

LEGAL COMMITTEE  
105th session  
Agenda item 11

LEG 105/11/1  
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## WORK PROGRAMME

### Proposal for a regulatory scoping exercise and gap analysis with respect to Maritime Autonomous Surface Ships (MASS)

Submitted by Canada, Finland, Georgia, the Marshall Islands, Norway,  
the Republic of Korea, Turkey, CMI, ICS and P&I Clubs

#### SUMMARY

*Executive summary:* This document invites the Legal Committee to undertake a regulatory scoping exercise of the conventions under its purview to establish the extent to which the international regulatory framework should be modified to integrate the new and advancing technology of Maritime Autonomous Surface Ships (MASS)

*Strategic direction:* 1, 2 and 6

*High-level action:*

*Output:* No related provisions

*Action to be taken:* Paragraph 24

*Related document:* MSC 98/20/2

#### Introduction

1 This document proposes that the Committee undertakes a regulatory scoping exercise of existing instruments under its purview to better understand the implications arising from the introduction of MASS.

2 MASS includes various levels of automation ranging from partially automated systems that assist a human crew to fully autonomous systems that require no human intervention. MASS are not yet in commercial operation, but there are several projects underway globally to make autonomous ship operations a reality:

- .1 in Norway, the **Yara Birkeland** is anticipated to be the first autonomous commercial ship, scheduled to launch in 2018 with a staggered approach to fully autonomous and remote operation by 2020;

- .2 in the Baltic Sea, the "One Sea – Autonomous Maritime Ecosystem" project is aiming to enable fully remote controlled vessels in the Baltic Sea by 2020 and to achieve autonomous commercial operation by 2025. A test area for this project has been established off the west coast of Finland;
- .3 a Japanese shipping firm will begin testing remote controlled vessels in the Pacific in 2019, with an objective of achieving fully autonomous vessels by 2025; and
- .4 Rolls-Royce is working towards the initial stages of a remotely operated vessel beginning in 2020 with unmanned, ocean-going commercial ships anticipated by 2035.

3 MASS are expected to fundamentally transform the maritime industry by providing efficiencies, cost savings, and safety and security benefits that are not attainable with crewed ships. For example, MASS are expected to:

- .1 more easily run on cleaner fuel;
- .2 be more streamlined and have more room for cargo, as there would be smaller or no crew quarters;
- .3 reduce the threat of piracy as they operate with less or no crew and can be designed to make boarding from sea difficult; and
- .4 reduce certain types of accidents as human error is a significant factor in marine accident rates<sup>1</sup>.

4 Despite these benefits, MASS, in particular those with no crew on board, will also fundamentally disrupt the current international regulatory frameworks, including those covering safety, security, environmental protection, and liability, compensation and insurance. Though the regulatory frameworks governing the maritime industry have adapted well over time to accommodate new technologies, they were never drafted to consider ships with no crew on board.

5 Two brief examples of where the Committee needs to examine its conventions in light of MASS include:

- .1 The requirement for the master and the operator of the ship to report a wreck under the *Nairobi International Convention on the Removal of Wrecks, 2007*. It may be necessary to review the use of the terms "master" and "operator" of the ship to determine whether they apply to MASS. It may also be necessary to review the requirement that they report without delay on the nature of the damage to the ship because if there is no crew on board, it may be difficult to ascertain the nature of the damage.
- .2 Various liability conventions include compulsory insurance with State certification requirements which require that the certificates attesting that insurance or other financial security is in place are carried on board the ship. However, if there is no crew on board and possibly no bridge, this requirement may not be relevant or may pose a challenge in both flag State and port State control.

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<sup>1</sup> According to Allianz Global Corporate's publication *Safety and Shipping: 1912-2012 From Titanic to Costa Concordia*, 75% to 96% of marine accidents can be attributed to human error.

6 It is the co-sponsors' intention that this proposal will help the Committee, and more broadly IMO, understand the full range of regulatory implications arising from MASS and plan accordingly for these important technological advancements.

