

# Navigating New Waters: IMO's Efforts to Regulate Autonomous Shipping

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## Abstract

New technological development in autonomous and unmanned vessels challenges the international legal framework prevailing at sea. Currently, the regulations applicable to international shipping constitute regulatory barriers preventing their operation on a worldwide scale. Hence, the International Maritime Organization (IMO), responsible for international shipping, has been working to accommodate these new types of vessels within the existing legal instruments. This paper traces the IMO's steps to establish a new regulatory framework for them.

## I. Introduction

1. Autonomous and unmanned maritime vessels<sup>1</sup> constitute an unprecedented challenge to the entire legal order prevailing at sea.<sup>2</sup> Even though

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- 1 These terms are used in their ordinary meaning in this article; to date, there are no legal definitions of these terms yet.
- 2 Frank Smeele, *Switching Off Regulatory Requirements: Flag State Exemptions as a Tool to Facilitate Experiments with Highly Automated Vessels and Their*

historically<sup>3</sup> the evolution of the law of the sea and international maritime law has been primarily driven by technological progress,<sup>4</sup> the development of these types of vessels challenges the fundamentals of centuries of maritime traditions, customs, and laws (e.g., the presence of the master and crew on board each ship; the responsibility of the master and the officer on watch for the crew, passengers, cargo and the vessel itself; the obligation to provide assistance to persons in distress at sea; and many others). Thus, regardless of the existence and operational capacity of these vessels, there is still no international legal framework enabling their global navigation.<sup>5</sup>

2. Various legal solutions have been proposed to resolve the emerging compliance problems under the existing regulatory framework.<sup>6</sup> The great

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Operational Implementation, in Henrik Ringbom, Erik Røsæg, & Trond Solvang (eds.), *Autonomous Ships and the Law* (2021), 69.

- 3 For interesting analyses on the historical development of the law of the sea from the perspective of the Third World States and with the Third World Approaches to International Law (TWAAIL), refer to: Endalew Lijalem Enyew, *Sailing with TWAAIL: A Historical Inquiry into Third World Perspectives on the Law of the Sea*, 21 *Chinese JIL* (2022), 439.
- 4 Aldo Chircop, *Testing International Legal Regimes: The Advent of Automated Commercial Vessels*, 60 *German YIL* (2018), 1.
- 5 Already in 2015 (Wallach) and in 2018 (Liu), it was emphasized that autonomous and unmanned vessels would be ready much sooner than the relevant legal regulations Wendell, Wallach, *A Dangerous Master: How to Keep Technology from Slipping Beyond Our Control* (2015), 251; Donald Liu, *Autonomous Vessel Technology, Safety, and Ocean Impacts*, in Werle Dirk et al. (eds.), *The Future of Ocean Governance and Capacity Development* (2018), 493.
- 6 Allen H., Craig, *The Seabots Are Coming Here: Should They Be Treated as 'Vessels'?*, 65 *J. Navigation* (2012), 749-752; Yen-Chiang Chang, Chao Zhang & Nannan Wang, *The International Legal Status of the Unmanned Maritime Vehicles*, 113 *Marine Policy* (2020), 1-7; Ryan Hagemann, Jennifer, Huddleston Skees, & Adam, Thierer, *Soft Law for Hard Problems: The Governance of Emerging Technologies in an Uncertain Future*, 17 (2018), 37-130; Måns Jacobsson, *What Challenges Lie Ahead for Maritime Law?*, in Mukherjee, Proshanto K., Mejia, Maximo Q., & Xu, Jingjing (eds.), *Maritime Law in Motion* (2020), 257-287; Barbara Stępień, *Yara Birkeland and the Legal Problems of Autonomous Shipping*, 104 *Boletim Da Sociedade Brasileira de Direito Internacional* (2018), 403-427; Gary E. Marchant & Brad Allenby, *Soft Law: New Tools for Governing Emerging Technologies*, 73 *Bulletin of the Atomic Scientists* (2017), 108-114; Alexandros X. M. Ntovas, *Functionalism and Maritime Autonomous Surface Ships*, in James Kraska & Young-Kil Park (eds.), *Emerging Technology and the Law of the Sea* (2022), 214-242; Thomas Porathe et al., *At least as safe as manned shipping? Autonomous shipping, safety and "human error", in Safety and Reliability—Safe Societies in Anne Barros et al. (eds.), A Changing World* (2018), 417-425; Anna Petrig, *Unconventional Law for Unconventional*

importance of the International Maritime Organization (IMO) in this context has been noted,<sup>7</sup> which has been challenged by the growing relevance of autonomous and unmanned vessels over the last few years.<sup>8</sup> Thus, the Organization started working, mainly *via* its specialized Committees, on accommodating the autonomous and unmanned vessels within the current applicable legal framework under its purview. However, it remained unknown how the IMO exactly planned to solve the issue of autonomous and unmanned vessels until 2021. Then, it finally decided to prepare a non-mandatory “Goal-Based Instrument for MASS” (GBS MASS Code), but the real work on it was not started until 2022. And it has continued until 2024.

3. This paper aims to trace the IMO’s steps to regulate autonomous and unmanned vessels. Thus, the analysis is divided into four main sections, where the chronological developments are offered. In the first part, IMO’s structure and functioning are presented to set the scene for the subsequent parts of the article. The analysis begins in 2015 when the first traces of Maritime Autonomous Surface Ships (MASS) before IMO are offered. Then, I analyze the work’s evolution during the Regulatory Scoping Exercises before the respective IMO Committees (2018–2021). Consequently, I demonstrate the IMO’s advancements on the non-mandatory GBS MASS Code (2022–2024). After each section, the milestones achieved by IMO are explained. Finally, the paper closes with concluding remarks regarding the analysis conducted showing the regulatory *status quo* and future challenges for IMO.

## II. Overview of IMO Bodies and Committees Shaping MASS Regulations

4. The International Maritime Organization, a United Nations (UN) specialized agency, is the leading international regulatory organization responsible for shipping-related matters.<sup>9</sup> Born as the Inter-Governmental Maritime

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Ships? The Role of Informal Law in the International Maritime Organization’s Quest to Regulate Maritime Autonomous Surface Ships, in Natalie Klein (ed.), *Unconventional Lawmaking in the Law of the Sea* (2022), 112–136; Barbara Stepień, Can a Ship Be Its Own Captain? Safe Manning of Autonomous and Uncrewed Vessels, 148 *Marine Policy* (2023), 105451; Aldo Chircop, above n. 4; Donald Liu, above n. 5.

7 Anna Petrig, above n. 6 at 120.

8 Måns Jacobsson, above n. 6 at 281.

9 David A. Wirth, Environment, in Jacob Katz Cogan, Ian Hurd, & Ian Johnstone (eds.), *The Oxford Handbook of International Organizations* (2016), 429. To

Consultative Organization (IMCO) based on the IMCO Convention adopted in 1948,<sup>10</sup> it changed its name to the current form in 1982.<sup>11</sup> Almost all of the world's States (175), accounting for approximately 97.70% of the world's tonnage,<sup>12</sup> including all significant maritime powers,<sup>13</sup> are members.

5. The primary function of the IMO is to provide mechanisms for inter-governmental cooperation in regulating technical aspects of international merchant shipping and to promote the highest safety and security standards.<sup>14</sup> Moreover, among other things, the IMO facilitates information exchange among governments on matters under its purview.<sup>15</sup> In this way, IMO has the competence to regulate the problem of autonomous and unmanned vessels, adjust the existing regulatory framework to developing technologies, and create new legal solutions to enable global MASS navigation.

6. IMO comprises the following bodies: an Assembly, a Council, and a Secretariat, together with five specialized Committees, namely a Maritime Safety Committee (MSC), a Legal Committee (LEG), a Marine Environment Protection Committee (MEPC), a Facilitation Committee (FAL), and a Technical Cooperation Committee (TCC).<sup>16</sup> Additionally, it can establish any subsidiary bodies considered necessary at any time.<sup>17</sup>

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better understand the impact of international organizations on international law, especially those within the UN system, see: José E. Alvarez, *The Impact of International Organizations on International Law* (2017).

10 Over the years, the 1948 Convention on the Inter-Governmental Maritime Consultative Organization was amended nine times by the following amendments: A.69(ES.II) of 15 September 1964, A.70(IV) of 28 September 1965, A.315(ES.V) of 17 October 1974, A.358(IX) of 14 November 1975, A.400(X) of 17 November 1977, A.450(XI) of 15 November 1979, A.724(17) of 7 November 1991, A.735(18) of 4 November 1993 and A.1152(32) of 8 December 2021. *International Maritime Organization, IMO Basic Documents I* (2023), 2.

11 Since 1982 it has been referred to as the 1948 IMO Convention. Francis Lyall, *Technology, Sovereignty and International Law* (2022), 36.

12 *International Maritime Organization, Global Integrated Shipping Information System (GISIS)*, available at: <https://gisis.imo.org/Public/ST/Treaties.aspx> (last visited July 6, 2023).

13 Harilaos N. Psarftis & Christos A. Kontovas, *Influence and Transparency at the IMO: The Name of the Game*, 22 *Marit Econ Logist* (2020), 154.

