Report of the CMI IWG Sub-Group on MASS and Collisions

A. Executive Summary

1. This document provides an overview of the discussions held by the CMI IWG Sub-Group on MASS and Collisions.

B. Background

2. This sub-group was established to discuss issues arising from Maritime Autonomous Surface Ships (MASS) and any impact these may have on the work of the International Working Group (IWG) examining the 1910 Collision Convention. The purpose was to ensure that both IWGs (MASS and Collision) were cognisant of the issues that may (or may not) arise with the introduction of MASS in relation to the 1910 Collision Convention and any potential revisions thereof.

3. The Sub-Group accordingly had members from both IWGs. Representing the IWG on MASS were Tom Birch Reynardson (as rapporteur) (Birch Reynardson & Co), Luci Carey (University of Aberdeen), Henrik Ringbom (Åbo Akademi) and Frank Stevens (Erasmus University). Representing the IWG on the Collision Convention were John O'Connor (Langlois Avocats), Leyla Pearson (ICS), and Dieter Schwampe (Arnecke Sibeth Dabelstein). It is noted that not all participants contributed to every item or attended both meetings.

C. Format

4. The sub-group held two meetings. The first was held on 27 January 2025 and the second on 7 March 2025. Participants were circulated 14 questions for discussion in advance. This report provides information regarding the content of the discussions and the issues that were identified.

D. Questions and Discussion

Q1. How is the term 'vessel' as referred to in Article 3 of the 1910 Convention ("fault of the vessel") to be interpreted in the context of MASS? Does it extend to faults by remote operators, or even by fully autonomous ships?

5. The 1910 Collision Convention uses the term 'vessel' but does not define it. The 1952 Collision Convention (Civil Jurisdiction) and the 1952 Collision Convention (Penal Jurisdiction) do not define the term 'vessel' either. The term 'vessel' thus needs to be interpreted by the national courts. In the recent case *Fimbank v KCH Shipping* [2024] UKSC 38; [2024] Bus LR 1845, the UK Supreme Court affirmed that international conventions should be

interpreted by reference to broad and general principles of interpretation rather than any narrower domestic law principles.[1]

6. National 'vessel' definitions tend to be very broad. Furthermore, there is a directly relevant convention that does have a definition of the term vessel, i.e. the Collision Regulations (COLREGS). Art. 3(a) of COLREGs defines a 'vessel' as every description of watercraft, including non-displacement craft and seaplanes, used or capable of being used as a means of transportation on water.'

7. The general view of the meeting was that a MASS of any nature, whether controlled by a remote operator or a fully autonomous MASS, was a "vessel" as referred to in Art 3 of the Convention.

Q2. Will an owner's vicarious liability for collisions extend to entities such as remote operators, software suppliers, or shipyards whose errors have caused/contributed to the collision?

8. Regarding the various categories discussed, i.e. operators, software suppliers or shipyards, the principles as such do not change; it is only the factual scenarios to which the principles have to be applied that may change.

9. The general view was that vicarious liability issues are not specifically related to either MASS or collisions. Rather they relate to the shipowner's liability more generally, for matters related to the operation of ships. The issues discussed concerned the extent of vicarious liability, and whether it extends to ROCs, or more remotely to software manufacturers.

10. This issue was covered by the CMI paper on liability submitted to the IMO Legal Committee in January 2024.[2]

Q3. Would a multi-ship collision involving one or more MASS pose any particular issues under the 1910 Convention?

11. If a MASS is considered a 'vessel' within the meaning of the 1910 Convention, then no. The question was raised whether there should be a higher level of liability for those who want to gain from using MASS rather than ships with crews. The counter argument is that MASS is (very) expensive and that ship owners might switch to MASS, not because they think to make a profit, but because they are forced to do so, e.g. because of the shortage of seafarers. Concern was expressed that there might be a

[1] Per Lord Hamblen at [34] citing with approval, *Alize 1954 v Allianz Elementar Versicherungs AG (The CMA CGM Libra*) [2021] UKSC 51.

