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National Legal Models to Regulate Scrubbers Washwater

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Cover Page Footnote

Dr. Shams Al-Hajjaji is a postdoctoral research associate at The Walther Schücking Institute for International Law and coordinator of Ocean Justice Research and Training Group at the University of Kiel, Germany. He holds PhD from University of Luxembourg, LLM/ JSD from University of California Berkeley Law School. This article is a part of the ShiptTrase project and was funded jointly by Belmont Forum (USA) and the Federal Ministry of Education and Research (Germany). The author wish to thank Professor Nele Matz Luck, and the editors of Loyola of Los Angeles International and Comparative Law Review.

National Legal Models to Regulate Scrubbers Washwater

BY SHAMS AL DIN AL HAJJAJI*

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ABSTRACT

According to the findings of this study, nations should adopt uniform regulations regarding the discharge of washwater from exhaust gas cleaning systems into their ports, territories, and Exclusive Economic Zones. Scrubbers are used by ships to reduce their emissions of greenhouse gases so they can adhere to the International Maritime Organization's limit on the sulfur content of ship fuel. The global upper limit was 0.5% in January 2020. Scrubber washwater is discharged into the ocean by ships. Toxic substances are present in the washwater for the scrubbers. The level of washwater for the scrubbers is governed by the 2008 and 2015 Guidelines for the Exhaust Gas Cleaning Systems. Regarding the washwater from the scrubbers' effects on the marine environment and people's health, there still is some uncertainty. The national level is also affected by this uncertainty.

Currently, there are three main ways that nations implement policies for the use of scrubbers in their jurisdiction. First are nations like Egypt and Qatar, that have enacted outright bans on using scrubbers in their territorial waters. The second category consists of nations that only partially permit the use of scrubbers. Two different variations exist for this partial prohibition of scrubbers. First, nations restrict the use of scrubbers in specific internal water areas (Germany), or ports (Sweden and Finland). The second option for a partial prohibition (Argentina, China, and France) is to outlaw certain discharge and disposal methods involving open loops. The third and final category consists of countries that do not regulate the discharge of scrubbers. These nations either rely on the general legal regulations concerning ship pollution (Article 192-237 of the UNCLOS), or they adopt a complete permission standard for the discharge of scrubbers in their water.

There are three Parts to this research paper. In particular, the transboundary harm of the washwater from the scrubbers is discussed in the first Part of the essay, along with who is responsible for conducting the investigation. Three key players in the marine environment are recognized by the UNCLOS. These actors are the flag state, the port state, and the coastal state, and this Part includes a discussion of each of their functions. In light of the growing number of nations regulating scrubbers' washwater, it also discusses ways to harmonize their actions. The second Part covers the legal frameworks that the national regulatory body has adopted in relation to the washwater used by scrubbers. These four

models contrast limited and unlimited bans, specific and general regulations, and binding and non-binding regulations. The answer to the problem of uncertainty is covered in the third Part. Two answers to the impending scientific uncertainty and the adoption of uniform regulations are put forth in the research.

I. INTRODUCTION: INTERSECTION BETWEEN AIR AND SEA POLLUTION

This article urges states to adopt uniform rules for the discharge of scrubber washwater into their ports, territories, and Exclusive Economic Zone (“EEZ”). Scrubbers are used by ships to reduce their greenhouse gas emissions in order to adhere to the International Maritime Organization’s (“IMO”) limit on the sulfur content of ship fuel.¹ The world’s maximum allowed value was 0.5% in January 2020.² To comply with the new IMO standards, the shipping industry has three options:³ (1) alternative fuels, such as Liquefied Natural Gas (“LNG”), methanol, or electricity, can all be used by ships;⁴ (2) heavy fuel oil (“HFO”), which includes ultra-low sulfur fuel oil and low sulfur fuel, is also a fuel that ships can use;⁵ and (3) continued use of non-compliant fuel oil (high sulfur dioxide), but only if they install scrubbers.⁶

To continue using high levels of sulfur dioxide while adhering to the IMO’s new standards, shipping companies install scrubbers on their ships. While scrubbers work well to meet IMO and EU’s current standards for fuel sulfur content,⁷ there is scientific ambiguity surrounding the harm that scrubbers’ washwater may cause to the marine environment and to people’s health.⁸ Ships that use scrubbers release the scrubbers’ washwater into the ocean, which contains a variety of elements that the

1. Int’l Council on Clean Transp., *Global Scrubber Washwater Discharges Under IMO’s 2020 Fuel Sulfur Limit* (Apr. 2021), <https://www.theicct.org/sites/default/files/publications/scrubber-discharges-Apr2021.pdf>. [hereinafter *Global Scrubber Washwater Discharges*].

2. The Marine Env’t Prot. Comm. [MPEC], Res. 320 (74), *2019 Guidelines for Consistent Implementation of the 0.50% Sulphur Limit Under Marpol Annex VI* (May 17, 2019), <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Resolution%20MEPC.320%2874%29.pdf>.

3. Pei-Chi Wu & Cheng-Yuan Lin, *Cost- Benefit Evaluation on Promising Strategies in Compliance with Low Sulfur Policy of IMO*, 9 J. MAR. SCI. ENG. 3-6 (Dec. 22, 2020).

4. Julia Hansson et al., *Alt. Marine Fuels: Prospects Based on Multi-Criteria Decision Analysis Involving Swedish Stakeholder*, 126 BIOMASS AND BIOENERGY 1227-130 (2019) [hereinafter *Alt. Marine Fuels*]; see Julia Hansson et al., *The Potential Role of Ammonia as Marine Fuel-Based on Energy Systems Modeling and Multi-Criteria Decision Analysis*, 12 SUSTAINABILITY 3265, (2020) [hereinafter *Potential Role of Ammonia*].

5. ALEXEY BAKHTOV ET AL., HELCOM-HELSINKI COMM’N, ALTERNATIVE FUELS FOR SHIPPING IN THE BALTIC SEA REGION (2019).

6. Council Directive (EU) 2016/802 of the European Parliament and of the Council of May 11, 2016 Relating to Reduction in the Sulphur Content of Certain Liquid Fuels, art. 6, 2016 O.J. (L 132/58) 773 (EC).

7. *Id.* at 785.

8. Erik Ytreberg et al., *Effects of Scrubber Washwater Discharge on Microplankton in the Baltic Sea*, 145 MARINE POLLUTION BULL. 316, (2019).

IMO is still conducting additional scientific research on.⁹ This washwater contains toxic substances like trace metal pollutants, nutrients, and pH.¹⁰

The 2015 Guidelines for Exhaust Gas Cleaning Systems (“2015 Guidelines”) specify the required parameters for scrubbers’ washwater.¹¹ However, both the 2015 Guidelines and the earlier 2008 Guidelines compel states to update these caps.¹² According to the 2008 Guidelines, the criteria should be revised in the future as more data becomes available on the contents of the discharge and its effects.¹³ The main issue with these Guidelines is that, as can be seen below, they fail to indicate the severity of the infraction.¹⁴ The necessary level for air and water pollution from ships that use scrubbers is established by the 2008 and 2015 Guidelines.¹⁵ These regulations address two categories of scrubber pollution.¹⁶

Pollution of the air comes first.¹⁷ Scrubbers demonstrated an ability to meet the standards outlined in the 2015 Guidelines. The 2015 Guidelines lower the percentage of sulfur in fuel oil to 0.5 percent for emissions in non-control areas and to 0.1 percent overall¹⁸ for the areas used for emission control. The maximum limit for fuel oil sulfur content was set at 4.5 percent in the following table, and it was allowed to drop to 0.1 percent at the minimum.¹⁹ The table contains all the necessary information up to the current limits of 0 and 1 percent, and their corresponding ratio at 21 and 43.²⁰ In January 2020, this lower cap became operative.

9. *Id.* at 323.

10. JENS PETER HANSEN & ALFA LAVAL AALBORG, EXHAUST GAS SCRUBBER INSTALLED ONBOARD MV FICARIA SEAWAYS (Miljøstyrelsen, 2012), <https://www2.mst.dk/udgiv/publications/2012/06/978-87-92903-28-0.pdf>.

11. Marine Env’t Prot. Comm. [MPEC], Res. 259 (68), *2015 Guidelines for Exhaust Gas Cleaning Systems* (May 15, 2015), [https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.259\(68\).pdf](https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.259(68).pdf).

12. *Id.*; *See also* Marine Env’t Prot. Comm. [MPEC], Res. 170 (57), *2008 Guidelines for Exhaust Gas Cleaning Systems* (Apr. 4, 2008), [https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.170\(57\).pdf](https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.170(57).pdf).

13. MPEC Res. 170 (57), *supra* note 12, at 4.

14. *Id.*; *See also* MPEC Res. 259 (68), *supra* note 11, at 4.

15. MPEC Res. 170 (57), *supra* note 12, at 4; MPEC Res. 259 (68), *supra* note 12, at 4.

16. *Id.*

17. MPEC Res. 259 (68), *supra* note 11, at 4.

18. *Id.* at 2.

19. *Id.*

20. *Id.*

Table (1): Air-Sulfur Emission

Fuel Oil Sulfur Content (% m/m)	Ratio Emission SO ₂ (ppm)/ CO ₂ (%v/v)
4.50	195.0
3.50	151.7
1.50	65.0
1.00	43.3
0.50	21.7
0.10 (emission control areas)	4.3

The limits listed in the previous table have been demonstrated to be achieved by scrubbers. States have agreed to implement and comply with the required level of sulfur.²¹ Ships are able to do so with their current machinery operations, according to the 2019 Guidelines for Consistent Implementation of the 0.50% Sulfur Limit Under the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI.²² This change, however, faces some significant difficulties. These difficulties include internal leaks, the buildup of wax sediment, engine fuel starvation, and power loss.²³ The Guidelines urge States to take action.²⁴

The Guidelines distinguish between areas that are subject to emission controls and those that are not.²⁵ The Baltic Sea and Northern Sea in Europe, the east and west coastlines of the U.S. and Canada, the territorial

21. MPEC Res. 320 (74), *supra* note 2, at 1-4.

22. *Id.* at 6.

