 tons of oil remaining onboard.<sup>46</sup>

A fifth feature is that the salvor is usually the first responder in the case of a maritime casualty. For that reason, it is often considered preferable that the salvor (who is already in place) would intervene to prevent further environmental harm as this may be less costly than engaging yet another company that was not a first responder. Furthermore, environmental services are highly integrated with salvage operations performed by the salvor because factual distinction between environmental services and salvage operations (as in saving property) is difficult to maintain in a practical sense.<sup>47</sup> The problem is, however, that the compensation is still based on an NCNP model that is most likely not the reward structure that would have been negotiated *ex ante* if a competitive market transaction had been feasible for the environmental services rendered in salvage operations.

A sixth feature is that there may be substantial conflicts of interests between the different parties involved and, more particularly, the insurers. The conflict arises between the insurers of the property interests on the one hand (usually more traditional maritime insurers) and the P&I Clubs on the other hand, who engage in covering the liability of shipowners (and charterers). The conflict of interests among commercial parties, especially the insurers, makes it difficult for the salvage regime to develop quickly. The insurers' influence is critical to the law reform because of their roles as bills-payers to the salvors. Thus, it is their support of the reward system that determines the salvors' confidence in the solvency of the salvees, the absence of which, as argued by

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45. Proshanto K. Mukherjee, *Refuge and Salvage*, in PLACES OF REFUGE FOR SHIPS: EMERGING ENVIRONMENTAL CONCERNS OF A MARITIME CUSTOM 271, 271-72 (Aldo Chircop & Olof Linden eds., 2006).

46. COLIN DE LA RUE & CHARLES B. ANDERSON, SHIPPING AND THE ENVIRONMENT: LAW AND PRACTICE 10 (2nd ed. 2009).

47. Michael Howard, *CTL—Hit and Miss in The Supreme Court*, LLOYD'S MAR. & COM. L.Q. 433, 442-43 (2020).

Levmore, could cause inefficiency in a privately financed reward system.<sup>48</sup>

#### 4. SOLUTIONS FOR ENVIRONMENTAL SALVAGE SO FAR AND THEIR LIMITATIONS

##### 4.1 *Preliminary Remarks*

“In international maritime commerce,” as argued by Landes & Posner, “there is no central authority to impose an inefficient rule on its subjects” and “[t]hus[,] the nation that adopts the most efficient admiralty rules will increase its share” of the market.<sup>49</sup> As Brough rightly pointed out, innovations in salvage law and practice regarding environmental salvage have mainly come “from a wide range of distinct sources operating in a pluralistic environment” in which economic agents take it as business risks; it is “[t]he market, not the courts, [that] has driven innovation[s ] and through arbitration has policed its consequences.”<sup>50</sup> In line with their observations, the Lloyd’s of London, a leading marine insurance market, has developed the so-called Lloyd’s Open Form (LOF) as a standard open form agreement to provide the LOF arbitration as an *ex post* dispute resolution mechanism regarding salvage rewards for emergency response, i.e. traditional (property) salvage.<sup>51</sup> English law is the governing law by default.<sup>52</sup>

Due to the emergence of environmental salvage, the industry has attempted to provide adequate compensation outside the NCNP model. The judicial concept of “liability salvage” (4.2) has been used to create a separate reward for environmental salvage in the convention: Lloyd’s pioneered changes by creating a “Safety net provision” in the LOF 1980. Then, the first attempt at law reform failed but led to the “special compensation” in Article 14 of

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48. Saul Levmore, *Waiting for Rescue: An Essay on the Evolution and Incentive Structure of the Law of Affirmative Obligations*, 72 VA. L. REV. 879, 886 (1986).

49. Landes & Posner, *supra* note 6, at 118.

50. Brough, *supra* note 15, at 110-11.

51. *Lloyd’s Open Form (LOF)*, LLOYD’S, <https://www.lloyds.com/resources-and-services/lloyds-agency/salvage-arbitration-branch/lloyds-open-form-lof> (last visited Nov. 23, 2022).

52. *Lloyd’s Standard Form of Salvage Agreement*, LLOYD’S, § J (Jan. 1, 2020), <https://assets.lloyds.com/assets/pdf-lloyds-open-form-lof-lof-2020/1/pdf-lloyds-open-form-lof-LOF-2020.pdf>.

the Salvage Convention 1989 (4.3). Now, the LOF accommodates the SCOPIC clause to replace Article 14 special compensation (4.4). An attempt failed to reform the Convention by creating “Environmental Salvage Awards” (4.5). There are, however, also possible solutions within non-salvage regimes that concern ship source pollution and wreck removal (4.6).

#### 4.2 *Judicial Solutions: Enhanced Reward and Liability Salvage*

The English Admiralty Court made the first departure from the NCNP principle by introducing an enhanced reward to a salvor who saved life in addition to property.<sup>53</sup> “[L]ife salvage[,]” referring to such phenomena, *per se* is not a kind of salvage in the sense of salvage law but rather “a species of salvage created by the Act of Parliament[.]”<sup>54</sup> This concept of life salvage would be applied in cases where the services rendered by the salvor “could not be remunerated by an enhanced award against any property saved from the casualty by the same salvor[.]”<sup>55</sup> The award in this instant case would still be for services rendered for saving the vessels, cargo and freight, enhanced by services performed for saving of life.<sup>56</sup> “[B]y the practice of the Admiralty Court, an award made in [such cases] was treated in its entirety as “salvage charges[.]”<sup>57</sup> The second departure from the NCNP principle attempted by the English Admiralty Court was in *The Whippingham* case.<sup>58</sup> In that case, Mr. Justice Bateson held that, “[t]he mere saving of a vessel from damage to other ships which might result in claims is a service[,]” and further stated that “that in itself would be a ground of claim for salvage.”<sup>59</sup> This judgement, however, has seldomly been followed by other courts. The concept of salvage was extended to take account of the ship’s interests in avoiding third

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53. *The Fusiller* (1865), BR & L. 354, 397-98 (Eng.); *see also* *The Bosworth* (No. 1) (1960), 1 Lloyd’s Rep. 163, 168-69 (Eng.).

54. DE LA RUE & ANDERSON, *supra* note 46, at 540.

55. *Id.*

56. *Id.*

57. *Id.*

58. *The Whippingham*, 48 Lloyd’s L. Rep. 49, 51-53 (Adm. 1934).

59. *Id.* at 52.

party liabilities and the term “liability salvage” is used to describe such a scenario.<sup>60</sup>

The salvage rewards made in accordance with the two concepts, however, are still contained within the NCNP model.<sup>61</sup> The mere fact of saving life or avoiding third party liabilities by the salvor does not entitle it to a right to a salvage reward; only if the property is partially or wholly saved, can the benefits conferred by life salvage or liability salvage be an enhancing factor to be taken into account to fix the salvage reward. The rationale has been explained as the ancient foundation for the right to salvage in the Admiralty jurisdiction is a proceeding in rem,<sup>62</sup> and the salvage reward can only be paid out of the salvaged fund that is made out of the salvaged value of the property.<sup>63</sup>

#### 4.3 *Intertwined Contractual and Convention-law Solutions: Safety Net and Special Compensation*

The LOF revision working party initially proposed a “pollution fund” based on the concept of liability salvage.<sup>64</sup> The P&I Clubs, as the shipowners’ liability insurers who would bear the financial burden, strongly opposed this fund, and they “advanced a safety-net proposal which was later adopted in the revised form, LOF 1980.”<sup>65</sup> The LOF 1980 Clause 1 functioned as a “safety net” for a salvor by providing that they would be rewarded for reasonably incurred expenses plus a maximum 15% increment of these expenses even if the services were not or only partially successful or they were prevented from completing the services on the condition that there was no negligence by the salvor or their agents’

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60. See Haiyang Yu, *Rethinking ‘Liability Salvage’ – Is There Still a Need for Such a Separate Salvage Reward?*, in *MARITIME, PORT AND TRANSPORT LAW: CURRENT SCENARIOS AND EMERGING ISSUES* 107, 143 (Francesco Berlingieri & Massimiliano Musi eds., 2017).

61. Liu, *Environmental Salvage*, *supra* note 36, at 285.

62. *The Zephyrus*, 1 W. Rob. 329, 331 (1842); *see The Fusilier*, 3 Moore N.S. 51, 55-56 (1865); *Cargo ex Schiller*, 3 Asp. Mar. L. Cases 439, 439-40 (1877).