14 IMO Convention, art. 1a.

15 *Ibid.*, art. 1 b-e.

16 Given that the Technical Cooperation Committee has so far not been engaged in the MASS-related regulatory activities of the IMO, its functions are not presented in this article.

17 IMO Convention, above n. 10, art. 11.

7. *Assembly*. All IMO Members, Associate Members and other Participants compose the Assembly,<sup>18</sup> which performs multiple functions.<sup>19</sup> Among other things, the Assembly makes recommendations for Members related to adoption, regulations, and guidelines on maritime safety and marine pollution, and promotes technical cooperation.<sup>20</sup> It operates based on the Rules of Procedure of the Assembly.<sup>21</sup>

8. *Council*. The Council comprises forty Member Governments elected by the Assembly.<sup>22</sup> Its main functions include evaluating the draft work program and budget estimates prepared by the Secretary-General considering proposals of various committees and bodies of the IMO. Among other things, the Council prepares the IMO's work program and budget to submit it to the Assembly, considering the IMO's general interest and priorities.<sup>23</sup> Moreover, it receives reports, proposals, and recommendations from IMO's committees and bodies, along with its comments and recommendations, and passes them to the Assembly and, when the Assembly is not in session, to the Members.<sup>24</sup> Finally, the Council assumes all the IMO's functions between the Assembly's sessions, except for making recommendations on the adoption, regulations, and guidelines on maritime safety and pollution prevention,

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18 Ibid., art. 12, Rules of Procedure of the Assembly, Rule 1.1-2.

19 As enumerated in the IMO Convention, above n. 10, art. 15 a-h.

20 Ibid., art. 15 i-l.

21 The Assembly adopted the original text of the Rules of Procedure by its resolution A.27(II) of 13 April 1961. Over the years, the Rules were amended by the following resolutions: A.72(IV) of 28 September 1965, A.111(V) of 17 October 1967, A.354 (IX) of 13 November 1975, A.780(19) of 13 November 1995, A.781(19) of 13 November 1995, and A.1154(32) of 8 December 2021. The Rules were also amended by the Assembly's decisions at its sixth session on 15 October 1969, its eighth session on 23 November 1973, its ninth session on 14 November 1975, its tenth session on 17 November 1977, its eleventh session on 6 November 1979, its fourteenth session on 20 November 1985, its twenty-sixth session on 23 November 2009, its twenty-seventh session on 23 November 2011, its twenty-ninth session on 24 November 2015, and its thirty-first session on 27 November 2019. International Maritime Organization, above at n. 10, 33.

22 IMO Convention, above n. 10, art. 16. However, this provision was recently amended by Assembly Resolution A.1152(32) according to which the Council shall be composed of fifty-two Members (although, at the time of writing this article, the cited amendment has not yet entered in force). Rules of Procedure of the Council, Rule 1.

23 IMO Convention, above n. 10, art. 21.

24 Ibid., art. 21.

which are reserved for the Assembly.<sup>25</sup> Like the other IMO bodies, the Council operates based on its Rules of Procedure.<sup>26</sup>

9. *Secretariat*. The Secretariat is composed of the Secretary-General, who is the Chief administrative officer of the IMO, and other necessary personnel.<sup>27</sup> The primary function of the Secretariat is to maintain the essential records for the efficient execution of the IMO's functions. Moreover, it compiles and circulates the necessary papers, documents, agendas, minutes, and any essential information for the IMO's operations.<sup>28</sup> The Secretary-General is mandated to prepare the financial statements for each year and the budget estimates and present them to the Council.<sup>29</sup> The Secretary-General also keeps all the Members informed regarding the IMO's activities.<sup>30</sup>

10. *Maritime Safety Committee*. The Maritime Safety Committee (MSC) comprises all the IMO Members and other Participants.<sup>31</sup> Its principal function is to analyze any issue within the IMO purview related to navigational aids, vessels' construction and equipment, manning, collision prevention regulations, handling of dangerous goods, maritime safety procedures and requirements, hydrographical information, navigational records, investigations of marine accidents, salvage and rescue, and all the other matters

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25 Ibid., art. 26.

26 The Council adopted the original text of the Rules of Procedure at its fourth session on 18 January 1961. Over the years, the Rules were amended several times at its eighth session on 21 May 1963, at its thirteenth session on 17 September 1964, at its fifteenth session on 28 September 1965, at its eighteenth session on 30 June 1967, at its twenty-third session on 29 October 1969, at its thirty-sixth session on 9 June 1976, at its forty-second session on 21 May 1979, at its fifty-second session on 11 June 1984, at its eighty-ninth session on 25 November 2002, at its 102nd session on 3 July 2009, at its 105th session on 4 November 2010, at its 106th session on 28 June 2011, at its 110<sup>th</sup> session on 15 July 2013, at its 117th session on 5 December 2016, at its 118th session on 26 July 2017 and at its 34th extraordinary session on 11 November 2021. International Maritime Organization, above n. 10, 53.

27 IMO Convention, above n. 10, art. 52. Resolution C.74(86) adopted on 22 June 2001 regulates the Secretary-General appointment. International Maritime Organization, above n. 10, 67.

28 IMO Convention, above n. 10, art. 53.

29 Ibid., art. 54.

30 Ibid., art. 55.

31 Ibid., art. 27, Rules of Procedure of Maritime Safety Committee (Rules of Procedure of the MSC), Rule 1.

directly related to and impacting maritime safety.<sup>32</sup> MSC also submits to the Council proposals for safety regulations and for amendments, recommendations and guidelines it has drafted, and reports on its work.<sup>33</sup> Therefore, MSC has been the central Committee engaged in the MASS-related regulatory activities of the IMO, leading the Organization's work on this matter. The functioning of the MSC is based on the Rules of Procedure of the Maritime Safety Committee.<sup>34</sup>

11. *Legal Committee.* The Legal Committee (LEG), like the MSC, comprises all IMO Members and other Participants,<sup>35</sup> and its main function is to examine any legal matters under the purview of the IMO.<sup>36</sup> LEG presents drafts of international conventions and amendments to the Council, as well as reports on their work.<sup>37</sup> Thus, it has also been actively involved in the IMO regulatory works on autonomous and unmanned vessels. LEG also operates based on the Rules of Procedure of the Legal Committee.<sup>38</sup>

12. *Marine Environment Protection Committee.* The Marine Environment Protection Committee (MEPC), as the other Committees, consists of all the IMO Members and other Participants,<sup>39</sup> and is responsible for any matter

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32 IMO Convention, above n. 10, art. 28a.

33 *Ibid.*, art. 29.

34 The MSC adopted the original text of the Rules of Procedure at its fifth session on 10 January 1962. Over the years, the Rules were amended several times at its tenth session on 5 May 1965, at its twelfth session on 31 January 1966, at its twentieth session on 29 October 1969, at its thirty-fourth session on 6 May 1976, at its thirty-ninth session on 25 September 1978, at its forty-first session on 11 October 1979, at its fiftieth session on 30 November 1984, at its seventy-ninth session on 8 December 2004 and at its eighty-sixth session on 3 June 2009. The revised Rules of Procedure were adopted at its ninety-eighth session on 14 June 2017. International Maritime Organization, above n. 10, 71.

35 IMO Convention, above n. 10, art. 32, Rules of Procedure of the Legal Committee (Rules of Procedure of the LEG), Rule 1.

36 IMO Convention, above n. 10, art. 33.

37 *Ibid.*, art. 34.

38 The LEG adopted the original text of the Rules at its forty-eighth session on 4 March 1982. Over the years, the Rules were amended several times at its fifty-second session on 13 September 1984, at its eightieth session on 14 October 1999, at its eighty-ninth session on 29 October 2004, at its ninety-fifth session on 2 April 2009 and at its 100th session on 17 April 2013. The revised Rules of Procedure were adopted at its 104th session on 27 April 2017. International Maritime Organization, above n. 10, 87.

39 IMO Convention, above n. 10, art. 37, Rules of Procedure of Marine Environment Protection Committee (Rules of Procedure of the MEPC), Rule 1.

under the purview of the IMO related to prevention and control of marine pollution resulting from shipping.<sup>40</sup> Consequently, it submits to the Council proposals for regulations on preventing and controlling marine pollution from ships and for amendments, drafts recommendations and guidelines, and reports on its work.<sup>41</sup> Given that the operation of the autonomous and unmanned vessels will also impact the marine environment, this Committee should also be involved in the works on the MASS regulations. The Rules of Procedure of the Marine Environment Protection Committee regulate the Committee's functioning.<sup>42</sup>

13. *Facilitation Committee.* The Facilitation Committee (FAL), the last IMO Committee presented in the article, is also composed of all the IMO Members and other Participants.<sup>43</sup> FAL is responsible for any matter within the scope of the IMO related to the facilitation of international maritime traffic.<sup>44</sup> The Committee presents recommendations and guidelines to the Council that it has drafted and reports on its work.<sup>45</sup> For these reasons, FAL is also working on regulations for autonomous and unmanned vessels. The Rules of Procedure of the Facilitation Committee regulate its functioning.<sup>46</sup>

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40 IMO Convention, above n. 10, art. 38.