### **IMO's objectives**

7 The proposal is within the scope of the Organization's objectives to "uphold its leadership role as the global regulator of shipping" and "enable the advancement of shipping, whilst addressing the challenges of continued developments in technology and world trade". It is indisputable that the use of MASS will continue to advance and that it will have significant impacts on the maritime industry that will require leadership at the international level and a consistent regulatory approach.

8 The proposal would contribute to the implementation of IMO's Strategic Directions (SDs) 1, 2 and 6:

- .1 SD 1, to improve implementation, aims to facilitate the implementation of IMO instruments by Member States;
- .2 SD 2, to integrate new and advancing technologies in the regulatory framework, aims to ensure that the Organization's regulatory framework is continuously adapted to address new and advancing technologies in the shipping industry to ensure safety, security and environmental protection; and
- .3 SD 6, to ensure regulatory effectiveness, aims to, among other things, ensure the continued effectiveness of the regulatory framework by reviewing existing regulations and developing new ones to address new technologies.

9 IMO's involvement in this issue has precedent as evidenced by the Maritime Safety Committee's (MSC) decision at its ninety-eighth session to approve the undertaking of a regulatory scoping exercise of the instruments that fall under its purview to ensure the safe design, construction and operation of MASS. MSC agreed to include the scoping exercise in its 2018-2019 biennial agenda and the agenda for MSC 99. MSC also recognized that the scoping exercise would affect the whole Organization and that similar exercises may need to be taken by other IMO committees.

### **Need**

10 The rise of MASS technology is inevitable and advancing rapidly. It is important for the Committee to:

- .1 proactively consider the implementation of MASS technology;
- .2 ensure that the legal framework set out in instruments under the purview of the Committee provides the same levels of protection provided for operations with non-autonomous ships; and
- .3 ensure that the conventions emanating from the Committee are clear in their application to MASS.

11 As the United Nations organization responsible for the promotion of safe, efficient and environmentally friendly international shipping practices, IMO has an important role to play in leading the development of an international framework that accommodates new technologies, such as MASS. Aligning the Committee's work with the work of MSC's regulatory scoping exercise will contribute to a common and comprehensive understanding of the measures which would be necessary for the international maritime community to successfully adapt to the emergence of MASS.

### **Analysis of the issue**

12 The impacts of MASS at the international level on matters under the purview of the Committee has not yet been considered in a comprehensive manner. A scoping exercise of existing regulations would be a practical first step to better understand the impacts of MASS. It would provide the necessary information for the Committee to develop an action plan to address MASS in the work it oversees, if deemed necessary, and in tandem with work being undertaken by MSC.

### **Analysis of the implications**

13 The current proposal is limited to a regulatory scoping exercise. There would be no costs to the maritime industry nor any administrative requirements arising from this output. The *Checklist for identifying administrative requirements* as contained in annex 3 of the document on the *Organization and method of work of the Legal Committee* (LEG.1/Circ.8) has been completed and is attached.

14 The intent of the regulatory scoping exercise would be to identify issues with the conventions under the purview of the Committee. Following the regulatory scoping exercise, the Committee would have to consider how best to address any issues identified. The regulatory scoping exercise would provide the foundation to determine the implications of any subsequent action. The Committee may also need to consider issues related to MASS arising from the work of other committees.

15 The consequences of not undertaking the proposed regulatory scoping exercise could contribute to the proliferation of MASS in an unregulated manner which could lead to adverse impacts related to matters under the purview of the Committee and would undermine the credibility of IMO as the regulator of international shipping.

### **Benefits**

16 As MASS technology matures and is used more broadly throughout the maritime industry, this scoping exercise would be an important step in ensuring the IMO regulatory framework, in particular the instruments that fall under the purview of the Committee, is prepared for the commercial and international use of MASS. It would complement the work being undertaken at MSC from a safety and security perspective and contribute to an organization-wide approach to MASS.

### **Industry standard**

17 There are no applicable industry standards regarding MASS that are relevant to the matters dealt with by the Committee. This reinforces the need to begin work at the international level.

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## Output

18 The co-sponsors propose that the Committee establishes a new output to undertake a regulatory scoping exercise of IMO conventions under its purview to:

- .1 identify provisions of those conventions that preclude unmanned operations;
- .2 identify provisions of those conventions that do not apply to unmanned operations;
- .3 identify provisions of those conventions that do not preclude unmanned operations but that would need to be amended to acknowledge differences in the operation of unmanned operations; and
- .4 identify other gaps in the existing regulatory framework that would need to be addressed.