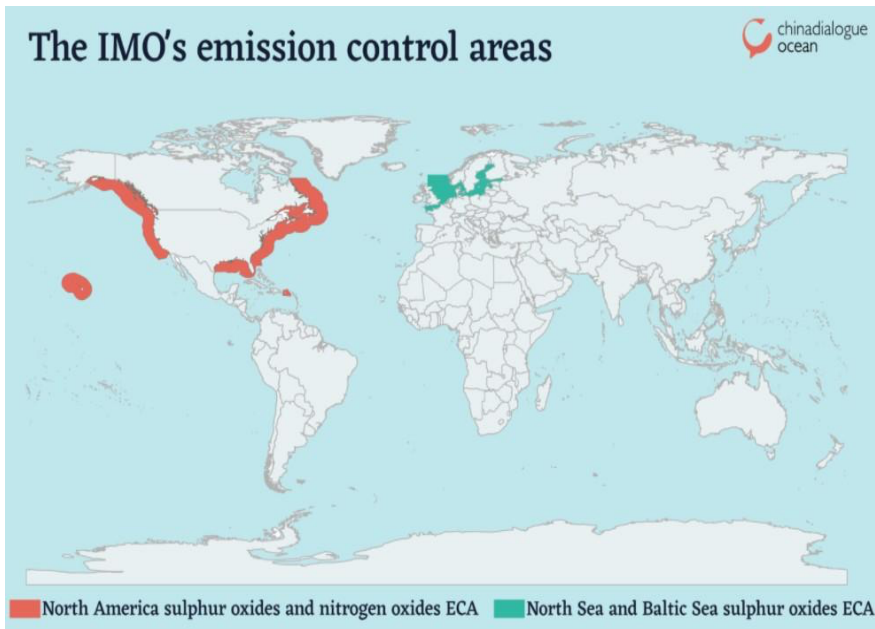
23. *Id.*

24. *Id.*

25. Marine Env't Prot. Comm. [MEPC], Res. 190 (60), *Amendments to the Annex of the Protocol of 1997 to Amend the International Convention for the Prevention of Pollution from Ships, 1973, as Modified by the Protocol of 1978 Relating Thereto* (Mar. 26, 2010); *see also* Int'l Maritime Org. [IMO], *Emission Control Areas (ECAs) Designated under MARPOL Annex VI*, [https://www.imo.org/en/OurWork/Environment/Pages/Emission-Control-Areas-\(ECAs\)-designated-under-regulation-13-of-MARPOL-Annex-VI-\(NOx-emission-control\).aspx](https://www.imo.org/en/OurWork/Environment/Pages/Emission-Control-Areas-(ECAs)-designated-under-regulation-13-of-MARPOL-Annex-VI-(NOx-emission-control).aspx) [hereinafter Emission Control Areas].

waters surrounding the Hawaiian Islands,²⁶ and future coastal developments are all scheduled to be included in the emission control areas. On the western Pacific Ocean, these are the Mediterranean Sea and the East China Sea.²⁷ Other than the previously mentioned seas, all other seas and oceans on the planet are considered non-control areas for emission.²⁸ The emission control zones designated by the IMO are depicted on the following map.²⁹

Graph (2): Emission Control Areas³⁰



Note: The North America ECA includes the US ECA and the US Caribbean ECA

26. *Id.*

27. Int'l Maritime Org. [IMO], *IMO 2020-cutting sulphur oxide emissions*, <https://www.imo.org/en/MediaCentre/HotTopics/Pages/Sulphur-2020.aspx>.

28. *Id.*

29. *Id.*

30. *Why China Needs to Protect its Coast with the IMO ECA Plans?*, MFAME, (June 20, 2019), <https://www.mfame.guru/why-china-needs-to-protect-its-coast-with-the-imo-eca-plans/>; *Emission Control Areas (ECAs) designated under MARPOL Annex VI*, INT'L MAR. ORG., [https://www.imo.org/en/OurWork/Environment/Pages/Emission-Control-Areas-\(ECAs\)-designated-under-regulation-13-of-MARPOL-Annex-VI-\(NOx-emission-control\).aspx](https://www.imo.org/en/OurWork/Environment/Pages/Emission-Control-Areas-(ECAs)-designated-under-regulation-13-of-MARPOL-Annex-VI-(NOx-emission-control).aspx), [hereinafter *IMO ECA Plans*].

Water pollution is the second. The criteria for the scrubber washwater are the same in the 2008 and 2015 Guidelines. The washwater criteria, which is applicable to both recommendations, are listed in the following table. The second table demonstrates that the legal standing and conformity of the discharged waters from the scrubbers with the 2015 regulations are of great concern. The 2008 Guidelines postponed the scrubber washwater regulations until more scientific data is gathered. It was stated that the regulations should be revised in the future as more information on the discharge's components and effects becomes available, taking into account any recommendations made by GESAMP.³¹ The 2015 Guidelines are the most recent comprehensive regulation for scrubbers, however, the idea of updating the laws governing the scrubber washwater remains.³²

Table (3): scrubbers' washwater criteria according IMO Guidelines

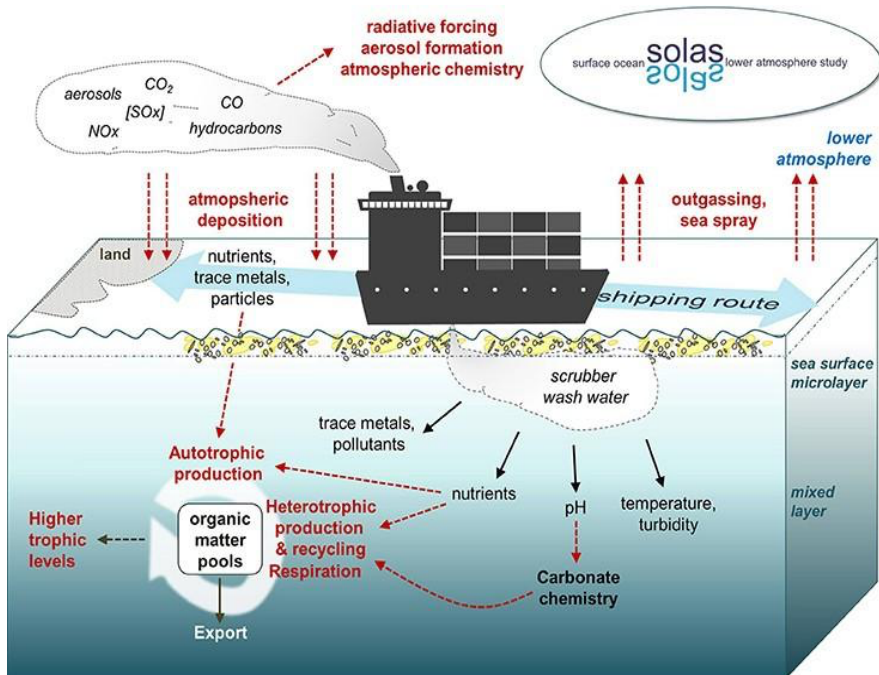
Elements	Limits
pH- 10.1.2	Less than 6.5 measured at the ship's overboard discharge- at 4 m from the overboard discharge point
PAHs-10.1.3	Less than 50 µg/L above the inlet water PAH concentration.
Turbidity/suspended Particulate Matter-10.1.4	Less than 25 FNU (formazin nephelometric units) or 25 NTU (nephelometric turbidity units) above the inlet water turbidity. It should be measured after 15 mins.
Nitrates 10.1.5	Treatment system should prevent the discharge of nitrates beyond that associated with a 12% removal of NOx from the exhaust, or beyond 60 mg/l normalized for washwater discharge rate of 45 tons MWh whichever is greater.
Washwater Additives and other substances 10.1.6	Additional washwater discharge criteria should be established.

31. UMWELTBUNDESAMT, ENVIRONMENTAL PROTECTION IN MARITIME TRAFFIC – SCRUBBER WASH WATER SURVEY, (September 2020), https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/texte_162-2020_environmental_protection_in_maritime_traffic_-_scrubber_wash_water_survey.pdf.

32. *Id.* at 28.

The graph below demonstrates how the ship acts as a barrier between air and water pollution, as well as the function of scrubbers in maintaining this position.³³

Graph (4): The Environmental Harm of Scrubbers³⁴



The previous issue has been resolved by Article 195 of the UNCLOS. It imposed a duty on the states to refrain from transferring a certain type of pollution to another.³⁵ This involves two types of transfer: the first is the transfer of pollution from one location to another, and the second is the transfer of pollution from one type (pollution of the atmosphere) to another (pollution of the ocean).³⁶ Countries are required to treat the environment as a whole, which entails preventing environmental harm in all its forms from the point of origin.³⁷

33. SHAWKAT ALAM, *ROUTLEDGE HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW* 46-48 (Shawkat Alam et al. eds., 2013).

34. *Id.*

35. U.N. Convention on the Law of the Sea, art. 195, Dec. 10, 1982, 1833 U.N.T.S. 561.

36. Detlef Czybulka, *Commentary on Article 192 to 196, in UNITED NATIONS CONVENTION ON THE LAW OF THE SEA: A COMMENTARY*, 1305 (Alexander Proelss, ed. 2017).