41 *Ibid.*, art. 39.

42 The MEPC adopted the original text its Rules of Procedure at its first session on 8 March 1974. Over the years, the Rules were amended several times by the Committee at its fifth session on 28 May 1976, at its twelfth session on 26 November 1979, at its seventeenth session on 26 June 1982, at its twenty-second session on 6 December 1985, at its fifty-second session on 15 October 2004 and at its sixtieth session on 26 March 2010. The revised Rules of Procedure were adopted by the Committee at its seventieth session on 27 October 2016 and at its seventy-first session on 5 July 2017. International Maritime Organization, above n. 10, 103.

43 IMO Convention, above n. 10, art. 47. Rules of Procedure of the Facilitation Committee (Rules of Procedure of the FAL), Rule 1.

44 IMO Convention, above n. 10, art. 48.

45 *Ibid.*, art. 49.

46 The Rules of Procedure were adopted by the FAL Committee at its thirty-fifth session held on 12 January 2009. Subsequently, the revised Rules of Procedure were adopted at the forty-first session of the Committee on 5 April 2017 and at its forty-second session on 7 June 2018. International Maritime Organization, above n. 10, 135.

### III. IMO works on Maritime Autonomous Surface Ships (MASS)

#### III.A. The First Traces of MASS before IMO (2015 – 2017)

14. The topic of autonomous and unmanned systems emerged for the first time before the IMO in 2015, when the United Kingdom, together with the International Association of Institutes of Navigation (IAIN) and the Institute of Marine Engineering, Science and Technology (IMarEST) submitted the document “IMO Regulatory Framework and its Application to Maritime Autonomous Systems” before the IMO Maritime Safety Committee (MSC) at its 95<sup>th</sup> session (MSC 95).<sup>47</sup> The co-sponsors expressed therein their position regarding the emerging need to regulate autonomous and unmanned vessels within the applicable legal framework established by the IMO. MSC 95 noted the presented opinion, but no further action was taken in this respect.<sup>48</sup>

15. In 2016, the issue of maritime autonomous systems gained more prominence in the IMO due to the activities of the Working Group on the Development of a New Strategic Framework of the Organization, where the Member States underscored, among other things, the progress in the development of autonomous maritime systems and the need to start IMO’s work on this subject.<sup>49</sup>

16. In 2017, during its 98<sup>th</sup> session (MSC 98), held on June 7-16, the Maritime Safety Committee acknowledged the progress in MASS development and recognized that the IMO should be proactive and assume leadership in regulating it.<sup>50</sup> MSC 98 also considered the document “Maritime Autonomous Surface Ships: Proposal for a regulatory scoping exercise” submitted jointly by Denmark, Estonia, Finland, Japan, the Netherlands, Norway, the Republic of Korea, the United Kingdom, and the United States.<sup>51</sup> The aim of the Regulatory Scoping Exercise (RSE) would be

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47 IMO Maritime Safety Committee, MSC 95/INF.20: The IMO Regulatory Framework and Its Application to Marine Autonomous Systems (2015). This document and other International Maritime Organization documents and reports are available at: <https://docs.imo.org/>.

48 IMO Maritime Safety Committee, MSC 95/22: Report of the Maritime Safety Committee on Its Ninety-Fifth Session (2015), para. 21.30.4.

49 Anita Mäkinen, *Elements for the Future Strategy of IMO in 2018-2023* (2016), 11.

50 IMO Maritime Safety Committee, MSC 98/23: Report of the Maritime Safety Committee on Its Ninety-Eighth Session (2017), para. 20.2.1.

51 Denmark et al., *MSC 98/20/2: Maritime Autonomous Surface Ships - Proposal for a Regulatory Scoping Exercise* (2017).

to verify “how the safe, secure and environmentally sound operation of Maritime Autonomous Surface Ships (MASS) might be introduced in IMO instruments”.<sup>52</sup> The Committee agreed it would be a complex task, affecting the entire IMO. Particular attention would need to be devoted to issues such as safety and security, environment, pilotage, accidents, and others.<sup>53</sup> During its considerations, MSC 98 noted that the RSE would only be a starting point and further planning of the IMO work plan on MASS would be required.<sup>54</sup> Moreover, the Committee recognized the need to define MASS and distinguish different levels of MASS autonomy, considering different degrees of ship manning.<sup>55</sup>

17. Consequently, MSC 98 decided to include in its biennial agenda for the years 2018-2019 as well as in the provisional agenda for its 99<sup>th</sup> session an item “Regulatory scoping exercise for the use of Maritime Autonomous Surface Ships (MASS)”, with a designated completion date set for the year 2020.<sup>56</sup>

18. At the end of the same year, December 6, 2017, the IMO General Assembly, during its 30<sup>th</sup> session, adopted a Resolution A.1110 (30) on the “Strategic Plan for the Organization for the Six-Year Period 2018 to 2023”, where it recognized the need to “*integrate new and advancing technologies in the regulatory framework*” as the Organization’s strategic direction No. 2.<sup>57</sup>

19. Milestones achieved in regulating MASS during this period:

- (2017) The adoption of Resolution A.1110 (30) on the “Strategic Plan for the Organization for the Six-Year Period 2018 to 2023”, underscored the need to regulate new and advancing technologies, set as Strategic Direction No. 2.
- (2017) The inclusion of the Regulatory Scoping Exercise (RSE) on the provisional agenda of MSC 99 marked a pivotal step toward the integration of MASS into the existing regulatory framework.
- (2015-2017) The emergence of MASS-related international cooperation, as demonstrated by the multi-national proposal at MSC 98, highlighted

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52 IMO Maritime Safety Committee, above n. 50, para. 20.1.

53 Ibid., para. 20.2.2.

54 Ibid., para. 20.2.4.

55 Ibid., para. 20.2.6–7.

56 Ibid., para. 20.2.11.

57 IMO Assembly, Resolution A.1110(30): Strategic Plan for the Organization for the Six-Year Period 2018 to 2023, Annex (2017), paras. 17–19.

the global consensus on the need for regulatory frameworks governing MASS navigation.

### III.B. The Period of RSEs Before IMO (2018 – 2021)

#### *III.B.i Committees' Progress: Year 2018*

20. In 2018, the topic of autonomous and unmanned vessels was also brought to the attention of the IMO Legal Committee (LEG). On April 23-25, 2018, LEG held its 105<sup>th</sup> session (LEG 105), which considered the submission of Canada, Finland, Georgia, the Marshall Islands, Norway, the Republic of Korea, Turkey, CMI, ICS and P&I Clubs. In the document “Proposal for a regulatory scoping exercise and gap analysis with respect to Maritime Autonomous Surface Ships (MASS)”, the co-sponsors indicated the need to analyze regulations and legal gaps in the instruments remaining within the LEG’s purview.<sup>58</sup> The purpose of the analysis was to determine to what extent the international regulatory framework should be modified to accommodate new and evolving MASS technologies.<sup>59</sup> After discussion with the IMO Member States and interested organizations, LEG 105 decided to include a new item “Regulatory scoping exercise and gap analysis of conventions emanating from the Legal Committee concerning Maritime Autonomous Surface Ships (MASS)” in the LEG biennial agenda and provisional agenda of the 106<sup>th</sup> session, with a target completion date in the year 2022.<sup>60</sup>

21. Subsequently, on May 16-25, 2018, the Maritime Safety Committee held its 99<sup>th</sup> session (MSC 99), where the IMO Member States and involved organizations debated on MASS and RSE. Also, the IMO Secretary General, who participated in the session, stressed that MASS represented a significant and huge task for the IMO.<sup>61</sup>

22. Moreover, MSC 99 agreed with the view presented by China and Finland regarding the need to exchange information and experience regarding MASS with other UN agencies and international organizations such as the

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58 Canada et al., LEG 105/11/1: Proposal for a Regulatory Scoping Exercise and Gap Analysis with Respect to Maritime Autonomous Surface Ships (MASS) (2018).

59 IMO Legal Committee, LEG 105/14: Report of the Legal Committee on the Work of Its 105th Session (2018), para. 11.7.

60 *Ibid.*, para. 11.11.1.

61 IMO Maritime Safety Committee, MSC 99/22: Report of the Maritime Safety Committee on Its Ninety-Ninth Session (2018), para. 5.16.