63. ROSE, *supra* note 2, at § 15-001.

64. Recall that liability salvage refers to the fact that the salvor avoids the shipowner’s third-party liability by taking measures to prevent environmental harm.

65. DE LA RUE & ANDERSON, *supra* note 46, at 544.

part.<sup>66</sup> Such expenses and the increment were defined as including the salvor's actual out-of-pocket expenses and a fair rate for all tugs, craft, personnel and other equipment used in the services.<sup>67</sup> However, such an award was only available where the distressed vessel in question was a tanker laden or partially laden with a cargo of oil and the claim was only to be made against the tanker owner.<sup>68</sup> The safety-net provision was backed up by a funding agreement between P&I Clubs and property underwriters under which it was agreed that the P&I Clubs would bear the full costs under Clause 1 and provide security for it.<sup>69</sup>

After the *Amoco Cadiz* spill in 1978,<sup>70</sup> it became equally necessary to change the international conventions on the subject with the goal of adopting global solutions for environmental salvage. The liability salvage was again proposed and then abandoned largely due to the opposition from the P&I Clubs, and the Article 14 Special Compensation was introduced and was a departure from the NCNP principle; it reflects the "Safety Net" in the LOF 1980.<sup>71</sup> In accordance with the Salvage Convention 1989, the traditional NCNP reward under Article 13 can be enhanced for the skill and efforts of the salvor in preventing or minimizing damage to the environment;<sup>72</sup> a salvor is entitled to special compensation under Article 14 if they carried out salvage operations of saving property that threatened damage to the environment but failed to earn an Article 13 reward plus the enhancement that is at least equivalent to the special compensation assessed.<sup>73</sup> The shipowner alone is liable for the payment of special compensation that is determined based on the 'salvor's expenses' as defined by Article

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66. *Id.* at 545.

67. *Id.*

68. *Id.*

69. *Id.* at 546.

70. On March 16, 1978, the tanker *Amoco Cadiz* ran aground off the coast of Brittany, France, after a steering gear failure. See F. Bonnieux & P. Rainelli, *Learning from the Amoco Cadiz Oil Spill: Damage Valuation and Court's Ruling*, 7 INDUS. & ENV'T CRISIS Q. 169, 170 (1993). "The wreck [of the tanker] resulted in one of the largest oil spills in the world, damaging over 200 miles of [the French coastline]." *Id.*

71. Liu, *Environmental Salvage*, *supra* note 36, at 287.

72. Salvage Convention 1989, *supra* note 11, art. 13(1)(b).

73. *Id.* art. 14(1).



14(3).<sup>74</sup> Furthermore, if the salvor by his salvage operations has prevented or minimized damage to the environment, the payable special compensation may be increased up to a maximum of 30% of the salvor's expenses, and the tribunal may, at its discretion, further raise this compensation to up to 100% of the salvor's expenses.<sup>75</sup> The payable amount of special compensation is the balance of the amount assessed minus the Article 13 reward; if the Article 13 reward is greater than the assessed amount of special compensation, then no special compensation would be payable.<sup>76</sup> Article 14 Special Compensation is in essence a reiteration of the safety net in LOF 1980 but with a higher increment and broader applications regarding vessel types and geographical scope as defined in Article 1 (d).<sup>77</sup> The LOF was redesigned (into the LOF 90) to keep pace with the Salvage Convention 1989; the subsequent versions of the LOF incorporate both Article 13 and Article 14.

However, the special compensation regime was considered unworkable by the industry. The House of Lords decision in the *Nagasaki Spirit* case (1997) provides that 'salvor's expense' in Article 14 should not contain an element of profit.<sup>78</sup> This decision left the salvage industry dissatisfied, and it is argued that the current salvage regime failed to adequately recognize their efforts in environmental salvage; the professional salvors cannot remain in the business given that they need to invest a substantial amount of capital to keep their equipment and personnel in station to render timely salvage services.<sup>79</sup> Moreover, the insurers were not satisfied with the Special Compensation: P&I clubs were disappointed as it is time-consuming and expensive to assess special compensation, and insurers who eventually needed to pay for

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74. See *id.* art. 14(3).

75. *Id.* art. 14(2).

76. *Id.* art. 14(4).

77. Liu, *Environmental Salvage*, *supra* note 36, at 287; see also Salvage Convention 1989, *supra* note 11, art. 1(d) (providing that "[d]amage to the environment means substantial physical damage to human health or to marine life or resources in coastal or inland waters or areas adjacent thereto, caused by pollution, contamination, fire, explosion or similar major incidents.").

78. Liu, *Environmental Salvage*, *supra* note 36, at 288; see *Semco Salvage & Marine Pte. Ltd. v Lancer Navigation Co. Ltd. (The Nagasaki Spirit)* [1997] AC 455, for the underlying *Nagasaki Spirit* case.

79. Liu, *Environmental Salvage*, *supra* note 36, at 288.

salvage charges in general felt they did not get sufficient information under the special compensation regime.<sup>80</sup>

#### 4.4 *Current Contractual Solution: the SCOPIC clause*

The commercial interests worked together to design the SCOPIC clause as a replacement for the Article 14 Special Compensation of the Salvage Convention 1989 to de facto circumvent the salvage regime in the post *Nagasaki Spirit* era.<sup>81</sup> The SCOPIC is a supplementary contractual instrument that can be incorporated in the LOF by express consensus.<sup>82</sup> It endorsed the idea of Article 14 that special compensation for the salvor's expenses and a fair rate for tugs and equipment used should be provided to the salvors when the salvaged value was insufficient to allow them to recover an adequate remuneration via a traditional NCNP reward.<sup>83</sup>

The SCOPIC clause consists of 16 sub-clauses accompanied by three appendixes<sup>84</sup> and two codes of practice.<sup>85</sup> If it is incorpo-

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80. *Id.* at 288-89.

81. *Id.* at 289.

82. *Id.*

83. *Id.*; see also SCOPIC 2020, LLOYD'S, <https://www.lloyds.com/resources-and-services/lloyds-agency/salvage-arbitration-branch/scopic> (last visited Nov. 11, 2022).

84. See generally *SCOPIC Clause*, LLOYD'S (Jan. 1, 2020), <https://assets.lloyds.com/assets/pdf-scopic-2020/1/SCOPIC-2020.pdf>. Appendix A provides the agreed tariff for calculating the special compensation for salvor's personnel, equipment, etc. See *id.* § 5(ii); *Appendix A (SCOPIC)*, LLOYD'S (Mar. 18, 2022), <https://assets.lloyds.com/media/5840e409-f671-44d5-a837-65d368dde029/Appendix-A-2022-18032022.pdf>. Appendix B is about the "Special Casualty Representative (SCR)" that could be appointed by the Shipowner to attend a salvage operation in accordance with sub-clause 12 of the SCOPIC. See *SCOPIC Clause*, *supra* note 84, § 12; *Appendix B (SCOPIC)*, LLOYD'S (Mar. 18, 2022), <https://assets.lloyds.com/media/bfb4fb6a-817a-4035-b5e8-3728afab0adc/APPENDIX-B-2020-18032022.pdf>. Appendix C is about the "Special Representatives" who may be appointed after SCOPIC is invoked in accordance with sub-clause 13 of SCOPIC. See *SCOPIC Clause*, *supra* note 84, § 13; *Appendix C (SCOPIC)*, LLOYD'S (Mar. 18, 2022), <https://assets.lloyds.com/media/76277fd3-41f1-4cc2-9c52-93783c2b5ed3/Appendix-C-2020-18032022.pdf>. "Special Representatives" is a collective term for a "Special Hull Representative" who may be appointed by a Hull underwriter, and a "Special Cargo Representative" who may be appointed by either the cargo owner, or an underwriter. See *SCOPIC Clause*, *supra* note 84, § 13.