37. *Id.*

There are four legal issues with scrubbers' washwater. These issues include: (1) the ambiguity of the science, as previously demonstrated; (2) the ambiguity of the legal status of the scrubbers' washwater, which may be contaminated by ship pollution or by dumping. The first query affects the response to this one. The washwater from scrubbers will be regarded as pollution by dumping if it causes environmental harm. The washwater from scrubbers will be regarded as pollution from the ship even if there is no environmental harm.³⁸ (3) The third issue is the lack of clarity regarding who is in charge of reducing the environmental harm caused by scrubbers' washwater, whether in a Flag State or Coastal State. (4) The fourth issue is the lack of clarity surrounding the legal framework chosen by national authorities to control scrubbers' washwater. In a previously released article, problems (1) and (2) were covered in depth.³⁹ The final two issues—problems (3) and (4)—are the focus of this study. The UNCLOS, which governs international relations, imposes obligations on the state to prevent the transfer of pollution from one type to another or from one location to another.⁴⁰ In international law, it is unclear who, whether a coastal state or a flag state, is in charge of reducing environmental harm caused by scrubber washwater. If the washwater from scrubbers is classified as pollution from dumping or pollution from the ship (normal discharge), it should also be the ship's responsibility to take steps to reduce any environmental harm.

National regulations are severely impacted by the uncertainty at the national level. While the majority of nations do not adopt unified or semi-unified regulations, as in the case of sulfur limits, other nations have passed laws governing scrubbers' washwater before suspending them. As soon as the IMO new levels were implemented, the coast guards in Argentina banned the washwater from open loop scrubbers.⁴¹ In October 2020, the prohibition was, however, lifted.⁴² The restriction was justified by the residents' right to live in a safe, harmonious environment that is conducive to their personal growth. The entire territorial waters of Argentina, as well as its internal waters, contiguous zone, and exclusive

38. UMWELTBUNDESAMT, *supra* note 31, at 18.

39. Shams A. Al-Hajjaji, *Uncertainty in Law and Science: The International Legal Status of Scrubber Wash Water*, 27 OCEAN & COASTAL L.J. 69 (2022).

40. *Id.*

41. *Argentina Makes Provisional U-Turn on Scrubber Discharge Ban*, SHIP & BUNKER (Oct. 16, 2020), [https://www.shipandbunker.com/news/am/239054-argentina-makes-provisional-u-turn-on-scrubber-discharge-ban#:~:text=Argentina%20has%20suspended%20rules%20that,ef-fect%20on%20August%2010%2C%202020,\[hereinafter Scrubber Discharge Ban\]](https://www.shipandbunker.com/news/am/239054-argentina-makes-provisional-u-turn-on-scrubber-discharge-ban#:~:text=Argentina%20has%20suspended%20rules%20that,ef-fect%20on%20August%2010%2C%202020,[hereinafter%20Scrubber%20Discharge%20Ban]).

42. *Id.*

economic zone, are all subject to the ban.⁴³ Additionally, in some nations the ship's master is required to provide evidence that the washwater from the scrubbers does not harm the environment. The Marine Notice number 05/2019 was published in Australia by the Maritime Safety Authority.⁴⁴ It requires the ship's master to provide the Authority with the "results of all washwater testing that has been conducted in accordance with the 2015 Guidelines for Exhaust Gas Cleaning Systems."⁴⁵ If the scrubbers' washwater did not meet the requirements, the Authority would have the authority to forbid the ship from discharging it into Australian waters.⁴⁶

This article focuses on open loop scrubbers. Scrubbers come in three varieties. The open loop scrubber is depicted as the first option.⁴⁷ It cleans itself with seawater. With the help of the scrubber's machinery, seawater can flow inside to wash it from the inside out.⁴⁸ The scrubbers discharge washwater and residues into the ocean after washing is complete.⁴⁹ The second type is known as a closed loop scrubber. The scrubbers are cleaned by running fresh water through the machinery, as shown in the following figure.⁵⁰ The third type of scrubber is a hybrid of open loop and closed loop scrubbers. Only open loop scrubbers are the subject of the research for two reasons. To start, it is the most prevalent type of scrubber. The open loop scrubber is used by a majority ships with scrubbers.⁵¹ Additionally, the open loop scrubbers' washwater can adhere to the 2015 Guidelines. Because their concentration is higher than that of closed loop scrubbers, closed loop scrubbers cannot comply with these standards.⁵²

43. *Id.*

44. Australian Maritime Safety Authority, Marine Notice 05/2019, *Requirements for the Use of Exhaust Gas Cleaning Systems in Australian Waters and Reporting to AMSA* (May 2019) [hereinafter *Exhaust Gas Cleaning Systems*].

45. *Id.*

46. *News: Requirements for the Use of Scrubbers in Australian Waters & Reporting to AMSA*, STANDARD CLUB (Dec. 30, 2019), <https://www.standard-club.com/knowledge-news/news-requirements-for-the-use-of-scrubbers-in-australian-waters-reporting-to-amsa-1244>, [hereinafter *Requirements for the Use of Scrubbers*].

47. *Id.*

48. AMERICAN BUREAU OF SHIPPING, ABS ADVISORY ON EXHAUST GAS SCRUBBER SYSTEMS (2018), <https://ww2.eagle.org/content/dam/eagle/advisories-and-debriefs/exhaust-gas-scrubber-systems-advisory.pdf>.

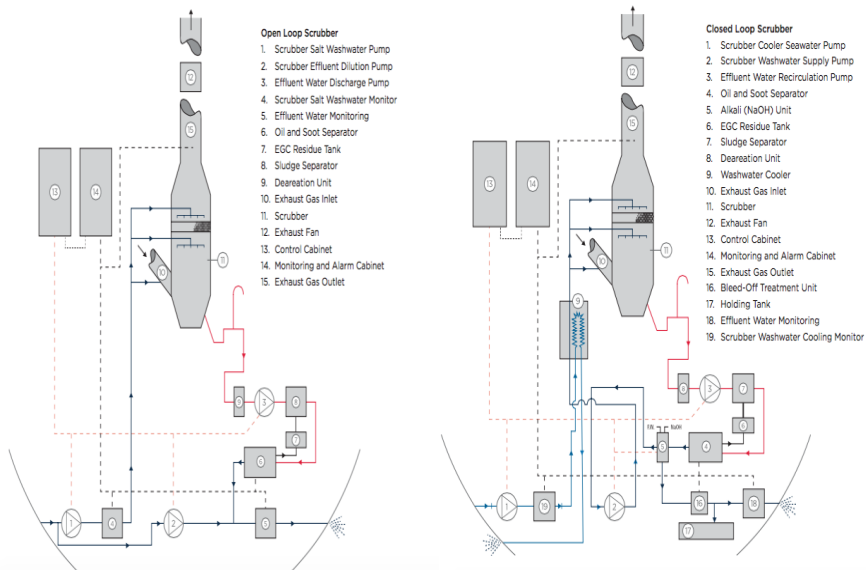
49. *Id.* at 21.

50. *Id.*

51. Bryan Comer, PhD, *Scrubbers on Ships: Time to Close the Open Loop (HOLE)*, ICCT (Jun. 18, 2020), <https://www.theicct.org/scrubbers-on-ships-time-to-close-the-open-loophole/>.

52. Int'l Maritime Org. [IMO], *Evaluation, and Harmonization of Rules and Guidance on the Discharge of Liquid Effluents from EGCS into Waters Including Conditions and Areas*, MEPC 75/INF.13 (Jan. 23, 2020), https://www.gob.mx/cms/uploads/attachment/file/546370/MEPC_75-INF.13_-_Evaluation_and_harmonization_

Figure (5) Closed and Open Loop Scrubbers:



A comparative law approach is used in this study. In order to determine which countries, share the same legal approach (either prohibiting scrubbers, permitting scrubbers, or a combination of the two), this method will compare legal regulations pertaining to scrubbers' washwater in various nations. The case study approach, which could include a macro comparison and a detailed focus on general aspects of pollution from ship regulation, is not used in the research. The study instead examines the broad categories into which the laws of every nation are divided. There are three main categories into which nations currently fit. The first category includes nations like Egypt and Qatar that forbid using scrubbers in their territorial waters altogether.⁵³ The second category consists of nations that forbid the limited use of scrubbers.⁵⁴ This category consists of nations that restrict the use of scrubbers in specific internal water areas (such as Germany) or ports (such as Sweden and Finland).⁵⁵ Argentina,

of_rules_and_guidance_on_the_discharge_of_liquid_effluents_fr..._Greece_.pdf [hereinafter *Rules on discharge of liquid effluents*].

53. Jacob Damgaard, *List of Jurisdictions Restricting or Banning Scrubber Wash Water Discharges*, BRITANNIA P&I, (April 21, 2021), <https://www.britanniapandi.com/2020/01/list-of-jurisdictions-restricting-or-banning-scrubber-wash-water-discharges/>.