Division for Ocean Affairs and the Law of the Sea of the United Nations Office of Legal Affairs (DOALOS/OLA), the International Labour Organization (ILO), the International Hydrographic Organization (IHO), the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and the International Organization for Standardization (ISO).<sup>62</sup>

23. Among other interesting views expressed, the joint position of the International Federation of Shipmasters' Associations (IFSMA) and the International Transport Workers' Federation (ITF) regarding the RSE is worth mentioning. The co-sponsors suggested, among other things, the possibility of postponing the target date for the completion of the RSE to 2023 and that remotely operated or unmanned ships should not be allowed to make international voyages until applicable international legal standards were adopted and in force.<sup>63</sup> After an in-depth discussion, MSC 99 did not agree to reschedule the target completion date (2020) at this stage but clearly emphasized that it would be updated in the future, given the development of work on the RSE.<sup>64</sup>

24. MSC 99 also agreed, recalling LEG 105's position, that other IMO Committees should review and analyze the instruments within their purview. Therefore, MSC 99 invited the IMO Marine Environment Protection Committee (MEPC) and the IMO Facilitation Committee (FAL) to participate in the RSE by reviewing the regulations within their remit.<sup>65</sup> MSC 99 also decided to act as a coordinator of the work of the Committees involved and to provide them with the necessary information on aspects within their purview that require a broader analysis.<sup>66</sup> Finally, it established a Working Group on MASS aiming, among other things, to develop a framework for the RSE, a work plan, an information exchange mechanism, etc.<sup>67</sup> A MASS Correspondence Group chaired by Finland was also established.<sup>68</sup>

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62 China & Finland, MSC 99/5/7: Regulatory Scoping Exercise for the Use of Maritime Autonomous Surface Ships (MASS) - Proposal on the Work Plan of the Regulatory Scoping Exercise for the Use of MASS, 14 (2018); *Ibid.*, para. 5.17.

63 International Federation of Shipmasters' Associations & International Transport Workers' Federation, MSC 99/5/1: Regulatory Scoping Exercise for the Use of Maritime Autonomous Surface Ships (MASS) - Comments and Proposals on the Way Forward for the Regulatory Scoping Exercise (2018), paras. 20.7–8.

64 IMO Maritime Safety Committee, above n. 61, para. 5.24.

65 *Ibid.*, para. 5.11.

66 *Ibid.*, para. 5.12.

67 *Ibid.*, para. 5.25.

68 *Ibid.*, para. 5.30.

25. On October 22-26, 2018, the Marine Environment Protection Committee, during its 73<sup>rd</sup> session (MEPC 73), considered the invitation of the MSC 99 to participate in the RSE for MASS by reviewing the instruments within its purview.<sup>69</sup> After a discussion and given a substantial workload, MEPC 73 determined to postpone the deliberation of this issue until the MSC achieves significant progress on the RSE.<sup>70</sup> Thus, no further actions regarding MASS were taken by the MEPC at this stage.

26. That year (2018), the Maritime Safety Committee held another session (100<sup>th</sup>), from December 3 to 7, 2018, where it approved the RSE's framework, comprising the plan of work and procedures.<sup>71</sup> The objective of the RSE was also specified as an assessment of "how safe, secure and environmentally sound Maritime Autonomous Surface Ships (MASS) operations might be addressed in IMO instruments".<sup>72</sup> Moreover, the MSC 100 defined MASS as "a ship which, to a varying degree, can operate independent of human interaction".<sup>73</sup> After extensive debate on the identification and definition of the different levels of MASS autonomy, four degrees were agreed upon for the purposes of the RSE<sup>74</sup>: 1) Degree one: Ship with automated processes and decision support; 2) Degree two: Remotely controlled ship with seafarers on board; 3) Degree three: Remotely controlled ship without seafarers on board; and 4) Degree four: Fully autonomous ship.

27. MSC 100 also established the methodology of work on the RSE.<sup>75</sup> Firstly, the provisions in the IMO instruments should be identified that: 1) apply to MASS and prevent MASS operations, or 2) apply to MASS and do not prevent MASS operations and require no actions, or 3) apply to MASS and do not prevent MASS operations but may need to be amended or clarified, and/or may contain gaps, or 4) have no application to MASS operations.<sup>76</sup>

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69 IMO Marine Environment Protection Committee, MEPC 73/19: Report of the Marine Environment Protection Committee on Its Seventy-Third Session (2018), para. 2.2.

70 *Ibid.*, para. 2.3.

71 IMO Maritime Safety Committee, MSC 100/20: Report of the Maritime Safety Committee on Its One Hundredth Session (2019), para. 5.28.

72 IMO Maritime Safety Committee, MSC 100/20/Add.1: Report of the Maritime Safety Committee on Its One Hundredth Session - Annex 2, 1 (2018).

73 *Ibid.*, para. 3.

74 *Ibid.*, para. 4.

75 *Ibid.*, paras. 9–10.

76 *Ibid.*, para. 9.

28. As the second stage of the RSE, MSC 100 planned to perform an analysis and ascertain the optimal approach to address MASS, considering, among other things, the human element, technology, and operational factors through<sup>77</sup>: 1) equivalences as provided for by the instruments or developing interpretations; and/or, 2) amending existing instruments; and/or, 3) developing new instruments; or 4) none of the above as a result of the analysis. Additionally, the Committee invited IMO Member States and interested international organizations to participate in the RSE by voluntarily reviewing selected IMO instruments.<sup>78</sup>

### *III.B.ii Committees' Progress: Year 2019*

29. The IMO Committees' work on MASS in the year 2019 began with the 106<sup>th</sup> session of the Legal Committee (LEG 106) held on March 27-29. LEG 106 considered the framework of the RSE and decided to apply, *mutatis mutandis*, the methodology adopted by MSC 100.<sup>79</sup> LEG 106 also acknowledged that the distinction between the four degrees of autonomy was not particularly relevant in the context of its RSE.<sup>80</sup> Therefore, at this juncture, a simplified approach should be adopted, centering on only two levels of autonomy.<sup>81</sup> Moreover, the Committee examined the list of instruments provided by the Secretariat for the purposes of the RSE.<sup>82</sup> At this stage, it decided not to review the provisions of the 1982 United Nations Convention on the Law of the Sea (UNCLOS) and the 2006 Maritime Labor Convention (MLC), although it noted that it could be necessary in the future.<sup>83</sup> LEG 106 also noted that at some point, it would have to consider the role of the remote operator in terms of liability.<sup>84</sup> Nonetheless, it was recognized that this discussion was outside the scope of the RSE.<sup>85</sup> The

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77 Ibid., para. 10.

78 Ibid., para. 5.28.

79 IMO Legal Committee, LEG 106/16: Report of the Legal Committee on the Work of Its 106th Session (2019), para. 8.5.

80 Ibid.

81 Ibid.

82 Secretariat, LEG 106/8: Regulatory Scoping Exercise and Gap Analysis of Conventions Emanating from the Legal Committee with Respect to Maritime Autonomous Surface Ships (MASS) - List of Instruments Under the Purview of the Legal Committee, Annex (2019).

83 IMO Legal Committee, above n. 79, para. 8.6.

84 Ibid., para. 8.8.

85 Ibid., para. 8.8.

Committee approved the RSE's framework, including the plan of work and procedures,<sup>86</sup> and invited IMO Member States and organizations with observer status to participate in the initial review of the instruments.<sup>87</sup>

30. On April 8-12, 2019, the Facilitation Committee held its 43<sup>rd</sup> session (FAL 43). In light of the previous sessions and the work of the other Committees involved, FAL 43 decided to include the item "Regulatory scoping exercise for the use of maritime autonomous surface ships (MASS)" in its two-year work program for the years 2020-2021, and the provisional agenda of FAL 44, with a completion date in the year 2020.<sup>88</sup> Moreover, FAL 43 decided to employ the framework for RSE developed by MSC 100 and approved the plan of work and procedures for its Regulatory Scoping Exercise.<sup>89</sup>

31. On June 5-14, 2019, the Maritime Safety Committee, during its 101<sup>st</sup> session (MSC 101), endorsed the document "Interim Guidelines for MASS Trials",<sup>90</sup> aimed at ensuring that MASS-related tests of systems and infrastructure are carried out by competent authorities and stakeholders safely, securely and with due regard to environmental protection.<sup>91</sup> Moreover, MSC 101 acknowledged the progress made with the RSE presented in the report of the MASS Working Group and invited the IMO Member States and interested organizations to participate in the RSE.<sup>92</sup>

### *III.B.iii Committees' Progress: Year 2020*

32. Due to the COVID-19 pandemic, the IMO Committees involved, taking into account, among other factors, the limited time available at remote sessions and aiming to ensure the continuity of the work of the Subcommittees, postponed to subsequent sessions most of the items on their

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86 IMO Legal Committee, LEG 106/16: Report of the Legal Committee on the Work of Its 106th Session, Annex 3 (2019).

87 IMO Legal Committee, above n. 79, para. 8.15.

88 IMO Facilitation Committee, FAL 43/20: Report of the Facilitation Committee on Its Forty-Third Session (2019), para. 19.9.1.

89 *Ibid.*, para. 19.9-10; IMO Facilitation Committee, FAL 43/20: Report of the Facilitation Committee on Its Forty-Third Session, Annex 7 (2019).