[2] LEG 111/10/2 MEASURES TO ADDRESS MARITIME AUTONOMOUS SURFACE SHIPS (MASS) IN INSTRUMENTS UNDER THE PURVIEW OF THE LEGAL COMMITTEE Summary of the research of the Comité Maritime International (CMI) International Working Group (IWG) on MASS in relation to liability issues Submitted by Comité Maritime International.

strict liability regime for those who used modern technology in order to reduce risk.

12. The issue of fairness was raised. It was suggested that it would be unfair for a MASS ship to be liable in a collision with a non-MASS ship where the non-MASS ship was at fault. Although strict liability is attractive in some circumstances, if the accident was going to happen anyway why should it be different for MASS? A discussion also took place as to whether strict liability could be justified, particularly in circumstances where shipowners might be vicariously liable, for example for the fault of ROC's.

Q4. Would article 5 of the 1910 Convention (on pilots) extend to e-pilotage undertaken from shore or to mandatory instructions from coastal authorities?

13. The 1910 Convention does not (explicitly) require the pilot to be on board. Shore Based Pilotage (Remote Pilotage) already exists today for traditional manned vessels.

14. The view was expressed that Art. 5 would apply when the pilot provides advice from a distance rather than on board of the ship and the questions asked, why would that be different with e-pilotage?

15. The general opinion was that as long as pilotage is provided as a service to an individual ship, this idea of treating the pilot as a crew member for purposes of liability is not problematic. But if e-pilotage is becoming more 'industrialized' by the coastal state, e.g. by coordinated piloting of all ships in an area, hence becoming more like a VTS (or like Air Traffic Control in the air industry), issues may change (and coastal states should assume more responsibility). But we are not there yet.

Q5. To what extent does the 1910 Convention extend to allisions involving a MASS and a stationary object?

16. The applicability of the 1910 Convention will depend on the definition of the stationary object. Stationary objects that are not ships, like bridges, are not covered by the 1910 Convention although some domestic laws treat allisions in the same way as collisions. The question was asked would it be necessary to extend the 1910 Convention to allision?

Q6. What applies if it is considered that the fault of the MASS was not a "fault of the vessel" under the 1910 Convention?

17. The participants noted that it will depend on the factual scenario.

18. If the MASS collides due to failure of the communication link to the ROC, or to some software bug, which is deemed beyond the fault of the ship and if the 1910 Convention does not apply, then other national tort rules may be applied.

19. If the ship sinks and there is no evidence available, could the software manufacturer be pursued? The same rules apply whether it is MASS or not MASS. The general view was that it is not clear whether there is any need to treat MASS differently.

20. However, some of the 1910 Convention articles will potentially be relevant. For example, if there is no failure of the MASS at all, then the other ship should pay (art 3), and if the other ship is not at fault either, then liability should be equally divided (art 4(1)) or, if the cause is unknown, liability should lie where it falls (art 2(1)).

Q7. How does MASS affect the characterisation of fault in the context of collisions?

21. This question prompted the most discussion. It was pointed out that the concept of fault will not change with the introduction of MASS. It was more a question of looking at the outcomes. Does the outcome produced by the MASS (speed, course steered, turns executed, etc.) fall within the scope of what the maritime industry and society in general is entitled to expect from a MASS? Fault presumes the availability of alternatives.
22. It was suggested that if you operate a MASS you are taking a risk. If you take a risk, then should you assume a greater burden of liability? A party is, in principle, responsible for the technology it uses (even if that party doesn't really 'understand' or 'control' the technology). The CMR Convention (road carriage) for example explicitly provides that the carrier shall not be relieved of liability by reason of the defective condition of the vehicle used by him (Art. 17.3).