85. See generally *Code of Practice Between International Salvage Union and International Group of P&I Clubs*, LLOYD'S (Mar. 18, 2022), <https://assets.lloyds.com/media/59bf0533-c071-427c-92ea-0447b3631e25>

rated in a LOF and invoked by the salvor, the salvor's remuneration under Article 14 Special Compensation will be replaced by the SCOPIC remuneration that will be calculated with reference to the tariff in Appendix A, and the bonus is fixed at 25%.<sup>86</sup> The tariff rates are constantly being revised according to commercial rates with a profit element. Furthermore, the SCOPIC provides a system of representatives in salvage operations to keep insurers informed and involved.<sup>87</sup> The SCOPIC system is backed up by the industry through codes of conduct, and, most importantly, the P&I Clubs agree to provide security once the SCOPIC is invoked.<sup>88</sup>

The SCOPIC is a departure from the NCNP model, but its application is limited to cases where the LOF applies, which has been decreasing in recent years.<sup>89</sup> The "SCOPIC remuneration" only "include[s] the prevention of pollution as well as the removal of pollution in the immediate vicinity of the vessel insofar as this is necessary for the proper execution of the salvage but not otherwise."<sup>90</sup> This scope of application corresponds to the salvor's duty of using his best endeavors to save the property and, in doing so, to prevent or minimize environmental damage in salvage operations pursuant to the SCOPIC and the LOF.<sup>91</sup> The primary duty of the salvor is still saving property. In fact, "no consideration is given to the degree of success in the salvor's effort in preventing or minimizing damage to the environment."<sup>92</sup> Furthermore, the SCOPIC clause is to ensure that salvors will engage in salvage that is very expensive to carry out but may lead to a small or no

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/Code-of-Practice-ISU-IG-2020-18032022.pdf; *Code of Practice Between the International Group of P&I Clubs and the International Union of Marine Insurance*, LLOYD'S (Mar. 18, 2022), <https://assets.lloyds.com/media/681aba22-bff0-4a2e-a15d-c3862821c8ae/Code-of-Practice-IG-IUMI-2020-18032022.pdf>.

86. *SCOPIC Clause*, *supra* note 84, §§ 1, 5.

87. *Id.* §§ 12, 13.

88. *See generally Code of Practice Between International Salvage Union and International Group of P&I Clubs*, LLOYD'S, § 6 (Mar. 18, 2022), <https://assets.lloyds.com/media/59bf0533-c071-427c-92ea-0447b3631e25/Code-of-Practice-ISU-IG-2020-18032022.pdf>.

89. *See LOF Statistics*, LLOYD'S, <https://www.lloyds.com/lofststatistics> (last visited Nov. 11, 2022).

90. *SCOPIC Clause*, *supra* note 84, § 14.

91. *Id.* § 10; *Lloyd's Standard Form of Salvage Agreement*, LLOYD'S, § A (Jan. 1, 2020), <https://assets.lloyds.com/assets/pdf-lloyds-open-form-lof-lof-2020/1/pdf-lloyds-open-form-lof-LOF-2020.pdf>.

92. Liu, *Environmental Salvage*, *supra* note 36, at 290.

reward.<sup>93</sup> As any negotiated instrument, the clause represents a balance of interests among commercial parties, and it is not a perfect instrument.<sup>94</sup> The SCOPIC clause is a sticking-plaster solution that is agreed upon by the commercial interests but not an ultimate solution to the problem of environmental salvage. For cases where no LOF can be used, it is still the Article 14 Special Compensation of the Salvage Convention 1989 that will be relied on.<sup>95</sup>

#### 4.5 *Failed Attempt to reform the Convention: Environmental Salvage Awards*

The most recent attempt to revise the Salvage Convention 1989 was the proposal of “Environmental Salvage Awards” by the International Salvage Union. The proposal was essentially to remove Article 13.1(b)—“the skill and efforts of the salvors in preventing or minimizing damage to the environment”—from the list of criteria for fixing a traditional NCNP salvage reward that would be payable by the salvee, the shipowner and cargo owners, and, in effect, the property underwriters. It proposed to revise Article 14 Special Compensation into a separate environmental salvage award that would be payable by the shipowner and, in effect, his P&I Club to a salvor who has successfully prevented damage to the environment following a maritime casualty.<sup>96</sup> This proposal was essentially a new name for “liability salvage” and, not surprisingly, was strongly opposed by P&I Clubs and shipowners<sup>97</sup> but supported by property underwriters. The proposal was rejected at the Comité Maritime International (CMI) Conference in 2012.<sup>98</sup>

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93. Howard, *supra* note 47, at 445.

94. Bishop, *supra* note 7, 89.

95. Wallis, *supra* note 14, at 257.

96. See Kiran Khosla, *Salvage Convention Review Salvors' Proposals For Environmental Salvage Award*, in YEARBOOK 2013 ANNUIRE – BEIJING II DOCUMENTS OF THE CONFERENCE 258, 261-262 (2013).

97. Hugh Hurst, *Amending the Salvage Convention 1989 – The International Group of P&I Clubs' View*, in YEARBOOK 2010 ANNUAIRE 499, 507-09 (2010).

98. Mišo Mudrić & Igor Vio, *CMI Beijing Conference and 1989 Salvage Convention*, in IL DIRITTO MARITTIMO 412, 413 (2014).

#### 4.6 Remuneration Under Non-Salvage Regimes

##### i. Compensation From Ship-Source Pollution Regime— "Preventive Measures"

In theory, a salvor who encounters difficulties in collecting the special compensation under the Salvage Convention 1989 could seek for a claim to cover the preventive measures he took under the compensation regime for ship-source pollution. However, the salvor may not be in a better position because the liable party is the shipowner in both cases.<sup>99</sup> The compensation regime for ship-source pollution mainly consists of i) oil pollution related conventions, specifically the 1992 Civil Liability Convention,<sup>100</sup> the 1992 Fund Convention<sup>101</sup> (under which the IOPC Fund 1992 was established) and its 2003 Supplementary Fund, the Bunker Convention,<sup>102</sup> ii) the HNS Convention (not in force)<sup>103</sup> and iii) the Wreck Removal Convention 2007.<sup>104</sup> A salvor's claim under these compensation regimes is problematic for two reasons. First, a successful claim of preventive measures requires the purpose of such actions being for pollution avoidance, but it is open to debate because those actions are highly integrated in the salvage operations.<sup>105</sup> Second, even if such a claim is admissible, the recovera-

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99. DE LA RUE & ANDERSON, *supra* note 46, at 588-90.

100. See Protocol of 1992 to Amend the International Convention on Civil Liability for Oil Pollution Damage, 1969, *done* Nov. 27, 1992, 1956 U.N.T.S. 285.

101. See International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992, *reprinted in Liability and Compensation for Oil Pollution Damage: Texts of the 1992 Civil Liability Convention, the 1992 Fund Convention and the Supplementary Fund Protocol*, IOPC FUNDS 23-41 (2018) (U.K.), <https://iopcfunds.org/wp-content/uploads/2018/12/WEB-IOPC-Text-of-Conventions-ENGLISH.pdf>.

102. International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001, *done* Mar. 23, 2001, T.S. No. 47, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/235987/8489.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/235987/8489.pdf).

103. International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 2010, *done* Apr. 30, 2010, IOPC FUNDS [hereinafter HNS Convention], <https://hnsconvention.org/wp-content/uploads/2019/05/2010-HNS-Convention-English.pdf>.

104. Nairobi International Convention on the Removal of Wrecks 2007, *adopted* May 18, 2007 [hereinafter WRC 2007].

105. DE LA RUE & ANDERSON, *supra* note 46, at 589.

ble amount may be more restricted than under the Salvage Convention 1989 or the SCOPIIC.<sup>106</sup> The assessment of such a claim is in principle for the incurred “costs” without any element of profit.<sup>107</sup> It is not even clear that the salvor’s expenses under this regime would be treated as generously as under the Salvage Convention 1989.<sup>108</sup> In sum, this compensation regime does not provide an alternative solution to environmental salvage as they cannot provide more economic incentives for salvors to make investments for environmental services than under the salvage regime.

ii. *Wreck Removal Law and Practice*

A wrecked vessel may pose a threat to the environment or constitute a hazard for navigation; thus, a coastal state would require the wrecks located in their territorial waters to be removed at the expense of the shipowners and their liability insurers. The Wreck Removal Convention (WRC) was adopted in 2007 and came into effect in 2015. The Convention provides a legal basis for its Member States to extend jurisdiction to deal with wrecks located in their exclusive economic zone.<sup>109</sup> Certain provisions could also be applied to their territory, including their territorial sea.<sup>110</sup> It should be noted that the shipowner’s liability for wreck removal costs under the WRC 2007 will be excluded to the extent that the such liability is in conflict with the 1992 CLC, the HNS, the Nu-

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106. *Id.* at 590.