90 MSC 101/24: Report of the Maritime Safety Committee on its 101st Session (2019), para. 5.21.

91 IMO Maritime Safety Committee, MSC.1/Circ.1604: Interim Guidelines for MASS Trials (2019), para. 1.

92 IMO Maritime Safety Committee, above n. 90, para. 5.18-19.

agendas, including those related to RSE.<sup>93</sup> Therefore, in 2020 no decisions regarding MASS were made by the respective IMO Committees.<sup>94</sup>

### *III.B.iv Committees' Progress: Year 2021*

3. In 2021, the Maritime Safety Committee, during its 103<sup>rd</sup> session (MSC 103), held on May 5-14, approved the results of the Regulatory Scoping Exercise presented in Annex 8 to the session's report.<sup>95</sup> The Committee nevertheless underscored that although it had planned to complete its RSE in May 2020 (during MSC 102), it had been delayed one year due to the COVID-19 pandemic.<sup>96</sup> MSC 103 reiterated that the purpose of the RSE was not to discuss nor make any recommendations on MASS.<sup>97</sup> Moreover, it reiterated that the scope of the RSE had always been limited to the assessment of the extent to which the exploitation of MASS may affect the existing legal regulations of international maritime law (such as the IMO instruments).<sup>98</sup>

34. MSC 103 also indicated that tackling the MASS problem would require a holistic approach.<sup>99</sup> Thus, the Committee suggested as a possible solution the adoption of a goal-based instrument for MASS. Although it further noted that even adopting a new MASS instrument may still foster amendments to the current IMO instruments.<sup>100</sup> Therefore, the Committee suggested that the MASS Working Group should consider analyzing the operation of MASS in individual IMO instruments and, for this purpose, consider the results presented in

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93 IMO Legal Committee, LEG 107/18/2: Report of the Legal Committee on the Work of Its 107th Session (2020), para. 8.7; IMO Maritime Safety Committee, MSC 102/24: Report of the Maritime Safety Committee on Its 102nd Session (2020), paras., 1.13, 5.1; IMO Facilitation Committee, FAL 44/21/1: Report of the Facilitation Committee on Its Forty-Fourth Session (2020), para. 1.16.

94 Postponement of sessions due to the COVID-19 pandemic occurred in the case of various international organizations and bodies, for example, the International Law Commission. Sean D. Murphy, *Peremptory Norms of General International Law (Jus Cogens) (Revisited) and Other Topics: The Seventy-Third Session of the International Law Commission*, 117 *American JIL* (2023), 92; Sean D. Murphy, *Effects of the COVID-19 Pandemic on the Work of the International Law Commission*, 114 *American JIL* (2020), 726.

95 IMO Maritime Safety Committee, MSC 103/21: Report of the Maritime Safety Committee on Its 103rd Session (2021), para. 5.45.

96 *Ibid.*, para. 5.2.

97 *Ibid.*, para. 5.3.

98 *Ibid.*, para. 5.3.

99 *Ibid.*, para. 5.47.

100 *Ibid.*, para. 5.47.

Tables 3-5 of the results of the Regulatory Scoping Exercise,<sup>101</sup> divided into high, medium, and low priority instruments.<sup>102</sup> Consequently, MSC 103 asked the IMO Member States to come up with the proposals for best practices and to share their experience with MASS operations.<sup>103</sup> Concluding this point of the session, MSC 103 commented that although “this was only the beginning of a long way to go” to enable MASS operation under the regulatory framework established by the IMO, the completion of the RSE was an extremely important first step in guiding further discussion to ensure that regulations remain aligned with technological advancements.<sup>104</sup>

35. On June 1-7, 2021, the Facilitation Committee held its 45<sup>th</sup> session (FAL 45) which, however, did not bring any significant developments in the context of MASS. Due to the limited time of the session, FAL 45 postponed the consideration of agenda item No. 15 on the “Regulatory scoping exercise for the use of maritime autonomous surface ships (MASS)” to the 46<sup>th</sup> session of the Committee.<sup>105</sup> FAL 45 authorized the Intersessional Working Group on MASS and invited it to complete the Regulatory Scoping Exercise for the FAL Convention in the inter-sessional period of the FAL Committee, considering the instructions provided.<sup>106</sup>

36. On July 26-30, 2021, the Legal Committee held its 108<sup>th</sup> session (LEG 108). Therein, the Committee approved the results of the RSE presented in Annex 2 to the session’s report “Outcome of the Regulatory Scoping Exercise and Gap Analysis of Conventions Emanating from the Legal Committee with Respect to Maritime Autonomous Surface Ships (MASS)”.<sup>107</sup> It was agreed that it would be possible to adapt the existing regulatory framework, within the remit of LEG, without major amendments to the existing regulations.<sup>108</sup> The results of the RSE showed that some conventions may allow MASS to operate in their current version, while others may require additional

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101 IMO Maritime Safety Committee, MSC 103/21: Report of the Maritime Safety Committee on Its 103rd Session, Annex 8 (2021).

102 IMO Maritime Safety Committee, above n. 95, para. 5.47.

103 *Ibid.*, para. 5.48.

104 IMO Maritime Safety Committee, above no. 101, para. 5.49.

105 IMO Facilitation Committee, FAL 45/22 Report of the Facilitation Committee on Its Forty-Fifth Session (2021), para. 1.6.

106 *Ibid.*, para. 1.7.

107 IMO Legal Committee, LEG.1/Circ.11: Outcome of the Regulatory Scoping Exercise and Gap Analysis of Conventions Emanating from the Legal Committee with Respect to Maritime Autonomous Surface Ships (MASS) (2021).

108 *Ibid.*, para. 4.2.

interpretations or amendments to address potential issues revealed during the RSE<sup>109</sup> (such as the role and responsibilities of the master and remote operator; general liability issues; consistent definitions and MASS terminology, etc.).<sup>110</sup> Additionally, it was noted that international conventions not adopted under the auspices of IMO, such as UNCLOS and MLC, may require consideration in future IMO work on MASS, in the case of IMO's development of an instrument to regulate the operation of MASS.<sup>111</sup>

37. On October 4-8, 2021, the Maritime Safety Committee, during its 104<sup>th</sup> session (MSC 104) after an in-depth discussion on MASS, decided to prepare a "Roadmap" on the extent, phases, and timetable, including the collaboration with the other IMO bodies involved, needed for the development of a new item on MASS.<sup>112</sup> The "Roadmap" should be ready for the next session of the Committee (MSC 105) to allow further joint action to be agreed upon. In the context of time constraints, MSC 104 also considered the possibility of starting work on the abovementioned instrument at the next session of MSC No. 105. According to MSC 104, the ultimate objective would be drafting a mandatory instrument related to the operation of MASS.<sup>113</sup> MSC 104 also included in its biennial agenda for the years 2022-2023 and the provisional agenda for the next—the 105<sup>th</sup>—session a new outcome with the working title "Development of a Goal-Based instrument for Maritime Autonomous Surface Ships (MASS)" (GBS MASS Code) with the target completion date in 2025.<sup>114</sup>

38. On November 22-26, 2021, the Marine Environment Protection Committee during its 77<sup>th</sup> session (MEPC 77), considered the Russian Federation's position regarding the results of the "Regulatory Scoping Exercise" for MASS conducted by MSC and LEG Committees. Therein, Russia proposed that the MEPC should also conduct an analysis of possible issues arising from the operation of MASS under the existing legal instruments within its purview.<sup>115</sup> Consequently, the MEPC 77 invited interested Member States and

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109 *Ibid.*, para. 4.

110 *Ibid.*, para. 5.

111 *Ibid.*, para. 3.7-8.

112 IMO Maritime Safety Committee, MSC 104/18: Report of the Maritime Safety Committee on Its 104th Session (2021), para. 15.9.1.

113 *Ibid.*, para. 15.9.4.

114 *Ibid.*, para. 15.9.2.

115 IMO Marine Environment Protection Committee, MEPC 77/16: Report of the Marine Environment Protection Committee on Its Seventy-Seventh Session (2021), para. 14.1.4.

international organizations to present observations and concrete proposals at its future session regarding the work related to MASS (such as possible working arrangements and/or a preliminary working plan).<sup>116</sup>

39. Milestones achieved in regulating MASS during this period:

- (2018) The Maritime Safety Committee, during its 100<sup>th</sup> session, approved its RSE's framework, comprising the work plan and procedures.<sup>117</sup> It established a structured approach for future assessments of MASS within the IMO's regulatory context.
- (2019) The Legal Committee, during its 106<sup>th</sup> session, approved its RSE's framework, comprising the work plan and procedures.<sup>118</sup> This important step marked a commitment to align legal frameworks with technological advancements in maritime navigation.
- (2019) The Facilitation Committee, during its 43<sup>rd</sup> session, approved its RSE's framework, comprising the work plan and procedures,<sup>119</sup> which reinforced the collaboration across IMO Committees to ensure a comprehensive regulatory scope.
- (2021) The Maritime Safety Committee, during its 103<sup>rd</sup> session, approved the results of its Regulatory Scoping Exercise.<sup>120</sup> This milestone established a foundation for MASS integration within the existing regulatory framework and identified areas requiring further attention.
- (2021) The Legal Committee, during its 108<sup>th</sup> session, approved the results of its Regulatory Scoping Exercise,<sup>121</sup> which demonstrated the adaptability of the selected legal instruments to accommodate MASS and highlighted the necessity for future amendments or interpretations.

### III.C. Non-Mandatory GBS MASS Code (2022 – 2024)

#### *III.C.i Committees' Progress: Year 2022*

40. On March 21—April 5, 2022, the Legal Committee, during its 109<sup>th</sup> session (LEG 109) acknowledged that it was necessary to consider the MASS

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116 *Ibid.*, para. 14.6.