54. *Id.*

55. *Id.*

China, and France are also examples of countries that restrict their bans to specific types of discharges or disposals resulting from open loop discharge.⁵⁶ The third category consists of nations that do not control how scrubber discharge is handled.⁵⁷ These nations likely either rely on the general legal guidelines for ship pollution (Article 192-237 of the UNCLOS), or they adopt a full permission standard for the discharge of scrubbers in their internal waters.⁵⁸

The research is divided into three Parts. The first reviews what entity will bear the responsibility for investigating environmental harm, especially the transboundary harm of the scrubbers' washwater. The UNCLOS recognizes three major actors in the field of marine environment.⁵⁹ These actors are the coastal state, the port state, and the flag state, and this Part presents the role of each.⁶⁰ It also tackles ways to harmonize their action, especially with the increasing number of countries regulating scrubbers' washwater.⁶¹ The second Part deals with four major trends in regulating scrubbers' washwater on the national level. These include: (1) states with scrubbers' washwater regulations, either limited ban (port jurisdiction only), or unlimited ban (territorial water and EEZ); (2) states that apply general environmental rules; (3) states that enact specific regulations to scrubbers' washwater; and (4) states that issue non-binding temporary rules. The third Part deals with the solution to the uncertainty. The research proposes two solutions: an answer to pending scientific uncertainty and the adoption of unified regulations.

II. LEGAL REGIMES GOVERNING SCRUBBER WASHWATER: DUMPING VERSUS DISCHARGE

Scrubber washwater fails pollution-by-dumping regulations.⁶² These regulations monitor the content of the washwater.⁶³ The pollution-by-dumping system deals with materials that are in scrubber washwater. Scrubbers are man-made structures.⁶⁴ These structures generate materials

56. *Id.*

57. *Id.*

58. Michael Tsimplis, *The Liabilities of the Vessel*, in MARITIME LAW 246, 394 (Yvonne Baatz, 5th ed. 2021).

59. U.N. Convention on the Law of the Sea, *supra* note 35, at 407.

60. *Id.*

61. *Id.* at 482.

62. Sam Davin, *The Trouble with Scrubbers: Shipping's Emissions "Solution" Creates New Pollution*, WWF-CANADA (July 14, 2020) <https://www.wwf.ca/stories/scrubbers-creates-new-pollution/>.

63. *Id.*

64. *Id.*

that are thrown into the sea.⁶⁵ This makes scrubbers fall under the dumping definition. The washwater includes acidic and alkaline materials, which makes them fall under the dumping regulations.⁶⁶ Scrubber washwater contains the potential of hydrogen (“pH”), Polycyclic Aromatic Hydrocarbons (“PAH”), nitrates, and trace materials that are harmful to the environment.⁶⁷ The London Convention and its Protocol regulate these materials.⁶⁸ The 2012 Guidelines also maintain that washwater may be discharged into the sea, provided that it is not harmful to the marine environment.⁶⁹

The UNCLOS Article 1.4 defines pollution of the marine environment as, any introduction of substances into the marine environment which would result in harmful consequences to the marine environment or human health.⁷⁰ This also includes any activity that would reduce the quality of the use of the seawater.⁷¹ Section 5 of the UNCLOS includes six specific types of pollution that fall under *pollution of the marine environment*.⁷² These types are: (1) pollution from land-based sources, (2) pollution from seabed activities subject to national jurisdictions, (3) pollution from activities in the area, (4) pollution-by-dumping, (5) pollution from vessels, and (6) pollution from or through the atmosphere.⁷³

There are two regimes that scholars generally consider scrubber washwater as falling under. The first regime falls under pollution-by-dumping regulations. There are several conventions that regulate pollution by dumping, including the UNCLOS, the MARPOL, and The Convention on the Protection of the Marine Environment of the Baltic Sea

65. *Id.*

66. *Id.*

67. *Id.*

68. Int'l Maritime Org. [IMO], *The London Convention and Protocol*, <https://www.imo.org/en/KnowledgeCentre/ConferencesMeetings/Pages/London-Convention-Protocol.aspx>.

69. Marine Env't Protection Committee [MEPC], Res. 219 (63), at 3, (March 2, 2012).

70. UNCLOS Article 1.4 states that “the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.” See U.N. Convention on the Law of the Sea, art. 210 ¶ 5, Dec. 10, 1982, 1833 U.N.T.S. at 561.

71. *Id.*

72. *Id.*

73. *Id.*

Area.⁷⁴ The issue of pollution of the ocean was first presented in the 1958 Geneva Convention on the high seas.⁷⁵ Articles 24 and 25 regulated only two issues: the discharge of oil and the dumping of radioactive waste.⁷⁶ In 1972, the Stockholm Declaration banned the discharge of all forms of toxic substances, and also included a state responsibility to prevent pollution of the seas.⁷⁷ The three main legal texts which discuss the issues of dumping from ships include: (1) the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (“London Convention”), which came into force on August 30, 1975; (2) the 1982 UNCLOS; and (3) and the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (“London Protocol”).⁷⁸

The second regime falls under pollution-from-ship regulations. The UNCLOS and the MARPOL Annex V are the most extensive legal texts dealing with pollution from ships.⁷⁹ The MARPOL includes six annexes, which are: (1) Annex I - Regulations for the Prevention of Pollution by Oil (entered into force October 2, 1983), (2) Annex II - Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (entered into force October 2, 1983), (3) Annex III - Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (entered into force July 1, 1992), (4) Annex IV - Prevention of Pollution by Sewage from Ships (entered into force September 27, 2003), (5) Annex V - Prevention of Pollution by Garbage from Ships (entered into force December 31, 1988), (6) Annex VI - Prevention of Air Pollution from Ships (entered into force May 19, 2005).⁸⁰ This part will show the different definitions, permitted materials, bank substances, competent authorities, measures and auditing mechanisms in all four legal texts. The research excludes the

74. MARIN STOPFORD, *MARITIME ECONOMICS* 682 (3d ed. 2009); U.N. Convention on the Law of the Sea, art. 209, Dec. 10, 1982, 1833 U.N.T.S. 561 *supra* note 70, art. 209; BAKHTOV ET AL., *supra* note 5, at 1.

75. Detlef Czybulka, *Commentary on Article 192 to 196, in UNITED NATIONS CONVENTION ON THE LAW OF THE SEA: A COMMENTARY*, 1299 (Alexander Proelss, ed., 2017).

76. Convention on the High Seas arts. 24-25, April 29, 1958, 450 U.N.T.S. 11.

77. U.N. Conference on Human Environment, *Report of United Nations Conference on the Human Environment*, U.N. Doc. A/CONF.48/14/Rev.1 (1995).

78. Int'l Maritime Org. [IMO], *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* (1972), <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/LC1972.pdf>, [hereinafter *Prevention of Marine Pollution*].

79. Damien Cremean & Erika Techera, *Marine Pollution Law*, in *ROUTLEDGE HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW*, 285-289 (Shawkat Alam et al. eds., 2013).

80. Int'l Convention for the Prevention of Pollution from Ships (MARPOL), IMO (2019), [https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx), [hereinafter *MARPOL*].

MARPOL because it has not yet entered into force and its annexes have become the main source for the issues related to the pollution from ships.⁸¹ Additionally, the remaining five annexes are not directly relevant to the case of scrubbers, especially Annex VI, which is related to air pollution from ships.⁸² This is because scrubbers are effective in reducing the air emission from ships.⁸³ The analysis regarding the pollution from ships, or discharge from ships, includes only the UNCLOS, the MARPOL, the MARPOL Annex IV, and the MARPOL Annex V.

III. UNCERTAINTY ON THE INTERNATIONAL LEVEL: COASTAL/PORT STATE VERSUS FLAG STATE

A. The Competent Authority to Mitigate Environmental Harm

UNCLOS has established a balance between internationally qualified actors in the case of pollution by dumping.⁸⁴ First, the coastal state is the state that has the authority to handle dumping cases and permits relating to dumping.⁸⁵ In addition, the IMO is regarded as the international body with the necessary authority, and its members are required to abide by its regulations.⁸⁶ Furthermore, the EU directive has seemingly taken into account the majority of the IMO's rulings. However, this has changed with regard to the emission regulation that went into effect in 2019.⁸⁷ The EU released its "green deal" in 2019, which sets a higher standard for reducing emissions than the IMO.⁸⁸ The standard was raised to zero pollution/emissions when the EU published its European Climate Law in May 2021.⁸⁹ Third, if the ship intends to discharge any materials in the coastal state's territorial waters, the coastal state must expressly approve it in writing to the flag state.⁹⁰ Any licensed dumping action must have "express prior approval," as required by Article 210.⁹¹

81. *Id.*

82. Sargun Sethi, *A Guide to Scrubber System on Ship*, MARINE INSIGHT (Mar. 22, 2021), <https://www.marineinsight.com/tech/scrubber-system-on-ship/>.

83. *Id.* at 1.

84. U.N. Convention on the Law of the Sea, *supra* note 35, at 399.

85. *Id.* at 561.

86. *IMO 2020-cutting sulphur oxide emissions*, *supra* note 27, at 1.

87. Directive 2005/33 of the European Parliament and the Council of July 6, 2005, amending Directive 1999/32, 2005 O.J. (L 191) 59, 59 [hereinafter Directive 2005/33].

88. European Climate Law (EC), https://ec.europa.eu/clima/policies/eu-climate-action/law_en.

89. *Id.*

90. U.N. Convention on the Law of the Sea, *supra* note 35, at 561.

91. *Id.*

The competent authority's regulation of ship pollution is based on a number of UNCLOS-mandated factors. The first thing UNCLOS attempted to do was strike a balance between the IMO and the coastal state, flag state, and port state.⁹² It transfers to the state the duty to create international norms and standards.⁹³ However, according to Article 211/1, they must do so through the IMO, a capable international organization.⁹⁴ This Article gives the IMO and its MEPC the authority to issue all the specific regulations pertaining to ship pollution.⁹⁵ Additionally, it includes the power to negotiate MARPOL, its protocols, annexes, and the rules that explain the regulation to both member states and the shipping industry.⁹⁶ Additionally, UNCLOS mandates that the state and IMO periodically review their regulations regarding ship pollution.⁹⁷ Even though this is not always the case (as in the cases of the 2008 and 2015 guidelines regarding washwater), it is still a good way to ensure the regulations and standards relating to ship pollution are flexible.⁹⁸ With regard to MARPOL, it lays out general guidelines for the appropriate authority to address the problem of pollution from ships.⁹⁹ In general, the flag state, if it belongs to MARPOL, is responsible for upholding the regulations governing ship pollution.¹⁰⁰ The port state and the coastal state are in charge of enforcing MARPOL regulations if the ship's flag state is not a signatory.¹⁰¹ The MARPOL Annex V assigns the port state the majority of the responsibility for ship operation, and a ship's operation may be inspected by the port authorities in accordance with regulation 7.¹⁰² As long as the crew of the ship cannot resolve any fragmentation of the garbage discharge, the authorities have the right to stop the ship from sailing in the event that it violates the rules of Annex V.