107. *Id.*

108. *Id.*

109. *See* WRC 2007, *supra* note 104, art. 1(1) (defining “[c]onvention area” as “the exclusive economic zone of a State Party, established in accordance with international law or, if a State Party has not established such a zone, an area beyond and adjacent to the territorial sea of that State determined by that State in accordance with international law and extending not more than 200 nautical miles from the baselines from which the breadth of its territorial sea is measured”); *see id.* art. 1(4) (defining “[w]reck”, following upon a maritime casualty,” as “(a) a sunken or stranded ship; or (b) any part of a sunken or stranded ship, including any object that is or has been on board such a ship; or (c) any object that is lost at sea from a ship and that is stranded, sunken or adrift at sea; or (d) a ship that is about, or may reasonably be expected, to sink or to strand, where effective measures to assist the ship or any property in danger are not already being taken”).

110. *Id.* art. 3(2).

clear Damage Conventions<sup>111</sup> or the Bunker Convention. Furthermore, the shipowner is permitted to limit his liability under applicable national or international regimes for limitation of liability, such as the 1976 LLMC.<sup>112</sup>

In the past few years, wreck removal revenues for salvors have overtaken their LOF revenues. A series of standard contracts have been developed by the industry for the performance of wreck removal services, such as the BIMCO WRECKFIXED (Fixed price – “No cure no pay”),<sup>113</sup> WRECKSTAGE (lump sum – stage payment) and WRECKHIRE (daily hire) contracts. Notably, wreck removal as the aftermath of maritime casualties normally happens following unsuccessful salvage services. However, the wreck removal revenue does not provide a solution to the problem of environmental salvage for the following reasons: first, the increase in wreck removal revenue was due to the demand of national authorities following some major maritime casualties such as the *Costa Concordia* disaster in 2012.<sup>114</sup> In 2020, this income decreased by 65% compared to 2019.<sup>115</sup> Therefore, the wreck removal revenue would not contribute much to ease the salvage indus-

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111. See Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982 and by the Protocol of 12 February 2004, *done* July 29, 1960, [https://www.oecd-nea.org/jcms/pl\\_24768/unofficial-consolidated-text-of-the-paris-convention-as-amended-by-the-2004-protocol-nea/nlc/doc-2017-5/final](https://www.oecd-nea.org/jcms/pl_24768/unofficial-consolidated-text-of-the-paris-convention-as-amended-by-the-2004-protocol-nea/nlc/doc-2017-5/final); Vienna Convention on Civil Liability for Nuclear Damage, *concluded* May 21, 1963, 1063 U.N.T.S. 265.

112. See Convention on Limitation of Liability for Maritime Claims, *concluded* November 19, 1976, 1456 U.N.T.S. 221.

113. The services are rendered under the principle of “No Cure – No Pay” with a fixed price for the payment. Clause 4 of BIMCO WRECKFIXED 2010 provides that “[t]he Fixed Price stated in Box 9 is based upon the Nature of the Services, as set out in Box 7, Method of Work, and Personnel, Craft and Equipment, as set out in Annexes I and II, and the Description, Specifications, Position, Condition of the Vessel and the Worksite, as set out in Boxes 4, 5 and 6.” *WRECKFIXED 2010: International Wreck Removal Service Agreement (Fixed Price – “No Cure, No Pay”)*, BIMCO (2010), <https://www.bimco.org/contracts-and-clauses/bimco-contracts/wreckfixed-2010#>.

114. *Wreck Removal*, INT’L SALVAGE UNION, <https://www.marine-salvage.com/overview/wreck-removal/> (last visited Nov. 11, 2022). On 3 January 2012, the cruise ship *Costa Concordia* with more than 4,000 passengers and crew ran aground and 32 people were killed. See *Costa Concordia Captain Schettino Guilty of Manslaughter*, BBC (Feb. 11 2015), <https://www.bbc.com/news/world-europe-31430998>.

115. ISU ANN. REV. 2020, *supra* note 42, at 6.

try's economic pressure and would not meet the assumption that it would provide adequate incentives for salvors to invest in environmental emergency response. Second, as wreck removal usually requires the mobilization of some of the world's largest salvage fleet, there is a danger that less equipment would be put in station for emergency responses, and, consequently, less capacity for environmental emergency in maritime casualties would be available.<sup>116</sup> Last but not the least, the WRC 2007 was drafted as a separate regime alongside the salvage regime. This separation means that the rules of the WRC 2007 do not apply to salvor's environmental services if they are considered as salvage services.<sup>117</sup>

##### 5. LAW AND ECONOMICS FRAMEWORK

Based on the specific features of environmental salvage (described in 3) and the difficulties experienced with the current regulation of environmental salvage (analyzed in 4), this paper will now examine whether the law and economics framework can contribute to design an efficient mechanism for environmental salvage. The advantage of the law and economics framework is that it strongly focusses on how particular legal and financial arrangements affect the incentives of the stakeholders involved. Moreover, adopting cost-benefit analysis, the law and economics framework equally allows verification of the cost effectiveness of particular measures. In a law and economics framework, legal institutions are analyzed on their capacity to reach particular societal goals whereby first an abstract "model" (usually mathematical but sometimes also abstract) is formulated, sketching how particular legal rules could provide incentives to reach specific societal goals. This law and economics framework is worked out in an abstract, theoretical manner or, in other words, irrespective of the applicable legal rules in a particular jurisdiction. That framework is also how this paper will now proceed: given the challenges presented by environmental salvage and the specific characteristics,

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116. This is referred to by Landes & Posner as the "substitution effect." See Landes & Posner, *supra* note 6, at 120-22.

117. WRC 2007, *supra* note 104, art. 11(2) ("To the extent that measures under this Convention are considered to be salvage under applicable national law or an international convention, such law or convention shall apply to questions of the remuneration or compensation payable to salvors to the exclusion of the rules of this Convention.").



this text will outline what societal goals should be achieved by a legal framework, and then it will indicate which type of legal rules could be put in place to achieve those goals.

The difficulty for this topic is that the intervention to prevent damage to the environment occurs within the framework of a salvage operation and is therefore referred to as “environmental salvage.” However, it may be clear that actions to prevent (further) environmental harm to the marine environment can equally be undertaken irrespective of any salvage operation. This paper will, therefore, take a broader perspective and generally address which payment structure is suitable to provide desirable incentives to parties to prevent harm to the marine environment, which is also outside of the specific context of salvage.

In that respect, it is important to stress that actions aiming at preventing environmental harm could roughly be taken at three different stages. The first stage is *ex ante*, i.e., before any environmental emergency has occurred.<sup>118</sup> *Ex ante* preventive actions are generally all-care measures that stakeholders could engage in to prevent environmental harm from occurring. The second type of actions concern the *ex post* mitigation immediately after the emergency has occurred. This type is the case where *ex ante* prevention has failed, there has been an incident (such as a ship in distress) and actions are taken to further mitigate environmental harm or prevent environmental harm from occurring in the first place. Note that it is not always easy to make a distinction between care measures on the one hand and *ex post* mitigation on the other and the distinction between them is not always clear-cut. The third type of actions concern the so-called *ex post* recovery. Those actions take place in a later phase when the emergency relief measures have not been able to remedy (completely) the environmental harm and actions are still necessary to protect the marine environment in the long term. This recovery could, for example, consist of removing a wreck that could still cause environmental harm from the ocean, but it usually takes place at a later stage after the incident has occurred. The type of actions in which the salvors engage (referred to as “environmental salvage”) usually focus on the second type of actions, i.e., those taking place after an inci-

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118. See Giuseppe Dari-Mattiacci & Michael G. Faure, *The Economics of Disaster Relief*, 37 *LAW & POL'Y* 180, 184 (2015), for this distinction.

dent has arisen and emergency measures are necessary to prevent (further) environmental harm. It is important to take this distinction between those various actions into account.<sup>119</sup>

### 5.1 *Goals and principles*

The goal to be achieved from society's perspective should obviously be, in the first place, that the environmental emergency is prevented. In that respect, the classic economic literature on instrument choice can be employed to indicate that, for these environmental risks, safety regulation should be the primary choice; liability rules only play a role to supplement particular lacuna in safety regulation.<sup>120</sup> That literature clearly underscores the need to have safety regulation in place to prevent the environmental emergency in the first place. However, there may be a variety of reasons why safety regulation cannot optimally prevent environmental incidents. As a result, liability rules are equally important to supplement safety regulation, both for prevention and to compensate for the harm that may occur.