19 The intent is that a regulatory scoping exercise will help IMO understand the full range of regulatory implications arising from MASS and plan appropriately to accommodate this new and advancing technology into an effective international regulatory framework.

20 The output is:

- .1 *Specific:* The regulatory scoping exercise would allow the Committee to identify specific issues with the regulatory framework relating to MASS.
- .2 *Measurable:* The output is measurable to the extent that an inventory will be created of which regulatory instruments under the purview of the Committee will need updating, starting with the conventions.
- .3 *Achievable:* A review of existing Committee instruments to assess the impact of MASS has a clear end-point and is a self-contained exercise.
- .4 *Realistic:* The proposed scoping exercise is consistent with Strategic Directions 1, 2 and 6 of the Organization. MSC is already undertaking a similar scoping exercise. The Committee Members' subject matter expertise will be leveraged.
- .5 *Time-Bound:* The co-sponsors propose that this work be accomplished within the next four sessions of the Legal Committee.

## Urgency

21 Given the number of conventions and instruments overseen by the Committee, it is estimated that a maximum of four sessions will be necessary to complete the work. This is aligned with the timelines approved for the regulatory scoping exercise undertaken by MSC, ensuring that the Organization is working efficiently and effectively across its major committees.

22 The co-sponsors propose that the regulatory scoping exercise is added to the agenda of the Legal Committee for the 2018-2019 biennium, and in due course for the 2020-2021 biennium.

23 If the proposed regulatory scoping exercise is not approved at the 105th session of the Committee, IMO may not be prepared to manage the full introduction of MASS internationally, which is likely to be realized within the next ten years.

**Action requested of the Committee**

24 The Legal Committee is invited to:

- .1 take note of the information contained in this document;
- .2 provide views on the proposed output to undertake a regulatory scoping exercise with respect to MASS; and
- .3 agree that the proposed output be added to the Legal Committee agenda as suggested in paragraph 22 for the 2018-2019 biennium, and in due course for the 2020-2021 biennium.

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**ANNEX 1**

**CHECKLIST FOR IDENTIFYING ADMINISTRATIVE REQUIREMENTS**

This checklist should be used when preparing the analysis of implications required in submissions of proposals for inclusion of outputs. For the purpose of this analysis, the term "administrative requirement" is defined, in accordance with resolution A.1043(27), as an obligation, arising from a mandatory IMO instrument, to provide or retain information or data.

Instructions:

- (A) If the answer to any of the questions below is YES, the Member State proposing an output should provide supporting details on whether the requirements are likely to involve start-up and/or ongoing costs. The Member State should also give a brief description of the requirement and, if possible, provide recommendations for further work, e.g. would it be possible to combine the activity with an existing requirement.
- (B) If the proposal for the output does not contain such an activity, answer NR (Not required).
- (C) For any administrative requirement, full consideration should be given to electronic means of fulfilling the requirement in order to alleviate administrative burdens.

<p>1. Notification and reporting? Reporting certain events before or after the event has taken place, e.g. notification of voyage, statistical reporting for IMO Members, etc.</p>	<p>NR ✓</p>	<p>Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing</p>
<p>Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)</p>		
<p>2. Record-keeping? Keeping statutory documents up to date, e.g. records of accidents, records of cargo, records of inspections, records of education, etc.</p>	<p>NR ✓</p>	<p>Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing</p>
<p>Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)</p>		
<p>3. Publication and documentation? Producing documents for third parties, e.g. warning signs, registration displays, publication of results of testing, etc.</p>	<p>NR ✓</p>	<p>Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing</p>
<p>Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)</p>		
<p>4. Permits or applications? Applying for and maintaining permission to operate, e.g. certificates, classification society costs, etc.</p>	<p>NR ✓</p>	<p>Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing</p>
<p>Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)</p>		
<p>5. Other identified requirements?</p>	<p>NR ✓</p>	<p>Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing</p>
<p>Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)</p>		