117 IMO Maritime Safety Committee, above n. 71, para. 5.28.

118 IMO Legal Committee, above no. 79.

119 IMO Facilitation Committee, above n. 88, paras. 19.9–10; IMO Facilitation Committee, above n. 89.

120 IMO Maritime Safety Committee, above n. 101, para. 5.45.

121 IMO Legal Committee, above n. 107.

operation in instruments within its purview.<sup>122</sup> Among other considerations, LEG 109 agreed that the human factor must also be taken into account, as well as that the MASS operation must be accommodated within the legal framework deriving from UNCLOS (as underscored in the “Outcome of the Regulatory Scoping Exercise and Gap Analysis of Conventions emanating from the Legal Committee with respect to MASS”<sup>123</sup>).<sup>124</sup> On the latter subject, the representative of the Division for Ocean Affairs and the Law of the Sea of the United Nations (UN DOALOS) stated that UN DOALOS was carefully following the IMO’s work on MASS.<sup>125</sup> Moreover, the representative stressed that the Division hopes that IMO will continue to contemplate the uniform and consistent enforcement of UNCLOS provisions in its work on MASS. Even though UN DOALOS sought its greater involvement as the work of IMO progresses, the representative emphasized that it remained in the power of the States Parties to UNCLOS to interpret its provisions.<sup>126</sup> Finally, LEG 109 decided to include in its biennial agenda for the years 2022-2023 (and subsequently in the following agenda for the years 2024-2025) the development of a new document on “Measures to address maritime autonomous surface ships (MASS) in the instruments under the purview of the Legal Committee”, to be ready as of 2025.<sup>127</sup> Additionally, LEG 109 agreed to support the creation of the MSC-LEG-FAL Joint Working Group on MASS (MASS-JWG).<sup>128</sup>

41. On April 20-29, 2022, the Maritime Safety Committee at its 105<sup>th</sup> session (MSC 105) decided to initially develop a non-mandatory Goal-Based MASS Code.<sup>129</sup> At first, it should be applicable only to cargo vessels while its usage also in the context of passenger ships would be evaluated at a later stage, considering the experience gained from its application to cargo ships.<sup>130</sup> Thus, the MASS Working Group decided to make every effort to allow the

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122 IMO Legal Committee, LEG 109/16/1: Report of the Legal Committee on the Work of Its 109th Session (2022), para. 13.8.

123 IMO Legal Committee, above n. 107, para 3.8.

124 IMO Legal Committee, above n. 122, para. 13.8.

125 *Ibid.*

126 *Ibid.*

127 *Ibid.*, para. 13.9.1.

128 *Ibid.*, para. 13.14.1.

129 IMO Maritime Safety Committee, MSC 105/20: Report of the Maritime Safety Committee on Its 105th Session, para. 7.11.

130 *Ibid.*, paras. 7.11.2, 7.23.

entry into force of the mandatory GBS MASS Code by January 1, 2028, despite the limited timeframe to gather practical insights in application of the voluntary Code.<sup>131</sup> MSC 105 also approved the “Road map for developing a goal-based Code for MASS”, presented in Annex 28 to the session’s report.<sup>132</sup> However, it was stressed that the “Roadmap” should be regarded as a “living” document which may need periodic updates and revisions in the future. Moreover, the Committee underscored that the working plan may also be subject to modifications as the draft GBS MASS Code progresses.<sup>133</sup>

42. Moreover, MSC 105 considered the proposals of the Chairmen of the MSC, LEG, and FAL Committees regarding the installation of a joint group as soon as possible after the 127<sup>th</sup> session of the IMO Council (C 127). Consequently, the Committee decided to convene the first meeting of the Joint MSC/LEG/FAL Working Group on Maritime Autonomous Surface Ships (MASS) on September 7-9, 2022 (if simultaneously approved by FAL 46 and C 127).<sup>134</sup> Additionally, a MSC MASS Correspondence Group chaired by the Marshall Islands was established, given the need to advance work on MASS between the sessions of the Committee.<sup>135</sup>

43. On May 9-13, 2022, the Facilitation Committee, during its 46<sup>th</sup> session (FAL 46), approved the “Outcome of the Regulatory Scoping Exercise and gap analysis of FAL Convention with respect to MASS”<sup>136</sup> delivered by the Intersessional Working Group<sup>137</sup> and the installation of the Joint MSC-LEG-FAL Working Group on MASS.<sup>138</sup> Moreover, FAL 46 decided to include, in its biennial agenda for the years 2022-2023 and the preliminary agenda of the next session, a deliverable entitled “Measures to address maritime autonomous surface ships (MASS) in the instruments under the purview of the Facilitation Committee”, with a desired completion date of 2025.<sup>139</sup>

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131 *Ibid.*, para. 7.23.

132 IMO Maritime Safety Committee, MSC 105/20/Add.2: Report of the Maritime Safety Committee on Its 105th Session, Annex 28 (2022).

133 IMO Maritime Safety Committee, above n. 129, para. 7.24.

134 *Ibid.*, para. 7.25.

135 *Ibid.*, para. 7.31.

136 Initially, the completion date was planned for 2020. IMO Facilitation Committee, above n. 89, para. 19.9.1.

137 IMO Facilitation Committee, FAL 46/24: Report of the Facilitation Committee on Its Forty-Sixth Session (2022), para. 14.8.

138 *Ibid.*, para. 14.17.

139 *Ibid.*, para. 14.11.

As a consequence, FAL 46 invited the IMO Member States and international organizations to participate in the work on the above instrument.<sup>140</sup>

44. On September 7-9, 2022, the MSC-LEG-FAL Joint Working Group held its first session (MASS-JWG 1), which agreed on an approach to common issues identified during the RSE conducted by the three Committees involved.<sup>141</sup> Consequently, after discussion, a “Table for the Identification of the Preferred Option for Addressing MASS Common Issues of the MSC, LEG and FAL Committee” was developed,<sup>142</sup> as well as a “Draft Work Plan of the Joint Working Group on MASS”.<sup>143</sup>

45. On November 2-11, 2022, the Maritime Safety Committee, at its 106<sup>th</sup> session (MSC 106) considered the report on the first session of the MASS-JWG, including the abovementioned Table and Draft Work Plan.<sup>144</sup>

46. During a discussion on the scope of application of the GBS MASS Code, Argentina emphasized that if the GBS MASS Code covered all types of MASS, it would cause considerable challenges in view of the UNCLOS provisions, especially Article 94 on flag state obligations. In this context, LEG 109’s position regarding the need for MASS to comply with the UNCLOS provisions was reiterated. LEG 109 emphasized that any increased level of vessel autonomy should first be analyzed and consented to by the UNCLOS States Parties, and only afterward could the IMO deal with these enhanced autonomy degrees.<sup>145</sup>

47. Regarding the operative issues, the MASS Working Group would strictly follow the “Generic Guidelines for Developing IMO Goal-Based Standards”<sup>146</sup> (GBS General Guidelines) while working on the goals and functional requirements for the non-mandatory GBS MASS Code.<sup>147</sup>

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140 Ibid.

141 MSC-LEG-FAL Joint Working Group on MASS, MASS-JWG 1/WP.1: Report of MSC-LEG-FAL Joint Working Group on Maritime Autonomous Surface Ships (MASS) on Its First Session (2022), para. 14.

142 Ibid., para. 23.

143 Ibid., para. 24.

144 IMO Maritime Safety Committee, MSC 106/19: Report of the Maritime Safety Committee on Its 106th Session (2022), para. 5.2.

145 Ibid., para. 5.5.

146 IMO Maritime Safety Committee, MSC.1/Circ.1394/Rev.2: Generic Guidelines for Developing IMO Goal-Based Standards (2019).

147 The Goal-Based framework includes two stages, which are 1) development of the Goal-Based Standards (so-called “Rules for the Rules”) and 2) Detailed Requirements. The first phase (1) is composed of three subsequent developments

48. Furthermore, MSC 106 decided, in principle, that<sup>148</sup>:

- (1) The GBS MASS Code aims to complement rather than duplicate the existing IMO instruments; thus, it should not repeat already existing IMO regulations, especially those deriving from the Convention for the Safety of Life at Sea (SOLAS);
- (2) given the time constraints deriving from the close target entry in force date of the non-mandatory GBS MASS Code set for the year 2025, the work on the GBS MASS Code should focus on the development of goals and functional requirements rather than detailed requirements (Tier IV);
- (3) thus, the formulation of the regulations, rules or provisions (Tier IV) and consequently their incorporation into the GBS MASS Code may pertain to IMO instruments or be based on those drafted by national administrations or other organizations (for example, classification societies);
- (4) the verification phase (Tier III), as foreseen by the GBS General Guidelines,<sup>149</sup> should be considered at a later stage; and
- (5) it is essential to take into account the human element during the work on the GBS MASS Code, and thus the “Checklist for considering and addressing the human element”<sup>150</sup> should be consulted.