23. Where there is a collision involving AI, then it was suggested there ought to be rules to govern the discovery of documents. Participants agreed there is a need for explainable AI[3] in casualty investigations to determine proportionate fault.

24. If however, a government is responsible for the maintenance of some mandatory infrastructure, and was negligent causing a casualty, there may be a defence. This defence exists in all pollution liability conventions (see e.g.1992 CLC, art 3(2)(c); 2001 Bunkers Convention art 3(3)(c).

25. Fault implies that there is an alternative course of action which could and should have been taken. If there is no alternative action, then is there any fault? Is there a risk that MASS increases the possibility that no fault can be established and that no-one will therefore be liable for any damage? In such cases does this also pose a risk to society.

[3] "Explainable Artificial Intelligence (XAI) is the ability of AI systems to provide clear and understandable explanations for their actions and decisions." European Data Protection Supervisor 'TechDispatch on Explainable Artificial Intelligence' available at https://www.edps.europa.eu/system/files/2023-11/23-11-16_techdispatch_xai_en.pdf.

26. The question was posed whether, if there had been a crew on board, remedial action could have been taken to avoid the loss which occurred because this was a MASS? This approach does not sit easily with the 1910 Convention because there may be an assumption of liability on a party without any consideration of fault.

27. It was suggested that perhaps it comes down to the cause of the breakdown. If for example the satellite communication is severely delayed or breaks down, why should this be the responsibility or "fault" of the shipowner? The view was expressed that such cases may well represent a large part of MASS collisions.

28. It was submitted that if the collision occurs because there is no crew on board there should be "augmented" liability for the shipowner. The counter argument is that if one created a liability regime of this nature you would be punishing owners who had invested in modern technology.

29. The question was asked, why will owners opt for MASS? Is it because it is:

    a. Safer
    b. Better operations
    c. Cheaper
    d. No need to deal with crew?

30. It was thought it was likely there were a combination of reasons. And it was pointed out that it is becoming increasingly difficult to recruit crew. However, it was also considered that the *reason* behind opting for MASS is not relevant for deciding whether an owner is liable or not.

Q8. Would an unidentified programming error in a MASS' computer system lead to equal sharing of liability under Article 4 of the 1910 Convention?

31. Article 4 envisages a circumstance where the degree of respective fault cannot be established, in which case liability is shared 50/50. The general view was that there is no reason why this rule should not apply to MASS as well.

32. Q9. Could the 1910 Convention accommodate features such as "cumulative" or "anonymous" culpa, whereby there is no need to identify a negligent individual in order to establish fault of the owner?

33. The view was that the answer is yes, because the 1910 Convention does not refer to the fault of a person (Master, crew, pilot, ...). The Convention refers to "fault of the vessel", and it is simply an interpretation to say that this must refer to a fault or negligence of a human being.

34. If it is accepted that 'things' (products) can indeed be 'at fault' (the more common terminology is to say that the product is defective), the 1910 Collision Convention is MASS-proof.

Q10. Are there limits on how high the required standard of care may be raised by parties to the 1910 Convention?

35. The 1910 Convention provides that the ship owner is liable for "fault of the vessel" resulting in a collision. The standard of care is essentially the question: to what lengths does the ship owner have to go to prevent collisions? For traditional manned ships the standard is not perfection: it is possible that certain manoeuvres, which do in fact result in a collision, are not considered a 'fault'.

36. The general opinion was that the standard for MASS should not be (much) higher than the standard for traditional ships. The standard of care would presumably be determined by tort law – what would a 'reasonable MASS' do? This may come from the guidance from IMO MASS Code.

37. Concerns were raised that there was a risk of raising the standard so high for MASS as to make it strict liability. It is not possible, it was thought, to have different standards of care in the Collision Convention.

38. It was pointed out that IMO had determined that there would always be a Master, and if the Master is overseeing the navigation and the behaviour of the MASS, then the standard of care should be the same.