92. Arup Poddar, *Marina Pollution and its regulation*, 3 INT. J. L. STUD. & RES. 148-155 (2014); *see also*, Liu Nengye, *International Legal Framework on the Prevention of Vessel-Sourced Pollution*, 2 CHINA OCEANS L. REV. 240-245 (2010).

93. *Id.*

94. *Id.*

95. *Id.*

96. *Id.*

97. CREMEAN, ET AL., *supra* note 79, at 287.

98. *Id.*

99. Amendments to the Annex of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships Regulation 8, July 15, 2011, [https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.201\(62\).pdf](https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.201(62).pdf), [hereinafter MARPOL Annex V].

100. *Id.* at 268.

101. *Id.*

102. *Id.*

B. The Competent Authority's Measures to Mitigate Environmental Harm

Under pollution by dumping, UNCLOS adopts several measures to ensure that dumping rules are effective.¹⁰³ First, it creates a balance between the national, and international laws.¹⁰⁴ It ensures that states do not adopt lenient measures in international law, or international organizations.¹⁰⁵ Second, UNCLOS mandates that states and international organizations re-examine the rules from time to time.¹⁰⁶ This obligation is meant to ensure continuous abolishment of obsolete rules, and the continuous adaptation to new rules related to dumping materials.¹⁰⁷ Third, while states can adopt their own rules, they should act in accordance with competent international organizations, especially the IMO.¹⁰⁸ States are expected to adopt either international standards, or higher standards.¹⁰⁹

Annex III of the 1972 London Convention addresses three categories of provisions to be considered in establishing criteria for the issuance of sea dumping permits.¹¹⁰ Category A addresses the characteristics and composition of the matter.¹¹¹ Indicia under this section include the amount and average composition of the matter dumped, its form, properties of the dumped materials, toxicity, persistence, accumulation, biotransformation in biological materials, susceptibility to physical, chemical, and biological changes, as well as the matter's probability of reducing the marketability of resources.¹¹²

Category B addresses characteristics of the dumping site and the method of deposit.¹¹³ It stipulates the indicia that should be included in the permit for the dumping location.¹¹⁴ These include coordinates of the dumping area, rate of disposal per scientific period, methods of packaging, initial dilution achieved by the proposed method of release, water characteristics, bottom characteristics (topography or geochemical),

103. U.N. Convention on the Law of the Sea, *supra* note 35, at 561.

104. *Id.* at 91.

105. *Id.*

106. *Id.*

107. Kristin Bartenstein, Commentary, *Article 211 to 215 in U.N. Convention on the Law of the Sea: Commentary*, 1429 (Alexander Proelss ed., 2017).

108. U.N. Convention on the Law of the Sea, *supra* note 35, at 108.

109. *Id.*

110. U.N. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, June 23, 1977, 1972 U.N.T.S 138.

111. *Id.* at 204.

112. *Id.*

113. *Id.* at Annex III. B.

114. *Id.*

existence of other dumping in the chosen site, and scientific evidence of the effect of dumping.¹¹⁵

Category C addresses the general considerations and conditions of dumping. This includes four general considerations.¹¹⁶ They are (1) the possible effects on amenities, (2) the possible effects on marine life, (3) the possible effects on other uses of the sea, and (4) the practical availability of alternative land-based methods of treatment.¹¹⁷ As for the 1996 London Protocol amended in 2006, it mandates contracting parties “not to transfer, directly or indirectly, damage or likelihood of damage from one part of the environment to another or transform one type of pollution into another.”¹¹⁸

In pollution by the ship, UNCLOS ensures specific measures for each type of state.¹¹⁹ Upon reading through the articles of UNCLOS, UNCLOS seemingly cooperates with IMO provisions. For the flag state, it shall adopt laws that have the same enforcement power as the international standards or higher standards.¹²⁰ If the flag state adopts higher standards than the international ones, there is no legal problem as these rules are for the best of the environment.¹²¹ However, the problem arises when the flag state adopts more lenient measures than the international ones. UNCLOS obliges states to raise their standards to the minimum threshold, which are international rule or standards.¹²² UNCLOS, which adopts a higher standard related to the pollution from ships, requires the coastal state to distinguish between its rules in ports, internal water or offshore terminals, and its rules in EEZ.¹²³ The coastal state is also required to give due publicity to all the requirements through IMO.¹²⁴ This obligation is meant to inform the ships’ crews of foreign vessels that they should comply with the new rules in the coastal state territory.

The legal publicity of the rules seemingly helps to establish the assumption of *Ignorantia juris non excusat*, i.e., “ignorance of law excuses no one.” Additionally, the coastal state shall take into consideration the three conditions. (1) The coastal state shall follow the general

115. *Id.*

116. *Id.* at Annex III. C.

117. U.N. Convention on the Law of the Sea, *supra* note 35, at 86.

118. Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter art. 3.3, 1996, amend. 2006.

119. U.N. Convention on the Law of the Sea, *supra* note 35, at 397-98.

120. TSIMPLIS, *supra* note 58.

121. BARTENSTEIN, *supra* note 107.

122. U.N. Convention on the Law of the Sea, *supra* note 35, at 104-110

123. *Id.* at 104-106.

124. *Id.* at 32-33.

requirements related to the publication of the pollution limits.¹²⁵ (2) The coastal state shall recognize “technical reasons in relation to its oceanographical and ecological conditions, as well as its utilization or the protection of its resources and the particular character of its traffic.”¹²⁶ (3) The coastal state cannot force foreign vessels in its EEZ to comply with requirements related to the “design, construction, manning or equipment standards other than generally accepted international rules and standards.”¹²⁷ The only exception to that is when IMO accepts the coastal state’s higher standards.¹²⁸

As for MARPOL, the convention imposes several measures regarding the violation of their rules. Under MARPOL, States have an obligation to detect any violation of the convention.¹²⁹ This obligation does not violate the freedom of the high seas mentioned in UNCLOS.¹³⁰ Additionally, States and especially coastal states, have the right to inspect any ship within its territorial water to identify any violation.¹³¹ However, the burden of proof is always on the state. It has to prove that the discharged materials are harmful to the environment.¹³² Furthermore, if the state shall inform the master of the ship of any fragmentation that the state authorities find in the ship under investigation.¹³³ If the state wishes to proceed with legal action against the alleged violation, it shall do so promptly. These procedures shall not be the reason for any undue delay of the ship.¹³⁴ The state shall inform IMO and the flag state, upon the request of the state, of all the procedures and the results of the investigation.¹³⁵ As

125. U.N. Convention on the Law of the Sea, art. 211, 6(b), Dec. 10, 1982, 1833 U.N.T.S. 561.

126. *Id.* at art. 211¶ 6 (a)

127. *Id.* at art. 211¶ 6 (c)

128. *Id.*

129. Protocol I, Provisions Concerning Reports on Incidents Involving Harmful Substances, art. II, Feb. 17, 1978, 1340 U.N.T.S. 70 (entered into force Oct. 2, 1983). [hereinafter MARPOL Protocol I].

130. Article 87 of the UNCLOS states that the high seas are open to all States, It comprises, inter alia, both for coastal and land-locked States:(a) freedom of navigation;(b) freedom of overflight;(c) freedom to lay submarine cables and pipelines, subject to Part VI;(d) freedom to construct artificial islands and other installations permitted under international law, subject to Part VI;(e) freedom of fishing, subject to the conditions laid down in section 2;(f) freedom of scientific research, subject to Parts VI and XIII.2. These freedoms shall be exercised by all States with due regard for the interests of other States in their exercise of the freedom of the high seas, and also with due regard for the rights under this Convention with respect to activities in the Area.” U.N. Convention on the Law of the Sea, *supra* note 35, at 57.

131. *Id.* at 52.

132. *Id.* at 106.

133. *Id.* at 109.

134. *Id.*

135. MARPOL Protocol I, *supra* note 129 at 1983.

for the MARPOL Annex V, it includes general rules to all member states, and specific rules to the port authorities.¹³⁶ As for the general rules to the member states, the annex puts some conditions that all member states should follow;¹³⁷ (1) Parties shall exercise their authority only if they are flag states or port states.¹³⁸ However, if they are coastal states, they shall not exercise this jurisdiction over the ships in the high seas;¹³⁹ and (2) Parties shall notify IMO of any cases of violation to the Annex regulations.¹⁴⁰ As for the specific rules to the port authorities, the MARPOL Annex V ensures the right of the port state to inspect, through its authorized officers, any violation related to the operation of the ship, including any potential allegations of pollution.¹⁴¹ Moreover, the Annex also gives this authority the right to prevent the ship from sailing in case of an unsolved situation of pollution.¹⁴² The port state's right to suspend the violated crew and ship has to be done in conjunction with the principle of prompt release of the vessels.¹⁴³ According to Article 292 of UNCLOS, authorities of state parties shall release any detained ship or crew promptly upon payment of a reasonable bond or other financial security.¹⁴⁴ In the *M/V Saiga* case, the court found that releasing a ship after 80 days of detention was not considered as a prompt release.¹⁴⁵ Thus, port states should deal with the articles related to its right to detain ships with high caution.¹⁴⁶

136. Amendments to the Annex of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships Regulation 8, July 15, 2011, [https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.201\(62\).pdf](https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.201(62).pdf) [hereinafter MARPOL Annex V].