Society is obviously confronted with a situation where, notwithstanding optimal prevention (or in the case of insufficient prevention), an incident occurred.<sup>121</sup> So, now the question arises of how to deal with the environmental emergency from an *ex post* perspective, i.e., when the environmental risk or danger manifests itself or when the environmental emergency (for example hazardous substances leaking out of a ship) starts and the question arises of how incentives can be provided to deal effectively with the (threat of an) environmental emergency. The answer provided by law and economics is that the obligation to take care of the environmental emergency should be imposed on the party who can affect the accident risk. In terms of Guido Calabresi, that party

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119. *See id.*

120. *See* Steven Shavell, *Liability for Harm Versus Regulation of Safety*, 13 J. LEG. STUD. 357 (1984). *See* MICHAEL G. FAURE & ROY A. PARTAIN, ENVIRONMENTAL LAW AND ECONOMICS: THEORY AND PRACTICE 182-210 (2019), for a summary.

121. Note that, from an economic perspective, safety regulation should aim at optimal standards of prevention, weighing marginal costs and marginal benefits. Even if optimal preventive measures are employed, an accident-causing harm could still occur.

would be considered as the “cheapest cost avoider.”<sup>122</sup> From that perspective, it makes sense to impose the obligation to prevent the environmental emergency on the actor who was in the best position to prevent the harm from an economic perspective. Usually, this will be the shipowner because they may have the best information and would be in the best position to adopt a correct activity level. However, in particular cases, it might be a bareboat charter for example. The shipowner should therefore be seen broadly as the actor who uses and controls the ship. The ideal and first best situation is, therefore, that it is the shipowner who equally finances the environmental salvage. The idea behind this position is that if the shipowner being exposed to the costs of environmental salvage would provide an *ex ante* incentive of the shipowner to invest in measures to prevent the environmental emergency from occurring in the first place. This potential is why an exposure to liability remains important notwithstanding the existence of safety regulation. Liability can thus exercise a supplementary deterrent effect. This paper contends that the first and best solution—as far as financing the environmental salvage is concerned—consists in making the shipowner liable and providing financial guarantees to deal with its potential insolvency (5.2); as a second-best solution, public authorities should intervene only in a case where the liable polluter could not be identified or does not respond (5.3). Once the stakeholder who will demand (and finance) the environmental salvage is identified, the question arises as to which payment model can provide incentives for cost effective intervention in case of the emergency (5.4). The first and best solution in that respect consists of *ex ante* efficient bargaining (5.5). Only when that solution is not possible (given prohibitive transaction costs), may dispute resolution *ex post* play a role as a second-best solution (5.6).

### 5.2 *Best: financing by the liable polluter/shipowner*

The traditional answer provided in law and economics for this type of situation is that a strict liability rule should be prescribed and imposed upon the liable polluter. Assuming that the damage originated from a ship, this polluter would be the shipowner. The economic rationale is that a strict liability rule would provide in-

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122. See GUIDO CALABRESI, THE COSTS OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS 143-152 (1970).

centives to the shipowner both to take optimal prevention but also an optimal activity level.<sup>123</sup> It is also for that reason and not surprising that many international conventions—for example, related to damage caused by oil or by hazardous and noxious substances (HNS)—have all provided for a strict liability regime.<sup>124</sup>

Moreover, the strict liability regime should, in principle, also be unlimited. In other words, there should not be any financial caps. The logic is that a financial cap would lead to a situation where the victim's rights to full compensation would be jeopardized. Moreover, there would be no full internalization of the externality as the shipowner would then only take the care level necessary to avoid an accident equal to the statutory limited amount.<sup>125</sup> A financial cap could therefore lead to under-deterrence.<sup>126</sup> Whether that is, in practice, a major problem depends on the stringency of safety regulation and the effectiveness with which the safety regulation has been enforced.<sup>127</sup>

However, there could equally be a problem if the shipowner did not have sufficient funds to compensate for the harm. Such an insolvency problem (also referred to as a judgment proof problem) could lead both to under-compensation and under-deterrence.<sup>128</sup> Those potential outcomes are the reason why the literature suggests that the strict liability should be combined with mandatory solvency guarantees (such as compulsory liability insurance) to deal with the judgment proof problem.<sup>129</sup>

In principle, a model of (unlimited) strict liability with a mandatory solvency guarantee (obviously limited to an insurable

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123. Shavell, *supra* note 120, at 11.

124. See HNS Convention, *supra* note 103, art. 7; see also *International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS)*, INT'L MAR. ORG., <https://www.imo.org/en/About/Conventions/Pages/International-Convention-on-Liability-and-Compensation-for-Damage-in-Connection-with-the-Carriage-of-Hazardous-and-Noxious-.aspx> (last visited Nov. 11, 2022).

125. FAURE & PARTAIN, *supra* note 120, at 165.

126. Michael G. Faure & Hui Wang, *Financial Caps for Oil Pollution Damage: A Historical Mistake?*, 32 MAR. POL'Y 592, 601 (2008).

127. *Id.*

128. See generally S. Shavell, *The Judgment Proof Problem*, 6 INT'L REV. L. & ECON. 45 (1986).

129. See, e.g., Peter J. Jost, *Limited Liability and the Requirement to Purchase Insurance*, 16 INT'L REV. L. & ECON. 259 (1996).

amount) could lead to optimal deterrence and compensation and would thus, in principle, enable the polluter to pay for the environmental salvage. As it is the polluter who pays, this model would equally serve the polluter-pays-principle.

### 5.3 *Second-best: no liable polluter*

There may be situations, however, where it would be impossible to identify a solvent polluter. Various scenarios are possible. It could be that, for example, toxic waste has been dumped in barrels that find themselves on the bottom of the sea, but it remains impossible to identify the owner of the barrels and thus the (presumably) liable polluter. In most scenarios where a ship is the source of the pollution, a legal obligation would be in force in which the shipowner would be liable and would have to show solvency guarantees. However, it could be that there are particular jurisdictions where such an obligation is not applicable or where the damage is caused by a substance for which such a duty was not applicable. If the shipowner could, in that hypothesis, be identified but is insolvent, it might be impossible to impose the duty to prevent further environmental harm (and thus the corresponding duty to pay) upon the liable polluter. In that hypothetical scenario, the best solution is, in other words, simply not feasible. To the extent that serious damage threatens the environment, public authorities (for example, a port authority where vessels with a harmful content have been found) would then be the party demanding the emergency action.

To the extent that there is nothing to be salvaged (as in the case of dumped barrels with toxic waste), the actions to prevent further environmental harm would take place outside of any salvage operation. One could equally think about maritime casualties occurring on high seas (where also no public authorities are involved) or the situation where there was a salvage operation but the costs exceed the value that could have been salvaged. As a result, the shipowner would not engage with salvage and would leave the ship as a wreck.

In that situation, it is difficult to respect the polluter-pays-principle as this is only possible when a liable polluter can be identified. If that is not the case, financing could take place either from general tax payers financing the public authority or via a levy on the activity that gave rise to the harm. If, for example, the

barrels of the unidentified owner contained oil, financing could take place through a levy on all oil-receiving facilities within that particular harbour. Theoretically, the levy could also be imposed on oil companies who are outside the jurisdiction of the particular country. However, such an extraterritorial application may lead to huge administrative costs and collection problems. It would almost require an international convention as a basis to collect these funds. Staying within a domestic example, the levy on all oil companies would have the advantage (compared to a payment through the general taxes) that at least the activity that gave rise to the damage contributed to the fund (used to finance the environmental salvage). Ideally, that scenario could incentivize the contributors to the fund (the oil companies) to partake in a mutual monitoring because the company who illegally dumped the barrels would in fact benefit from the levies paid by all others. The collection of levies from the companies engaged in the same activity as the source of the harm could therefore still have an incentivizing effect, potentially leading to prevention.<sup>130</sup> That process is at least to be preferred to compensation via general taxation because that approach would not have any positive incentivizing effect.<sup>131</sup>

After having discussed the party from whom the demand for environmental salvage may come (and the way in which it would be financed), this paper will now turn to the supply side and the determination of an efficient contract for environmental salvage.

#### 5.4 *Prelude: which payment model?*

The first question is if the demand side (shipowner or public authority) were able to freely negotiate with the supply side (the salvor), to which type of payment mechanism might they agree to given the features of environmental salvage mentioned in the previous section and more particularly the high degree of uncertainty concerning the dangers and risks involved in the salvage operation.