39. However, if a MASS master is operating the ship from an ROC this was the same as a master being on board, but that way of operating ships may introduce a series of new risks that are not necessarily clear from a liability point of view.

40. It was pointed out that MASS should not be understood as a new category of ships, but rather as a new way to operate ships with the aid of technology. Many of the questions discussed above could arise at a very modest level of technology, which is already available on most ships. If, for example, a ship was authorised to operate on autopilot, without lookout or an officer on watch, for part of the voyage as long as no radar targets are closer than 5 nautical miles, and a collision happened during this type of operation, many of the questions relating to collision liability would arise and have to be settled. There is therefore no reason to consider that clarity on collision liability will be of practical relevance only once there has been some kind of technological breakthrough.

41. However, it was also pointed out that whether and to what extent MASS poses additional risks and the potential impact on liability of such risks may only be known once MASS vessels were operated more widely and cross jurisdictionally.

Q11. To what extent does the 1910 Convention (Article 6) rule out (different kinds of) presumptions of fault or liability placed on MASS?

42. The 1910 Convention rules out all legal presumptions. *Legal* presumptions refer to rules that *oblige* a court to deduce a certain conclusion from certain

facts (if A and B are married, and A gives birth to a child, the court *must* deduce that B is the father). Presumptions of fact (e.g. res ipsa loquitur) can still be used by the courts. Presumptions *of fact* refer to situations where a court finds a certain fact proven based on other facts (if a car runs into a tree in the early hours of the morning, on a straight lane, without any other cars nearby, a court *may* deduce from these facts another fact, to whit that the driver fell asleep).

43. Domestic legislation providing that in a collision involving a MASS, the MASS is presumed to be at fault would violate the 1910 Convention. A court finding in a particular case that the MASS system must have been 'at fault', because the MASS did something very strange and unexpected is not a violation of art 6 of the 1910 Convention.

Q12. Would a no-fault liability coupled with contributory negligence exception be compatible with the 1910 Convention?

44. No, because the 1910 Convention is explicitly fault-based. The possibility of a contributory negligence defence is not a (sufficient) counter-argument — contributory negligence also exists with regard to traditional manned vessels.

45. Another view was that contributory negligence could nevertheless address the fairness concern, if a MASS that had 'augmented' liability thresholds collided with a traditional ship and the fault was mainly with the latter ship.

46. Should strict liability for MASS be considered it may be helpful to pray in aid that contributory negligence will soften the blow.

Q13. Is there a possibility to apply other liability schemes, such as product liability for equipment manufacturers, in parallel to the 1910 Convention?

47. There is no provision in the 1910 Convention suggesting that this Convention creates an exhaustive regime, that claims arising from a collision can only be filed pursuant to the 1910 Convention. See, in contrast, e.g. Art. III.4 CLC:. … no claim for compensation for pollution damage under this Convention or otherwise may be made against (owners, crew members, charterers, pilots, persons taking preventive measures etc or their servants or agents).

48. There is nothing to stop claimants from suing the ship owner on an alternative legal basis, or from suing other parties. This possibility already exists today, with regard to (collisions between) traditional manned vessels, but seems hardly used in practice (possibly because such alternative claims are hard).

49. So long as you can establish the requirements for a tort-based claim then you cannot be prevented from making the claim.

50. The LLMC may protect shipowners and certain other parties from multiple claims but does not extend to manufacturers so they would not be protected by limitation. The issue of channelling was discussed. If the 1910 Convention is amended, it would be useful, indeed most likely necessary to address the MASS issue.

51. If there are no other reasons to amend the 1910 Convention than MASS, the existing Convention can accommodate MASS with some re-interpretation / progressing interpretation. However, if changes are made to the Convention, it is thought that these should be by way of a Protocol which States are invited to adopt, rather than a new Convention which would require States to denounce the existing Convention.

Actions

52. Report and discussions to be presented at the CMI Conference in Tokyo.