137. *Id.*

138. *Id.*

139. *Id.*

140. *Id.* at Regulation 8.

141. *Id.*

142. *Id.*

143. Günther Jaenicke, *Prompt Release of Vessels-The M/v "Saiga" Case*, Max Planck Y.B. U.N. L. 388 (1998), https://www.mpil.de/files/pdf2/mpunyb_jaenicke_2.pdf.

144. Int'l Tribunal for the Law of the Sea, art. 292, Dec. 10, 1982, 1833 U.N.T.S. 561.

145. *M/V Saiga* (No. 2) (St. Vincent v. Guinea), Case No. 2, Judgment of July 1, 1999, ITLOS Rep. 10, 165.

146. *Id.*

IV. LEGAL MODELS ADOPTED ON THE NATIONAL LEVEL: DISCREPANCIES IN STATES' POSITION

A. Limited versus Unlimited Ban

The first legal model adopted on the national level involves either a limited or unlimited ban.¹⁴⁷ Countries adopt the limited ban on scrubbers' washwater on the port's jurisdictions only. This means that the ship can still release the scrubbers' washwater to other national waters, including territorial water and EEZ. In Canada, Vancouver Fraser Port Authority issued new guidelines on scrubbers' washwater that came into effect on March 1, 2022.¹⁴⁸ The new guidelines prohibit the release of the scrubbers' washwater from all types of scrubbers (open loop, close loop, or hybrid).¹⁴⁹ The guidelines are limited to the vessels at the "anchorage, or at berth within the port of Vancouver."¹⁵⁰ Ships with hybrid and close loop scrubbers are required to shift to zero discharge mode.¹⁵¹ This means that scrubbers' washwater must be kept in tanks until deposited of at an authorized shore reception facility.¹⁵²

China is considered as the largest country investing in scrubbers.¹⁵³ It is estimated that the number of vessels that have installed scrubbers are more than 2,700 ships in early 2020.¹⁵⁴ In October 2019, China Maritime Safety Administration issued a notice on the Implementation plan of 2020 global sulfur limit that was set by IMO.¹⁵⁵ Article 4 of the Notice prohibits the release of the washwater "from open-loop scrubbers in China's emission control areas."¹⁵⁶ As a result, ships must shift to closed loop scrubbers as long as they do not release the water in the sea.

147. Damgaard, *supra* note 53 at 1.

148. *Port Information Guide*, PORT OF VANCOUVER (Mar. 1, 2022), <https://www.portvancouver.com/wp-content/uploads/2022/03/2022-03-01-PORT-INFORMATION-GUIDE-3.pdf>.

149. *Id.*

150. *Id.*

151. *Id.*

152. *Id.*

153. Michelle Wiese Bockmann, *Chinese Owners and Leasing Banks Dominate Scrubber Investment*, LLOYD'S LIST, Feb. 14, 2020.

154. *Id.* at 65.

155. *China Maritime Safety Administration (MSA) Notice - Implementation plan of 2020 global sulphur limit*, CHINA CLASSIFICATION SOCIETY, https://www.steamshipmutual.com/sites/default/files/downloads/articles/2019/China%20Maritime%20Safety%20Administration%20Notice-implementation%20plan%20on%20the%202020%20global%20sulphur%20limit_.pdf (last visited Mar. 3, 2023).

156. *Id.* at 1.

This also applies to several ports. On October 3, 2020, Indian port operator, Adani Ports, issued circular number (APSEZL/ Marine / 16/2020) to regulate scrubbers.¹⁵⁷ In Ireland, three ports prohibit the release of scrubber washwater from any kind of scrubbers. The first port is Waterford, with a ban that came into effect in January 2019.¹⁵⁸ The second port is Port of Cork, which issued Notice to Mariners number 15 of 2018.¹⁵⁹ The third port is Dublin Port, which issued Notice to Mariners number 21 of 2019.¹⁶⁰ The discharge of scrubber washwater from open-loop scrubbers' in port jurisdictions in Kenya,¹⁶¹ the Port of Singapore,¹⁶² and within the Panama Canal,¹⁶³ is prohibited.

Other countries adopt an unlimited ban on scrubber washwater. This means that the release of scrubber washwater into the water is totally forbidden. This includes internal waters, port waters, territorial waters and EEZ. In Bahrain, discharged scrubber washwater is held under strict procedures.¹⁶⁴ The Ministry of Transportation and Telecommunication issued Marine Notice PMA/03/2019, effective on December 31, 2019, to regulate scrubber washwater.¹⁶⁵ This Marine Notice distinguishes between two waters, port waters, and territorial waters.¹⁶⁶ For port water, the Marine Notice prohibits any release of scrubber washwater.¹⁶⁷ As for territorial waters and EEZ, the Marine Notice provides instructions for any [w]ashwater residues generated by the EGC unit.¹⁶⁸ The Marine

157. *Guidelines on compliance with Annex VI compliance*, (Oct. 3, 2020) <https://britan-niapandi.com/wp-content/uploads/2020/11/Guidelines-on-compliance-with-MARPOL-Annex-VI-APSEZL-Marine-16-2020-Adani-10-2020.pdf>.

158. Darren Doyle, *Prohibition on the Discharge of Exhaust Gas Scrubber Wash Water*, PORT OF WATERFORD (2019), [https://www.portofwaterford.com/wp-content/uploads/2022/07/Notice_to_Mariners_No_1_of_20191.pdf_\(lr.\)](https://www.portofwaterford.com/wp-content/uploads/2022/07/Notice_to_Mariners_No_1_of_20191.pdf_(lr.)).

159. P. O'Regan, *Prohibition on the Discharge of Exhaust Gas Scrubber Wash Water*, PORT OF CORK (Nov. 12, 2018), [https://www.portofcork.ie/notices-to-mariners/\(lr.\)](https://www.portofcork.ie/notices-to-mariners/(lr.)).

160. *Notice to Mariners, Number 21 of 2019, Prohibition on the Discharge of Exhaust Gas Scrubber Wash Water*, Dublin Port Company, (Jan. 1, 2019), <https://www.egcsa.com/wp-content/uploads/21-2019-Discharge-of-Exhaust-Gas-Scrubber-Wash-Water.pdf>.

161. Kenya Maritime Authority, Kenya National Guideline for Implementation of IMO 2020, (Jan. 1, 2020).

162. *IMO 2020 Sulphur Limit, A Guide for Ships Calling to Port of Singapore*, MPA SINGAPORE, (Jun. 13, 2019), <https://www.mpa.gov.sg/docs/mpalibraries/mpa-documents-files/shipping-division/singapore-registry-of-ships/register-with-srs/ships-calling-singapore-port-final.pdf>, [hereinafter *IMO 2020 Sulphur Limit*].

163. Panama Canal Authority, Notice to Shipping NO N-1-2020, (Issued on Jan. 1, 2020).

164. Ministry of Transportation and Telecommunications, *Exhaust Gas Cleaning System, Marine Notice PMA/03/2019* (2019) (Kingdom of Bahr.)

165. *Id.* at 2.

166. *Id.*

167. *Id.*

168. *Id.*

Notice prohibits any release of scrubber washwater from open-loop scrubbers. There are two conditions required to permit such a release: the washwater must comply with the IMO 2015 guidelines, and the Master of the vessel must prove that it does not harm the marine environment.¹⁶⁹ In all cases, the Marine Notice requires the process of releasing scrubber washwater must be monitored and recorded.¹⁷⁰ Additionally, the Master of the vessel must have a special permit from the Marine Safety and Environment Protection Directorate.¹⁷¹ Before releasing the washwater, the shipmaster must inform the Directorate with their intention for such release, including the “[r]esults of all washwater testing that has been undertaken in accordance with 2015 Guidelines for Exhaust Gas Cleaning Systems.”¹⁷²

In Germany, there is a distinction between territorial waters, EEZ, and inland waters.¹⁷³ For territorial waters and the EEZ, section 13.7 of *Umweltverhaltensverordnung* prohibits the release of scrubber washwater, unless it can be proven that there is no harm to the environment or humans.¹⁷⁴ As for inland waters, it is governed by two legal texts.¹⁷⁵ The first is the Water Management Act (*Wasserhaushaltsgesetz*), which indicates scrubber washwater falls under the regulation of Paragraph 9.1.4.¹⁷⁶ The Act requires prior authorization to release such water inland.¹⁷⁷ The second is the Strasbourg Convention on the Collection, Deposit and Reception of Waste during Navigation on the Rhine and Inland Waterways (the “Convention”) adopted in September 1996.¹⁷⁸ The Convention prohibits the release of any “ship-generated waste.”¹⁷⁹ The official position

169. Ministry of Transportation and Telecommunications, *supra* note 164, at 2.

170. *Id.*

171. *Id.*

172. *Id.*

173. Stefan Schmlke ET AL., *Environmental Protection in Maritime Traffic- Scrubber Wash Water Survey, Final Report* (2002) available at <https://www.umweltbundesamt.de/publikationen>.