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130. Michael G. Faure & Ton Hartlief, *Compensation Funds Versus Liability and Insurance for Remedying Environmental Damage*, 5 REV. EUR. COMPAR. & INT'L ENV'T L. 321, 323 (1996).

131. Compare Richard A. Epstein, *Catastrophic Responses to Catastrophic Risks*, 12 J. RISK & UNCERTAINTY 287 (1996), with Louis Kaplow, *Incentives and Government Relief for Risk*, 4 J. RISK & UNCERTAINTY 167 (1991).

Roughly there are two different models: on the one hand, the NCNP model that is traditionally used in salvage, and on the other hand, a payment related to the compensation for the expensive machinery to be used as well as the work done (payment for services). The NCNP model has been discussed at length in the economic literature with respect to payments for legal services and is also referred to as a contingent or conditional fee arrangement. In other words, the payment to the contractor in that particular case is dependent upon reaching a particular result. The differences between a contingency-based system and a payment for services (for example an hourly fee system) have been described in a detailed way in the law and economics literature with respect to payments for lawyers.<sup>132</sup> This literature also has interesting insights about the more general question of the optimal payment system for particular services. The relationship between the party demanding the service (in this case the shipowner or a public authority) and the party providing the service (the salvor) can be qualified as a principal-agent situation. The feature of such a principal-agent relationship is that the principal will ask the agent for a certain performance, but the interests of the principal and the agent may not always align.<sup>133</sup> To put it more simply, the agent may wish to execute the service with the lowest efforts possible but still gain the highest reward. One way of making sure that the interests of the agent are better aligned with the principal's is the payment system. A major argument in favour of a contingency fee arrangement (which could be NCNP) is that the agent would spend their best efforts to perform the services as their payment will ultimately depend upon the success. In a system where the agent is simply paid for the service provided, there is a danger that the agent may overcharge either by spending more hours than necessary (in case they would be paid by the hour) or by providing lower-level quality. However, the law and economics literature has equally indicated that, in fact, there are no major

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132. See, e.g., Hugh Gravelle & Michael Waterson, *No Win, No Fee: Some Economics of Contingent Legal Fees*, 103 *ECON. J.* 1205 (1993); Thomas J. Miceli & Kathleen Segerson, *Contingent Fees for Lawyers: The Impact on Litigation and Accident Prevention*, 20 *J. LEGAL STUD.* 381 (1991).

133. See generally Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 *J. FIN. ECON.* 305, 308 (1976) (discussing the principal-agent theory).

differences between either a contingency fee or a payment for services system as long as the principal is able to control the quality of the services provided by the agent.<sup>134</sup> If there were information asymmetries and the principal would not be able to adequately control the agent, a payment for services would have the major disadvantage that the agent could shirk or steal without the principal being able to discover such activities. Information asymmetry is a major argument in favour of a contingency fee arrangement because it has the advantage that the agent's reward also depends upon the success of the service. In that case, the incentives of the agent and principal are better aligned even if the principal might not be able to control the efforts of the agent. However, in that particular case, the agent will act as a gatekeeper for the simple reason that the risk has been transferred to them. A case of (environmental) salvage would imply that the salvor, as a gatekeeper, would have to make an accurate assessment of the risks involved in the operation to determine an appropriate success fee or percentage of the proceeds in case of NCNP. That situation implies high information costs on the side of the agent (who, in this case, would be the salvor).

In the case of property salvage where an object of value can be saved by the salvage operation, an NCNP arrangement may make sense; it does allow the salvage to take place, and the risk level of the operation can be translated by the salvor in the assessment of the value of the proceeds that could be recovered as a result of the salvage. However, those arguments do not apply to the same extent in the case of environmental salvage. First of all, there are simply no objects of value to be recovered in an environmental salvage; only harm to the environment is prevented. Second, the risk assessment *ex ante* may be particularly difficult in case of environmental salvage. In a pure NCNP model (or even one with a modest success fee), as a result, there might be few incentives from the side of the salvor to engage in the operation in the first place. One could therefore predict that few salvors in an NCNP model would have incentives to engage in the operation, which

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134. See generally Michael G. Faure et al., *No Cure, No Pay and Contingency Fees*, in *NEW TRENDS IN FINANCING CIVIL LITIGATION IN EUROPE: A LEGAL, EMPIRICAL, AND ECONOMIC ANALYSIS* 33 (Mark Tuil & Louis Visscher eds., 2010) (summarizing the literature).



would create negative consequences for social welfare. Third, the main reason for generally preferring a contingency fee arrangement, which lacks information on the side of the principal, may not be applicable in the particular case of (environmental) salvage. Generally, the principal (shipowner or public authority) is not necessarily in a worse position to assess the risk involved in the environmental salvage than the agent (the salvor). So, the reason for having a contingency fee rather than a payment for services arrangement is therefore not present either. Summarizing, there are not many reasons why a payment structure based on NCNP would be chosen for a typical case of environmental salvage.

The question of the optimal payment for salvage was also analyzed by Friedman, writing about “[b]argaining on a [s]inking [s]hip.”<sup>135</sup> Friedman argues that there are in essence two optimal prices for salvage: when looking at the incentives for the salvor (having enough capacity to save ships in distress, look out for ships with problems etc.), the socially optimal price consists of the full value of the salvaged property.<sup>136</sup> A salvor should invest as long as the marginal costs of this investment are lower than the marginal benefits (which is the saved property). Any price lower than this implies a positive externality (for the shipowner) that could lead to a lower activity level of the salvor.<sup>137</sup> When looking at the incentives of the shipowner (for example when deciding to send a ship into the storm or not), however, the correct price for salvage should be the marginal costs of salvage.<sup>138</sup> Any price higher than this implies a positive externality for the salvor and hence a too low activity level for shipowners.<sup>139</sup> The actual price should therefore strike a balance between these two possible prices.<sup>140</sup>

### 5.5 *Best: efficient bargaining ex ante*

How, then, would the contractual relationship between the salvor and the demand-side (shipowner or public authority) take place? In the ideal case, when the environmental emergency (or

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135. DAVID D. FRIEDMAN, *LAW'S ORDER: WHAT ECONOMICS HAS TO DO WITH LAW AND WHY IT MATTERS* 153-156 (2000).

136. *Id.* at 154.

137. *Id.*

138. *Id.*

139. *Id.*

140. *Id.* at 155.

threat thereof) emerges, a bargaining between both parties would take place *ex ante*, i.e., before the environmental salvage operation starts. Taking into account what has just been mentioned in the previous subsection, parties will then determine a price, which would be either an NCNP arrangement or (much more likely) a price arrangement whereby either an hourly fee is determined or a fee for the type of services performed (which can incorporate a payment for the materials used by the salvor).<sup>141</sup>

As in this particular case it can be presumed that both parties are informed and one is not necessarily in a weaker bargaining position, it could be an example of efficient Coasean bargaining whereby parties would reach an efficient outcome.<sup>142</sup> If those conditions are met, the efficient result will follow, and there is not necessarily a reason for the law to intervene.

However, there may be reasons why that efficient bargaining (whereby parties mutually agree on the services and the price) will not always take place. A first problem is simply a practical one: in some cases, time is of the essence and there may be such an emergency that the time for efficient bargaining may simply be lacking.<sup>143</sup> Traditionally, the master of the ship signed the salvage agreement with the salvor on behalf of the shipowner and the cargo owners. The reason for that process was that the shipowner and others would have no means of examining the exact problem with the ship. The master was therefore considered as the “agent of necessity,” having the authority to conclude the contract for salvage operations on behalf of the owner of the vessel and the other property on board of the vessel. Thanks to increased communication technology, the shipowner is now able to obtain more timely information when a vessel is in distress, which equally allows the shipowner to make decisions and engage with the salvors concerning the salvage services. Still, many decisions will have to be taken without having adequate information, and unpredictable events may endanger the salvage operations. Another problem is

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141. *Id.*

142. See generally R. H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960).

143. As Friedman indicates in *LAW'S ORDER: WHAT ECONOMICS HAS TO DO WITH LAW AND WHY IT MATTERS*, there is no reason to expect an efficient price to result from bargaining as “[t]he bargaining occurs when the ship is sinking and the tug has already shown up.” FRIEDMAN, *supra* note 135, at 155.

that the agent may find itself in a situation of distress, needing to find a rapid solution for the (threat of an) environmental problem and having very few options. This situation may de facto amount to a so-called situational monopoly, especially since the number of potential salvors on whom the principal could call could be very limited. In cases of environmental disasters, the size of the catastrophe can be substantial as a result of the number of potential salvors able to respond in a timely manner is reduced. That scenario could equally jeopardize efficient bargaining, especially in combination with the time pressure. A third element potentially complicating the bargaining is that, more particularly, in the situation where a shipowner might be liable for paying the environmental salvage (see 5.2), it may not ultimately be the shipowner itself that picks up the bill, but rather a third party providing a solvency guarantee. Such a third party could be, for example, an insurer.<sup>144</sup> Again, the intervention of this third party may provide additional difficulties in the negotiations with the salvor.