49. Moreover, MSC 106 acknowledged that applicable MASS terminology poses significant difficulties for the MASS Working Group when formulating functional requirements.<sup>151</sup> The definition and concrete characteristics of the term “MASS”, i.e., what unmanned vessel really means (fully autonomous or remotely operated and would it also cover vessels with a reduced crew on

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of: Goals (Tier I), Functional requirements (Tier II), and Verification of conformity (Tier III). Phase two (2) includes the development of the Rules and regulations for vessels (such as IMO and national requirements, rules of the classification societies, etc.). Finally, the industry practices and standards are established (Tier V). *Ibid.*, para. 10.

148 IMO Maritime Safety Committee, above n. 144, para. 5.23.

149 IMO Maritime Safety Committee, above n. 146, para. 16–19.

150 IMO Maritime Safety Committee & IMO Marine Environment Protection Committee, MSC-MEPC.1/Circ.5/Rev.3: Organization and Method of Work of the Maritime Safety Committee and the Marine Environment Protection Committee and Their Subsidiary Bodies, Annex 5 (2022).

151 IMO Maritime Safety Committee, above n. 144, para. 5.26.1.

board),<sup>152</sup> need clarification to allow consistent development of the regulations.<sup>153</sup>

50. Finally, the Committee noted the substantial workload required to further develop the GBS MASS Code. Therefore, based on the positive experience with the RSE, MSC 106 invited interested IMO Member States and organizations to actively participate in developing the goals and functional requirements for the draft of the GBS MASS Code.<sup>154</sup>

### *III.C.ii Committees' Progress: Year 2023*

51. On March 13-17, 2023, the Facilitation Committee held its 47<sup>th</sup> session (FAL 47). After thorough deliberation, FAL 47 installed the Working Group on FAL MASS and approved the "Roadmap" to target MASS-related issues deriving from the application of the Convention on Facilitation of International Maritime Traffic (FAL Convention).<sup>155</sup> The "Roadmap" responded, among other things, to the results of the FAL's RSE (approved by FAL 46) and the fact that the RSE did not cover the recent amendments to the FAL Convention.<sup>156</sup> Moreover, FAL 47 indicated that the MASS-JWG should devote special attention to the identified shared concerns, such as the responsibility issues of the master, remote operator, and crewmembers, applicable terminology, certification, and information sharing.<sup>157</sup>

52. On March 27-31, 2023, the Legal Committee held its 110<sup>th</sup> session (LEG 110). After discussion, the Committee approved the report from the first session of the MASS-JWG and agreed on the operative matters related to the Group's activities.<sup>158</sup> Among the important views expressed during LEG 110, the considerations on UNCLOS must be mentioned. The delegations participating in the session expressed two opposite opinions regarding the question of whether UNCLOS impedes MASS operations. Whereas most of them considered that UNCLOS did not represent a regulatory barrier for MASS, others disagreed with this view, also indicating that UNCLOS State

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152 More on the terminological complexities in: Barbara Stępień, above n. 6.

153 IMO Maritime Safety Committee, above n. 144, para. 5.26.2.

154 *Ibid.*, para. 5.27-28.

155 IMO Facilitation Committee, FAL 47/22: Report of the Facilitation Committee on Its Forty-Seventh Session (2023), para. 13.22.

156 *Ibid.*, para. 13.21.1-2.

157 *Ibid.*, para. 13.22.6.

158 MSC-LEG-FAL Joint Working Group on MASS, MASS-JWG 2/2/5: Outcome of LEG 110 and Urgent Matters Emanating Therefrom (2023), para. 3.1-8.

Parties are the ones who are competent to interpret UNCLOS's provisions regarding MASS and not IMO.<sup>159</sup> Furthermore, the Committee decided to analyze the MASS-related liability issues, the application of the instruments within LEG's purview, and possible UNCLOS-related implications at its next session (LEG 111).<sup>160</sup> Finally, LEG 110 decided that the MASS-JWG should analyze the role of a master in the context of MASS.<sup>161</sup>

53. On April 17-21, 2023, the MSC-LEG-FAL Joint Working Group held its 2<sup>nd</sup> session (MASS-JWG 2). During extensive deliberation, the Group analyzed various MASS-related topics and scenarios such as role, responsibilities, competencies, and requirements for the MASS master and crewmembers, the possibility of a MASS master being responsible for multiple MASS, and also an option of several masters being responsible for a MASS on a single voyage.<sup>162</sup> The role, responsibilities, and requirements for a Remote Operations Centre (ROC), the operation of a MASS by different ROCs, and an operation of multiple MASS by a person at a ROC were also discussed.<sup>163</sup> Furthermore, the Group examined a remote operator's role, responsibilities, competencies, and requirements.<sup>164</sup> The designation of a MASS master in a ROC, and requirements for a master to be on board when there are persons or crew on board were also assessed.<sup>165</sup>

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159 *Ibid.*, para. 7. For further information on the key element of UNCLOS related to dispute settlement regarding its interpretation see: Bing Bing Jia, *The Curious Case of Article 281: A "Super" Provision within UNCLOS?*, 46 *Ocean Development & International Law* (2015); Keyuan Zou & Qiang Ye, *Interpretation and Application of Article 298 of the Law of the Sea Convention in Recent Annex VII Arbitrations: An Appraisal*, 48 *Ocean Development & International Law* (2017); Bernard H. Oxman, *The Fortieth Anniversary of the United Nations Convention on the Law of the Sea*, 99 *International Law Studies* (2022), 871. For an overview of the UNCLOS dispute settlement system, see Sienho Yee, *En Route to the Final Shape of the UNCLOS Dispute Settlement System: Some Pivotal Negotiating Procedural Steps Worthy of Consideration by Future Treaty-Makers and Leaders in Treaty-Making*, 13 *Chinese JIL* (2014), 188.

160 MSC-LEG-FAL Joint Working Group on MASS, above n. 158, para. 9.1.

161 *Ibid.*, para. 9.2.

162 IMO Secretariat, MSC 107/5/1: Report of MSC-LEG-FAL Joint Working Group on Maritime Autonomous Surface Ships (MASS) on Its Second Session (2023), paras. 12–24.

163 *Ibid.*, para. 25–32.

164 *Ibid.*, para. 34–37.

165 *Ibid.*, para. 38–43.

54. Moreover, MASS-JWG 2 discussed the jurisdictional concerns related to the responsibility of the flag State with respect to the location of ROCs.<sup>166</sup> Additionally, a redefinition of the term “Maritime Autonomous Surface Ship (MASS)” was also proposed so as to broaden it to “Maritime Autonomous Ships and Systems (MASS)”. The Group, however, did not concur at this stage, noting that the applicable terminology and the autonomy levels should be further discussed once MSC commences to develop the GBS MASS Code.<sup>167</sup>

55. On May 31 to June 9, 2023, the Maritime Safety Committee held its 107<sup>th</sup> session (MSC 107), where plenty of specific questions were discussed (as happened during the session of MASS-JWG 2). MSC 107 noted, among other opinions, the need to establish appropriate provisions regarding the participation of MASS in search and rescue operations,<sup>168</sup> applicable risk assessment methodologies to be included in the GBS MASS Code,<sup>169</sup> terminology required for the development of the functional requirements,<sup>170</sup> and to review the STCW Convention and Code in the context of the division of the competencies in relation to MASS.<sup>171</sup> Furthermore, the Committee also analyzed the broad report of the MASS-JWG 2 and agreed, among other things, with its assessment that a human master in charge of MASS was necessary (regardless of the autonomy and/or manning level).<sup>172</sup> Although it was permissible that the human master not be present on board (if the technological solutions allow it, also considering other human presence on board), the employed technology should allow the MASS master to act when required.

56. Whereas MSC 107 agreed, in principle, that several masters could be responsible for a MASS on a single voyage in specific circumstances (to be further clarified by the engaged Committees), it also concluded that there should be only a one master responsible for a MASS at any given time.<sup>173</sup>

57. Regarding the Remote Operations Centres (ROC), the Committee agreed, in principle, with its definition as proposed by the MASS-JWG 2.<sup>174</sup>

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166 *Ibid.*, para. 44.

167 *Ibid.*, para. 54–59.

168 IMO Maritime Safety Committee, MSC 107/20: Report of the Maritime Safety Committee on Its 107th Session (2023), para. 5.12.

169 *Ibid.*, para. 5.13.

170 *Ibid.*, para. 5.14–15.

171 *Ibid.*, para. 5.17–19.

172 *Ibid.*, para. 5.22.2.1.

173 *Ibid.*, para. 5.22.2.5–6.

174 *Ibid.*, para. 5.22.9–10.

Moreover, it also concurred, in principle, that a scenario of one or more ROCs and/or one master being responsible for a MASS on a single voyage could be possible under certain conditions (to be further specified by the corresponding Committees).<sup>175</sup> Although MSC 107 also agreed that only a single ROC should be responsible for a MASS at one time, it also underscored that this is a topic reserved solely for the further considerations of MSC, and thus, MASS-JWG would not need to analyze it in the future.<sup>176</sup>

58. In terms of general considerations, the Committee concurred that the IMO advancements on MASS should be brought to the attention of the International Labour Organization.<sup>177</sup> MSC 107 also acknowledged that it was agreed by the MASS-JWG that the interpretation of UNCLOS remained with its States Parties but that, at the same time, this did not prevent IMO, as a competent organization responsible for shipping-related matters, from promoting practical and legal solutions related to MASS operations.<sup>178</sup> Finally, among other organizational issues, MSC 107 instructed the MASS Working Group to keep working on the non-mandatory GBS MASS Code and approved the revised “Road Map” (as presented in Annex 15 to the session’s report).