174. Section 13.7 states that, “[d]ischarge of washwater from waste gas cleaning systems on sea waterways and in the exclusive economic zone is prohibited unless it is demonstrated that the washwater discharge does not have a significant negative impact on human health and the environment. If the chemical used is caustic soda, it is sufficient that the washing water meets the criteria of the guidelines for exhaust gas cleaning systems and its pH is not more than 8.0.” *Verordnung über das umweltgerechte Verhalten in der Seeschifffahrt* [Ordinance on Environmentally Friendly Behavior in Maritime Shipping] (2014) (Ger.) available at <https://www.gesetze-im-internet.de/seeumwverhv/BJNR137110014.html>, [hereinafter Environmentally Friendly Behavior].

175. Stefan Schmlke et al., *supra* note 173, at 25.

176. *Id.*

177. *Id.*

178. *Id.*

179. Article 3 states, “Prohibition of dumping and discharging: (1) Dumping or discharging waste generated on board or any part of the cargo from vessels into the waterways referred to in

of the German Environmental Agency is to consider scrubber washwater as classified as “other waste generated from the operation of a vessel.” (German Environmental Agency).¹⁸⁰

B. Specific versus General Regulations

Countries also choose between two legal models to regulate scrubber washwater, which are either specific or general regulations. Some countries apply the general rules of environmental law on scrubber washwater. In Slovenia, the prohibition of scrubber washwater falls under the general rules of the Water Act.¹⁸¹ Article 66 paragraph 4 states that, “With the exception of unpolluted cooling water, the discharge of vessel-generated wastewater into waters directly from vessels shall be prohibited.”¹⁸² Various countries also issue a special regulation to regulate scrubbers’ washwater. In Estonia, the Minister of Environment issued Regulation No. 73,¹⁸³ banning the release of scrubbers’ washwater. The only exception is if the ship’s owner manages to prove that the water is not harmful to the environment, or human health.¹⁸⁴ In addition, the ship’s owner must show that the washwater meets the criteria mentioned in the 2015 Guidelines related to scrubbers’ washwater.¹⁸⁵ In this case, the ship’s owner must get the required permission from the port authorities in order to release such washwater.¹⁸⁶ As for the close loop scrubbers, the circular permits its use as long as the washwater is not released in the Estonian territorial water.¹⁸⁷ The circular did not propose how to handle the washwater from the closed loop scrubbers.

In France, the Ministry of the Sea has issued a new measure to ban scrubbers’ washwater.¹⁸⁸ It came into force in January 2022 and included

Annex 1 shall be prohibited.” See *Convention on the Collection, Deposit and Reception of Waste Produced during Navigation on the Rhine and Inland Waterways*, art. 3, Sept. 9, 1996, at 9, https://www.ccr-zkr.org/files/conventions/convdechets2019_en.pdf [hereinafter C.D.N.I.].

180. Stefan Schmlke et al., *supra* note 173, at 25.

181. WATER ACT, ZV-1, No. 3237, art. 66(4), Official Gazette of the Republic of Slovn. (2002), <https://www.uradni-list.si/>.

182. *Id.* at 32.

183. MAREK RAUK, MARITIME ADMINISTRATION, REPUBLIC OF EST., CLARIFICATION OF EXHAUST GAS CLEANING SYSTEM (EGCS) OPERATIONS IN TERRITORIAL WATERS AND PORTS OF EST. 4 (2019).

184. *Id.* at 1.

185. *Id.*

186. *Id.* at 2.

187. *Id.*

188. *Scrubbers: Entree en Application de L’interdiction de Rejets Des le 1er Janvier 2022* [*Scrubbers: Entry into Application Ban on Discharges from January 1, 2022*], MINISTERE DE LA

a fall ban on the release of scrubbers' washwater.¹⁸⁹ The ban includes both the port water and territorial waters within 3 Nautical Miles.¹⁹⁰ The Decree issued also includes criminal environmental responsibility on the ship's captain.¹⁹¹ The ship's safety inspectors from the Ministry have the right to monitor the compliance of the ship against the new measures.¹⁹² The penalties applicable in the event of an infringement may start at 4,000 Euros for the captain of the ship and escalate to 7 years in prison and a fine of 10.5 million Euros depending on the vessel concerned.¹⁹³

In Ghana (member), the Maritime Authority issued Shipping Notice number 12.¹⁹⁴ This notice bans ships from releasing scrubbers and washing water.¹⁹⁵ The ban includes both the port and territorial waters of Ghana.¹⁹⁶ Its aim is to prevent marine pollution.¹⁹⁷ The notice did not include any remedies for non-compliance.¹⁹⁸ In Mauritius (a member of MARPOL), the Ministry of Ocean Economy, Marine Resources, Fisheries and Shipping issued merchant shipping notice 2 of 2019 that focused on the sulfur cap.¹⁹⁹ The Notice bans the release of scrubbers' washwater within 12 nautical miles of Mauritius' shores, based on the national legislation.²⁰⁰ The notice did not impose new restrictions, yet it is there to remind shipmasters of its existence. In Qatar (not a member of MARPOL), the Qatar Petroleum Mesaieed Industrial City Port issued an Information and Regulations Guide in January 2020.²⁰¹ The guidelines reiterate that the release of the scrubbers washwater is banned based on the Qatari Environmental Law.²⁰²

MER, May 17, 2022, <https://mer.gouv.fr/scrubbers-entree-en-application-de-linterdiction-de-rejets-des-le-1er-janvier-2022>.

189. *Id.* at 1.

190. *Id.*

191. *Id.* at 2.

192. *Id.*

193. *Id.*

194. *Maritime Authority Bans Discharge of Wash Water From Open-Loop*, GHANA MAR. AUTH., (Dec. 14, 2021), <https://ghanamaritime.org/home/maritime-authority-bans-discharge-of-wash-water-from-open-loop/> (last visited Feb. 14, 2022), [hereinafter *Wash Water*].

195. *Id.*

196. *Id.*

197. *Id.*

198. *Id.*

199. MINISTRY OF OCEAN ECON., MARINE RE., FISHERIES AND SHIPPING, IMPLEMENTATION OF IMO 2020 0.5% GLOBAL SULPHUR CAP, MERCHANT SHIPPING NOTICE 2 OF 2019, AT ¶ 3.9, (Oct. 1, 2019), Mauritius.

200. *Id.*

201. *MIC Port Information and Regulations Guide January 2020 Edition*, QATAR PETROLEUM, at ¶ 6.73, [hereinafter *MIC Port Information*].

202. *Id.*

Countries use mixed approaches. Regulatory authorities issue specific regulations to scrubbers' washwater on port jurisdiction, while applying the general rule on the territorial water and EEZ. In Egypt, the regulation of scrubbers' washwater falls under both general, and specific legal frameworks. For the general regulation, the Environmental Law number 4 for 1994, and its amendment law number 9 for 2009, include rules related to general prohibition against the release of any harmful substance in the Egyptian territorial sea.²⁰³ Article 66 prohibits any discharge from ships in the Egyptian territorial sea, or EEZ.²⁰⁴ Article 65 holds the shipmaster responsible for compliance with the implementation of the Egyptian Environmental Law.²⁰⁵ As for the specific framework, the Suez Canal Authority issued Circular 8 of 2019,²⁰⁶ which bans ships from releasing scrubbers' washwater during their transit in the Suez Canal.²⁰⁷ The Circular did not distinguish between open loop scrubber, or closed loop scrubber, which means that all types of washwater are banned.²⁰⁸

In Turkey, both the general environmental legal framework, and the specific legal framework, ban the release of scrubber washwater in the Turkish territorial water.²⁰⁹ Article 8 of the Turkish environmental code bans any “. . .diffuse, direct and indirect, all kinds of waste and scraps into the recipient environment. . .”²¹⁰ [1] As for the specific legal framework, on April 6, 2021, the Ministry of Environment and Urbanization issued a General Directorate for Environmental Management,²¹¹ which focuses mainly on the release of scrubber washwater, and that its release in the Turkish territorial water is prohibited.²¹² [2] Instead, they require ships that use scrubbers to restore the washwater, not release it.²¹³ The

203. Law No. 4 of 1994 (Environmental Law), *al-Jarīdah al-Rasmiyah*, vol. 5, Feb. 3, 1994, art. 65-66, amended by Law No. 9 for 2009 (Egypt).

204. *Id.* at art. 66.

205. *Id.* at art. 65.

206. Circular No. 8/2019, Suez Canal Authority, Dec. 2019 (Egypt).

207. *Id.*

208. *Id.*

209. Law No. 2872 of 1983 (Environment Law), setting 5, vol. 22, p. 499, Aug. 11, 1983, art. 8 (Turk.).

210. *Id.* at art. 12.

211. *Id.*

212. General Directorate for Environmental Management: Discharging of Scrubbers Washing Water No. E-84973951-140.99-698452, Ministry of Environment and Urbanization, June 4, 2001 (Turk.) <https://alandia.wntr.io/uploads/2021/04/translation-of-the-official-announcement-1.pdf> [hereinafter General Directorate for Environmental Management].