For that reason, it may be that parties could call on a document that simply fixes the general principles of, on the one hand, the efforts to be taken by the salvor and, on the other hand, the price to be paid *ex post* by the principal. In theory, transaction costs could be reduced by agreeing on a general model that, for example, determines the way of calculating the price due *ex post* but reduces the need for detailed *ex ante* bargaining (which may be impossible given time pressure and a situational monopoly as explained in section 3).

#### 5.6 *Second-best: dispute resolution ex post*

Of course, the ideal is an *ex ante* (before the environmental salvage takes place) determination of the work to be done and the price to be paid. That approach can reduce potential conflicts *ex post* and provide clear information to the parties involved on mutual expectations. For the reasons just mentioned, however, this “best” solution (efficient bargaining) may not always occur. Such an event means that *ex post* dispute resolution may well be necessary. Theoretically, parties will then have to determine after the services have been performed (assuming a payment for services

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144. Or in the particular maritime case, a so-called Protection & Indemnity Club (P&I Club).

model applies) how much the principal would have to pay to the salvor. Again, this process of *ex post* determination can be facilitated if *ex ante* a payment structure has been determined. If that is not the case, there is a risk that parties may disagree and litigation will be necessary. Obviously, that could lead to relatively high costs, and a cost-effective alternative dispute resolution mechanism would have to be chosen to determine the appropriate compensation for the salvor. Especially since this is a highly technical and complicated area, there is a great likelihood that information costs for general courts will be extreme. Those costs may be a reason to move to an alternative form of dispute resolution such as, for example, arbitration where arbitrators may be selected in such a way that they have an information advantage concerning particular maritime environmental issues, which could lead to a more rapid decision-making at least in theory. However, law and economics literature has indicated that arbitration in practice is not as “quick, cheap and good” as it is often portrayed in theory.<sup>145</sup> Furthermore, the parties involved lack incentives to reveal the settlements, the results of arbitration or other out-of-court dispute resolution mechanisms.<sup>146</sup>

### 5.7 Summary

A summary of the economic perspectives just presented would lead to the following main points:

- If there is a liable polluter that can be identified, that polluter should, in principle, be exposed to the costs of the clean-up in order to provide correct incentives for prevention. In the case of marine pollution, this liable polluter will often be a shipowner.
- A strict liability rule might be imposed in combination with mandatory solvency guarantees. There should be no financial cap on the liability.

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145. See Michael G. Faure & Wanli Ma, *Investor-State Arbitration: Economic and Empirical Perspectives*, 41 MICH. J. INT'L L. 1, 40 (2020).

146. Indeed, an important disadvantage of dispute resolution via mediation or arbitration is that it may be optimal for the parties, but it does not generate the positive externalities that follow from court precedents as arbitrators will not have any incentive to contribute to the development of the law as such.

- If no polluter can be identified or held liable, public authorities might demand a clean-up.
- In the case of environmental salvage, an NCNP or another contingency fee system may make little sense as there are no proceeds on which a fee can be calculated. Moreover, the party demanding the environmental salvage (shipowner or public authority) might have good information to monitor the performance of the salvor.
- The need for rapid decision-making and a situational monopoly may limit the possibilities of efficient *ex ante* bargaining (before the environmental salvage takes place).
- Given the potential high transaction costs, parties may *ex ante* prefer to agree on general principles concerning the services to be performed by the salvor and the payment made. Such a model agreement could reduce transaction costs in the case of an environmental emergency.
- *Ex post* (after the environmental salvage) parties could bargain (taking into account the general principles agreed upon *ex ante*) to determine the fee for the environmental service.
- If such a bargain is impossible or does not lead to the desired result, a dispute resolution mechanism has to be followed that allows decision-making by specialized expert decision-makers in order to lower the administrative costs of dispute resolution. Out of court dispute resolution mechanisms like arbitration, mediation or ADR might serve that goal.

## 6. ANALYSIS

### 6.1 *Confusion*

The current debate concerning environmental salvage does not seem to advance and, to some extent, one can understand this as the concept of salvage is, to an important extent, not compatible with the idea of paying for mitigating the risks of environmental emergencies. Salvage is by definition a service that confers a bene-

fit by saving or helping to save a recognized subject of salvage; i.e., usually the ship or property. As a result, the payment structure is NCNP as there would always be something to recover in the case of salvage. If, however, investments are made to prevent (further) environmental harm, there is no property to salvage (no proceeds) and only costs that are avoided. In that sense, environmental salvage is indeed, as the paper's title suggests, an oxymoron. From an environmental perspective, investments should be made to prevent (further) environmental harm. From an economic perspective, it can be added that these investments should only be made when the marginal costs of preventive actions are lower than the marginal benefits in reducing the environmental risks. That situation corresponds to the traditional incremental Learned Hand formula. This is a formula developed by an American judge (Learned Hand) in a well-known case to decide whether negligence exists or not (if the burden of precaution was lower than the probability multiplied with the loss).<sup>147</sup> Brown (1973) indicated that, for efficiency, marginal costs of prevention would have to be compared with marginal benefits;<sup>148</sup> this approach is referred to as the incremental Learned Hand formula.<sup>149</sup> Theoretically, the cost-benefit analysis based on the incremental Learned Hand Formula is undoubtedly clear, but the problem may obviously be that especially calculating the (environmental) benefits (in reduced risks) may be extremely difficult when, under the pressure of an emergency, the decision has to be made whether to engage in these costs or not.

As environmental salvage is an oxymoron, the question becomes how efficient payment structures can be developed to provide incentives to take cost-effective preventive measures in the case of an environmental emergency. The logical best solution would be to analyze the efforts for preventing (further) environmental harm in case of an emergency irrespective of the concept of salvage. The different maritime concepts (such as salvage, law of find, wreck etc.) only lead to additional confusion. That confusion is why we analyzed in the previous section the optimal construc-

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147. John Prather Brown, *Toward an Economic Theory of Liability*, 2 J. LEG. STUD. 323, 332 (1973).

148. *Id.*

149. *See id.* at 323.

tion of actions to prevent (further) environmental harm in case of emergency (also) from the hypothesis that there is absolutely nothing to salvage (for example, the case of toxic waste barrels found in the ocean). In that hypothesis, the economic principles as sketched out in the previous section could be fully applied to determine an efficient solution to incentivize the parties involved to take cost-efficient measures. That scenario would, from a principle and theoretical manner, be an argument to consider the environmental protection actions as totally separate from the traditional (property) salvage. As such, that approach would have the advantage of keeping the debate clear and also developing a separate solution for the action taken by a salvor to prevent (further) environmental harm. In that respect, one could argue that the environmental services are just incidentally provided by the salvors who happened to be present at the place where the environmental emergency occurs because they are the “first responder” to environmental disasters; moreover, they are usually also the only ones to have the capability to provide such services. If we analyze the past debate as well as the proposals concerning environmental salvage from this relatively simple and straightforward perspective, it would imply that the economic principles concerning contract formation and payment for the environmental services identified in the previous paragraph should be applied separately to the environmental services. In that respect, it would just be considered accidental that environmental services in salvage operations and salvage services are performed by the same salvor. This paper will now review some of the consequences of this, admittedly, revolutionary position.

### *6.2 Current status and reform proposals of the NCNP model*

As the overview in section 4 made clear, the parties have been conditioned to rethink environmental salvage within the traditional model of NCNP. This conditioning may be explained by path dependency, but it obviously constitutes an important limitation in reaching the type of wealth-maximizing solutions laid out in the previous section.