### *III.C.iii Committees’ Progress: Year 2024*

59. On April 8-12, 2024, the Facilitation Committee held its 48<sup>th</sup> session (FAL 48).<sup>179</sup> The Committee approved the report of the MASS-JWG 2 from its second meeting, concurring, in principle, with the presented findings.<sup>180</sup> Moreover, FAL 48 established the Working Group on Other Facilitation Subjects with the aim of revising the “Road Map” pertaining to MASS operations within the FAL Convention.<sup>181</sup> The revised “Road Map” was approved by FAL 48 and annexed to the session’s report (Annex 4).<sup>182</sup>

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175 *Ibid.*, para. 5.22.10,13.

176 *Ibid.*, para. 5.22.11.

177 *Ibid.*, para. 5.22.7.

178 *Ibid.*, para. 5.22.20.

179 IMO Facilitation Committee, FAL 48/20: Report of the Facilitation Committee on Its Forty-Eighth Session (2024), para. 1.1.

180 *Ibid.*, para. 8.7-8.8.

181 *Ibid.*, para. 8.11.

182 *Ibid.*, para. 8.12.

60. On April 22-26, 2024, the Legal Committee held its 111<sup>th</sup> session (LEG 111).<sup>183</sup> The Committee's extensive deliberation was focused on the three main topics: 1) the liability and compensation matters related to MASS, 2) guidance on the implementation of LEG instruments *vis-à-vis* MASS, and 3) MASS operations in the context of the UNCLOS provisions.<sup>184</sup> After in-depth discussions, LEG 111 approved the "Road Map" for its further work on MASS (as presented in Annex 8 to the session's report).

61. On May 08-10, 2024, the MSC-LEG-FAL Joint Working Group held its 3<sup>rd</sup> session (MASS-JWG 3) analyzing multiple MASS-related issues. Among other things, the Group discussed competencies, qualifications, and training for the MASS crew, the MASS master's responsibility and authority, and the relationship between the onboard crew and the shore-based master.<sup>185</sup> Furthermore, MASS-JWG 3 concluded that, at this stage, its work was completed.<sup>186</sup>

62. On May 15-24, 2024, the Maritime Safety Committee held its 108<sup>th</sup> session (MSC 108). During the meeting, the Committee discussed a vast array of MASS-related issues such as safety management certification, the role of the master, and MASS trials (specifically addressing the scenario in which the officer of the navigational watch –OOW– would act as the sole lookout during periods of darkness).<sup>187</sup> Moreover, MSC 108 revised the "Road Map" for developing the GBS MASS Code, as presented in Annex 16 to the session's report). The Committee also concluded that, given the experience-building phase and the lessons learned from the application of the non-mandatory GBS MASS Code, it would not be possible to meet the initially planned adoption deadline for the mandatory GBS MASS Code. Consequently, MSC 108 agreed that the earliest possible mandatory GBS MASS Code entry into force date would be January 1, 2032.<sup>188</sup>

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183 IMO Legal Committee, LEG 111/17: Report of the Legal Committee on the Work of Its 111th Session (2024), para. 1.1.

184 *Ibid.*, para. 10.7.

185 IMO Maritime Safety Committee, MSC 108/20: Report of the Maritime Safety Committee on Its 108th Session (2024), para 4.30.

186 *Ibid.*, para. 4.30.10.

187 *Ibid.*, para. 4.33-4.46.

188 *Ibid.*, para. 4.44.1-2.

63. Milestones achieved in regulating MASS during this period:

- (2022) The Maritime Safety Committee, during its 105<sup>th</sup> session, decided to develop a non-mandatory Goal-Based MASS Code.<sup>189</sup> This milestone represents a crucial step in the regulatory approach. It prioritizes flexibility and innovatory tools in accommodating MASS within the existing regulatory framework. MSC 105 initially decided to focus on cargo vessels with potential future extension to passenger ships based on accumulated experience.
- (2022) The Facilitation Committee, during its 46<sup>th</sup> session, approved the results of its Regulatory Scoping Exercise,<sup>190</sup> which marked a significant advancement in understanding and delineating the specific changes required to accommodate MASS within the facilitation framework. A targeted completion year for new measures was set for 2025.
- (2022) The installation of the MSC-LEG-FAL Joint Working Group represents a landmark in the collaborative regulatory efforts of the IMO Committees.<sup>191</sup> Moreover, it underscored the IMO's commitment to integrate insights from different Committees. The main objective of this Working Group was to address the common regulatory issues identified across the involved committees, ensuring a harmonized approach to MASS regulation.
- (2024) The Maritime Safety Committee, during its 108<sup>th</sup> session, rescheduled the earliest possible mandatory MASS GBS Code entry into force date for January 1, 2032.<sup>192</sup> The challenges in meeting the previously planned deadline underline the legal complexities related to MASS operations within the existing regulatory framework.

#### IV. Concluding Remarks: Future Challenges for IMO

64. This paper demonstrates that at this time, despite the technological development, there are no legal instruments at the international level (not even guidelines or recommendations), regulating autonomous and unmanned maritime vessels, which would enable their international navigation.<sup>193</sup> However, at the same time, the International Maritime Organization has

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189 IMO Maritime Safety Committee, above n. 129, para. 7.11.

190 IMO Facilitation Committee, above n. 137, para. 14.8.

191 MSC-LEG-FAL Joint Working Group on MASS, above n. 141.

192 IMO Maritime Safety Committee, above n. 185, paras. 4.44.1–2.

193 Except for the circular on the Interim Guidelines for MASS tests, MSC.1/Circ.1604, which only refers to tests.

been working to remedy this deficit. Moreover, to date, no binding definition or legal category has been developed for these vessels; the term “Maritime Autonomous Surface Ship (MASS)” is only a working term and was adopted for the purposes of the Maritime Safety Committee’s “Regulatory Scoping Exercise”. Consequently, the IMO Committees involved in the work on MASS encounter terminological difficulties that will need to be clarified to develop coherent functional requirements.<sup>194</sup>

65. Regarding the timeframe, it is uncertain when binding regulations will be established internationally, enabling MASS operation globally. The IMO’s work on the analyzed topic is behind the established schedule.<sup>195</sup> The main reasons for delays include the extensive scope of the RSE—particularly in the case of the MSC—and the COVID-19 pandemic, which *de facto* suspended the work of the IMO Committees involved on the topic for over a year.

66. Even though IMO intends to adopt a mandatory GBS MASS Code by 2032, there will still be no detailed requirements developed by private actors, such as classification societies and maritime administrations. Moreover, the above date is only indicative and will be updated on a running basis, considering the work development as it already occurred. It is also noteworthy that the abovementioned Code will apply only to cargo vessels (so far, no work is being done regarding autonomous and/or unmanned passenger vessels).

67. Moreover, the scope of IMO’s work, including the Committees and Working Groups involved, concerns only legal instruments (mainly international conventions) adopted under the auspices of IMO. Hence, the well-established foundation for the legal order prevailing at seas,<sup>196</sup> the 1982 United Nations Convention on the Law of the Sea, has not been analyzed in terms of the emergence of new types of maritime vessels (such as MASS). Consequently, the IMO Member States duly indicate that even if IMO successfully regulates MASS, the UNCLOS provisions will remain a major barrier to MASS participation in international shipping.

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194 IMO Maritime Safety Committee, above n. 144, para. 5.26.

195 The MSC and the FAL Committees originally planned to complete the “Regulatory Scoping Exercise” in 2020. However, in the case of the MSC Committee, this happened one year later, i.e., in 2021, while the FAL Committee completed the RSE with a two-year delay, i.e., in 2022.

196 Rob McLaughlin, *The Law of the Sea and PRC Gray-Zone Operations in the South China Sea*, 116 *American JIL* (2022), 829.

68. Furthermore, none of the interested organizations or institutions has begun a revision of the UNCLOS provisions, which would aim to verify the possibility of operating and/or accommodating MASS in the applicable regime of the law of the sea. It also remains a matter of dispute whether IMO is competent at all to undertake any work (including interpretation) necessary to regulate MASS under UNCLOS's provisions or whether this is a competence reserved only for the UNCLOS States Parties.<sup>197</sup> Notably, the international legal regime affecting international shipping is also impacted, apart from the UNCLOS and IMO instruments, by the regulations adopted by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the International Labour Organization (ILO) and the International Organization for Standardization (ISO), among others. Accordingly, these organizations must also examine the legal regulations within their remit to enable the MASS operation.

69. Finally, as also acknowledged by the IMO Committees, matters such as the responsibility of the remote operator and the producers of computer systems remain unregulated. They will undoubtedly constitute a significant *de iure* and *de facto* barrier, hindering the operation of autonomous and unmanned systems in international shipping.

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197 IMO Legal Committee, above n. 122, para. 13.8.

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Current Developments