213. *Id.*

Directorate focuses on regulation, and Controlling Water pollution (31.12.2004).²¹⁴

C. Binding versus Non-Binding Regulations

Legal rules are binding and permanent. However, States issue non-binding or temporary legal rules related to scrubbers. This is due to uncertainty related to environmental harm. For countries that adopt non-binding legal rules, the Ministry of environment in New Zealand issues non-binding guidelines on the use of Exhaust Gas Cleaning Systems (Scrubbers) for ports, regional authorities, and ships.²¹⁵ The Guidelines include non-binding (non-statutory) rules related to scrubber washwater.²¹⁶ The Guidelines urge the industry to release the washwater from open loop scrubbers outside the territorial water.²¹⁷ As for the close loop scrubbers, ships can operate them in zero discharge modes.²¹⁸

Saudi Arabia is one of the countries that issue temporary regulations. The Saudi Ports' Authority issued Circular No. 55 /2020, which bans the release of scrubber washwater in all ports, and territorial waters.²¹⁹ However, this ban is temporary until further scientific studies on the environmental impact of open loop scrubbers are concluded.²²⁰

V. RECOMMENDATIONS TO SOLVE THE UNCERTAINTY: ADOPTION OF UNIFIED LEGAL MODEL

There are three main solutions to solve the uncertainty related to mitigating environmental harm from scrubber washwater. These solutions are: (A) A neutral scientific body addresses whether scrubber washwater is harmful to the environment, (B) resorting states resort to the precautionary principle to avoid environmental harm, and (C) states adopt a

214. *Id.*

215. *Guidance on the Use of Exhaust Gas Cleaning Systems (scrubbers) for Ports, Regional Authorities and Ships*, MINISTRY FOR THE ENVIRONMENT (April 13, 2021) (N.Z.), <https://www.environment.govt.nz/guides/guidance-on-the-use-of-exhaust-gas-cleaning-systems-scrubbers-for-ports-regional-authorities-and-ships> [hereinafter *Guidance on the Use of Exhaust Gas Cleaning Systems*].

216. *Id.*

217. *Id.*

218. *Id.*

219. Circular no. (55) 2020 from the Mawani Saudi Ports Authority on Preventing Ships Exhaust Washwater Discharges by ECGS System Designed as Open Loop into Saudi Ports, [https://www.mawani.gov.sa/en-us/EServices/Lists/Circular/Attachments/6/Circular%20\(55\)%202020.pdf](https://www.mawani.gov.sa/en-us/EServices/Lists/Circular/Attachments/6/Circular%20(55)%202020.pdf) [hereinafter Circular no. (55) 2020 from the Mawani Saudi Ports Authority].

220. *Id.*

unified rule related to the scrubber washwater. A neutral scientific body addresses whether scrubber washwater is harmful to the environment: currently, very few states try to answer the question of the effect of scrubber washwater on the marine environment, and human health. Nonetheless, these endeavors increase the complexity of the scrubber washwater situation.

Instead of determining the environmental effects of scrubber washwater, studies increase the concerns regarding the uncertainty of science.²²¹ To end this uncertainty, IMO in coordination with states, either coastal, or flag states, must no longer postpone this issue, as they used to since the 2008 Guidelines. The question regarding the environmental harm of scrubber washwater must be addressed by a neutral scientific body, such as the Intergovernmental Panel on Climate Change (hereinafter IPCC).²²² The IPCC could increase credibility of prior and future scientific research by assessing the environmental research and evaluating where more research is needed. If it is impossible to find a solution to the uncertainty of the environmental harm, the IMO will need to resort to the precautionary principle. Resorting to the precautionary principle to avoid any environmental harm: The [precautionary principle addresses the uncertainty of environmental harm, and the uncertainty of science.²²³ This principle is based on several elements.²²⁴ (1) Scientific uncertainty shall not be a reason for continuing environmental harm.²²⁵ While states' reports on scrubber washwater does increase scientific uncertainty, this uncertainty should not restrain the law from protecting the marine environment.²²⁶ (2) There is a necessity to explore alternatives to harmful

221. *Future Brief*. EUROPEAN COMMISSION, SCIENCE FOR ENVIRONMENT POLICY (2017), <http://ec.europa.eu/science-environment-policy>.

222. *About the IPCC*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, <https://www.ipcc.ch/about/>.

223. Steve Maguire and Jaye Ellis, *Redistributing the Burden of Scientific Uncertainty: Implications of the Precautionary Principle for State and Nonstate Actors*, 11 GLOBAL GOVERNANCE 505, 518 (2005); see Natasha Geiling, *Can the Precautionary Principle Save the Endangered Species Act from an Uncertain Climate Future?* 47 ECOLOGY L. Q. 305, 326 (2020); see also Annecoos Wiersema, *Adversaries or Partners? Science and the Precautionary Principle in International Wildlife Treaty Regimes*, 11 J. INT'L WILDLIFE, & POL'Y, 211, 222 (2008).

224. David Kriebel et al, *The Precautionary Principle in Environmental Science*, 109 (9) ENV'T HEALTH PERSP. 871 (2001).

225. Andreas Fischlin, *Scientific and Political Drivers for the Paris Agreement*, 3-8 in THE PARIS AGREEMENT ON CLIMATE CHANGE: ANALYSIS AND COMMENTARY, (Daniel Klein, et al. eds., 2017); see also Elizabeth A Kirk, *Science and the International Regulation of Marine Pollution*, in THE OXFORD HANDBOOK OF THE LAW OF THE SEA (Donald Rothwell, et al. eds., 2014).

226. DANIEL BODANSKY ET AL., INTERNATIONAL CLIMATE CHANGE LAW 128 (2017).

substances or materials to the environment.²²⁷ Ships can use alternative fuels instead of scrubbers to avoid potential harm.²²⁸ (3) The precautionary principle adds a new burden of proof.²²⁹ The principle shifts the burden of proof to States that wish to continue to use scrubbers to prove there is no harm from their use.²³⁰ This means that countries, like Japan, that wish to continue to use scrubbers must fund the independent research to prove there is no harm from using scrubbers. States should adopt a unified rule related to scrubber washwater. Such a unified law would help to avoid the confusion among ships' owners on the applicable law on scrubber washwater. At the start of January 2020, all ships' owners knew they should lower the emission from their ships to 0.5% to comply with the new IMO regulation.²³¹ However, there is no similar regulation for scrubber washwater. It is true that the 2015 Guidelines include levels to the substance in scrubber washwater. However, there are several critiques to these limits. As mentioned earlier, countries are either regulating scrubber washwater, or not, and not in a unified manner. Currently, more than 45 States have legislation regulating scrubber washwater. The main reason that the States below ban scrubber washwater is the potential environmental harm.²³² The following table includes the names of these countries.²³³ Each country adopts its own legal model that reaches six models due to: (1) the limits mentioned in the 2015 Guidelines have not been reviewed since the 2008 Guidelines; and (2) there are several scientific reports regarding the environmental harm from scrubber washwater.

227. PATRICIA W. BIRNIE ET AL., *BIRNIE, BOYLE & REDGEWELL'S INTERNATIONAL LAW AND THE ENVIRONMENT* 170-183 (4th ed. 2021).

228. Bryan Comer et al., *Air Emissions and Water Pollution Discharges from Ships with Scrubbers*, INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION (Nov. 24, 2020), <https://theicct.org/publication/air-emissions-and-water-pollution-discharges-from-ships-with-scrubbers/>.

229. ALAM, *supra* note 33, at 48.

230. Kevin M. Clermont, *Standards of Proof Revisited*, 33 VT. L. REV. 469, 470-75 (2009).

231. 2017 Guidelines for the implementation for MARPOL Annex V. (Resolution MEPC 295 (71)- adopted on July 7, 2017); *See also* TSIMPLIS *supra* note 58, at 1.

232. ALAM, *supra* note 33, at 48.

233. Damgaard, *supra* note 53, at 1.

Table (6): Countries regulating scrubber washwater:

Argentina	Australia	Belgium	Bermuda	Brazil
Canada	China	Egypt	Finland	France
Germany	Ghana	Hong Kong	India	Ireland
Latvia	Lithuania	Malaysia	Mozambique	New Zealand
Norway	Oman	Pakistan	Panama	Portugal
Qatar	Romania	Saudi Arabia	Singapore	Spain
Sweden	Turkey	United Arab Emirates	United Kingdom	United States
Bahrain	Estonia	Gibraltar	Sweden	

VI. CONCLUSION

This article presented the relevant issues related to scrubber washwater on the national level. These issues include: (1) the lack of clarity surrounding who is in charge of minimizing environmental damage caused by the scrubber washwater, whether it be the Flag State or the Coastal State. There are three aspects to this issue, including (a) the competent authority to mitigate environmental harm and (b) the competent authority to implement the proper mitigation measures. International law does not clearly define the function of the coastal state or flag state. Additionally, it leads to a conflict of laws regarding the prevention of environmental harm, particularly given the scrubber washwater's transnational nature. (2) The lack of certainty in the legal framework used by national authorities to control scrubber washwater. The issue with these various legal frameworks is that they make it more difficult for ship owners to understand the rules that apply to scrubber washwater. At least six divergent legal systems are currently in use on a national scale. These models include (a) a limited ban, (b) an unlimited ban, (c) specific laws to regulate scrubber washwater, (d) general laws to regulate scrubber washwater, (e) legally binding regulations, and (f) legally non-binding

regulations. Additionally, some States enact laws that are only temporary, while others do so before suspending them.

In order to address the uncertainty surrounding the mitigation of environmental harm from scrubber washwater, the research suggests three solutions. These options include (A) the pressing need to address the looming scientific unpredictability. The Japanese, Greek, and Panama reports raise scientific questions that the IMO and national authorities must address. They must report to the second solution if they are unable to do so. (B) Adopting precautionary measures to protect the environment. This legal precept aids in resolving the issue of scientific ambiguity. The adoption of uniform scrubber washwater regulations by the states is recommended. (C) Until there is a credible international opinion about the exact nature of the harm, states can choose between conducting additional scientific research on the environmental harm caused by scrubber washwater and adopting preventative measures to avoid the harm. State adoption of a unified legal scrubber washwater, comparable to the sulfur limit, cannot be delayed at the national level by the states. The current legal system makes the legal status of scrubber washwater more complicated, which national authorities must address successfully.