For example, the reform of the LOF 1980, where environmental salvage was considered for the first time, referred to a compensation for reasonably incurred expenses plus a maximum of 15%, but it only aimed to ensure the salvors would be reimbursed if

their service failed to save property but succeeded in pollution reduction. Furthermore, the vessel in such a case must be a laden, or partly laden, oil tanker. For many cases, that may not be a useful solution. After all, the salvage reward under a LOF 80 salvage agreement is still restricted to the NCNP model. There can be many cases where there are not enough proceeds to salve, but the salvor still could take action to prevent further environmental harm. Given the high upfront investments in material, merely recovering reasonable expenses incurred plus maximum 15% will obviously not provide incentives to salvors to take the desirable cost-effective environmental prevention measures.

The same can be said about the solutions adopted in the 1989 Salvage Convention. Article 13 is still completely framed within the NCNP model and therefore supposes that there are positive proceeds salvaged from which the salvor can be paid for its environmental efforts. Under specific conditions, Article 14 can allow for special compensation—even up to 100% of the salvors' expense—but this 100% increment has never been used in LOF arbitration.<sup>150</sup> The House of Lords *Nagasaki Spirit* decision, however, subsequently held that the special compensation may not contain an element of profit. In the light of the high upfront investments to be made by (just a few) salvors, it is clear that the consequences of this case law is that incentives for taking cost-effective environmental emergency measures by salvors will be lacking. The House of Lords completely neglected the economic insight that salvors should be able to make a profit in order to compensate for the very high upfront investments and for the high level of uncertainty. This situation concerns not only the fact that the expensive material will only have to be used in exceptional circumstances but also the many unforeseeable and unpredictable events that may emerge during the salvage operation that may result in the salvor being confronted with unexpected cost increases. The same criticism applies to the SCOPIC. The only advantage of this model is that it, for the first time, provides a deviation from the NCNP model with a calculation method for salvor's expenses, i.e., a tariff and fixed bonus at 25%, but it only provides remuneration for the

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150. In fact, the 30% is the point at which the LOF arbitrators would pause for thoughts and not to be exceeded except in the most serious case. See Bishop, *supra* note 7, at 71.



prevention of pollution or removal of pollutants in the immediate vicinity of the vessel, implying those prevention actions should be a necessary part for the proper execution of the salvage operation with saving the property as the central focus. It is therefore not clear whether it will provide sufficient incentives to salvors to engage in highly risky and potentially costly environmental rescue operations.

### 6.3 *Alternatives*

As the current payment structure apparently provides insufficient incentives to salvors and no agreement has been reached with respect to the reform proposal, some “out of the box” thinking, learning from the insights of law and economics, may be necessary. From society’s perspective, it is clear that as long as cost-efficient preventive measures can be taken in the case of a maritime environmental emergency, a contractual and financial structure has to be worked out, including a payment structure, to provide incentives for these actions to be undertaken. The starting point should be that, as far as the preventive action towards reducing environmental risks is concerned, the NCNP model should no longer be applied. Brough argues that the departure from NCNP—i.e., the “safety net” in LOF 1980, Article 14 Special Compensation in the Salvage Convention 1989—may realign the interests of the salvors and any third parties in salvage operations who are exposed to the threat of pollution. That approach, however, did not work in practice, given the divergence of interests among the marine underwriters. Moreover, it does not seem to make any sense from a theoretical perspective to apply an NCNP model if there are no proceeds from which the costs can be recovered. A different payment model for these costs should therefore be found. Parties would ideally negotiate *ex ante* (as indicated in section 5.5) also on the reward that the salvor can obtain for preventing (further) environmental harm. However, it was equally indicated that, given the emergency and the substantial uncertainties, the possibilities of this *ex ante* bargaining may simply not be present. As already indicated by Landes and Posner, forcing parties to negotiate *ex ante* over low probability events will impose high contracting costs on the parties.<sup>151</sup> The alternative is to have the price for

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151. Landes & Posner, *supra* note 6, at 100-01.

the environmental action determined *ex post* via dispute resolution. That alternative, however, has the major disadvantage that, if parties can *ex post* not reach an agreement, costly dispute resolution may be necessary. An alternative would be to lower the transaction cost between the parties by determining (for example via guidelines to be developed via Lloyd's) various indicators related to the elements that will determine the reward for the salvor. These elements could specify, for example, the material and equipment needed by the salvor, the costs incurred by the salvor for engaging in the preventive action, the *ex-ante* assessment of the potential risks in the rescue operation, the extent to which the salvor has been able to prevent further environmental harm through its action) etc. Identifying these (and other relevant) elements *ex ante* in a guideline and clarifying the corresponding monetary compensation could guide the parties in their *ex post* determination of the reward to be paid. That approach equally eliminates the need for detailed *ex ante* negotiations. Moreover, to the extent that no agreement can be reached between the parties *ex post*, a low cost dispute resolution (such as mediation) could be sought. In that case, the mediator could attempt to bring the parties together on the basis of the guideline to which the parties agreed before the actions were undertaken.

#### 6.4 Implementation

As made clear above, it should, at least in theory, be possible to work out a framework on the basis of which a reward structure could be worked out, providing sufficient incentives to salvors for actions aiming at cost-effective prevention of (further) environmental harm. That framework equally has a clear social (and ecological) objective as well. Moreover, this structure can be applied irrespective of whether the preventive actions are taking place in addition to a traditional salvage or separately. In the latter case, it is obviously no longer useful to refer to a "salvor" as there is nothing to salvage in the first place, but only damage and costs to avoid. The attempts to reach a desirable solution have so far failed because of conflicts between the property insurers on the one hand and the liability insurers (P&I Clubs) on the other. The property insurers of the hull and cargo are liable for the payment of the salvage award for saving the property, and the P&I clubs (the insurers of the shipowner) are liable for pollution clean-up and

third-party damages.<sup>152</sup> Liu argues that “views regarding the adequacy of remuneration of salvors for providing environmental protection services are polarized,” and it is an issue which remains to be resolved through economic analysis.<sup>153</sup>

The problem is that solutions were never reached because the parties continued to consider solutions within the (in this paper’s view, confusing) concept of environmental salvage. A solution would be, first of all, to abandon this confusing concept and simply work out a general arrangement that provides incentives for cost-effective preventive action from what this paper still, for the moment, refers to as “salvors” whether that takes place within the framework of a salvage operation or not. Second, as this solution should be worked out generally (and thus irrespective from salvage), it should not be included in the currently negotiated frameworks such as LOF or SCOPIC as these still emerge within the framework of salvage. Third, given the opposing interests of the parties involved (and their insurers) and also given the high social interests in providing incentives to parties for cost-effective investments in prevention, a regulatory solution (i.e. a convention) seems necessary. Fourth, a separate convention should be worked out under the auspices of the International Maritime Organization (IMO) that deals specifically with the regulation and the compensation regarding actions aiming to prevent further harm to the maritime environment after emergencies with ships or other objects that potentially pollute the environment.

#### 7. CONCLUDING REMARKS

Marine accidents can cause great harm to the environment. There are often only a few specialized private companies, salvors, who are in a position to take cost-effective measures to reduce the impact of such an environmental emergency. For many decades, there have been debates on the question of how appropriate compensation for those efforts should be provided. As it is often salvors who engage in those activities, the solutions sought thus far were also within the framework of the concept of salvage. Both in contracts as well as in case law and in international conventions, attempts have been made to work out a solution for this problem

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152. Brough, *supra* note 15, at 104.

153. LIU, ENVIRONMENTAL PROTECTION SERVICES, *supra* note 35, at 204.

(LOF, Salvage Convention, SCOPIC), but the parties involved remain dissatisfied. This situation could potentially have dramatic results as it could lead to cost-effective measures not being taken and more environmental harm occurring in relation to marine accidents.

This paper has argued that the parties involved in the discussion were thus far too constrained within the traditional maritime law concepts like salvage even though there is obviously nothing to save in the environmental case. This text employed the economic approach to law to argue that an innovative approach is necessary, leaving the concept of environmental salvage behind and looking instead for effective solutions that could provide the right incentives to parties for desirable prevention.

Of course, one could easily go further by suggesting, for example, that governments rather than private parties should have the equipment to act in case of environmental emergencies or that an international compensation fund should be created to deal with the costs. However, this paper argues that in order to reach feasible solutions, it is important to make use of the existing expertise (with the salvors). Requiring many national governments to keep (very expensive) material available to deal with rare events does not seem to be a cost-effective solution. Creating a compensation fund, however, always sounds nice on paper, but that can equally be very complex. It is, however, clear that this fascinating domain of (what was called) environmental salvage is both legally and socially highly relevant and therefore undoubtedly merits further research.