**Report of the 2nd meeting of the**

**IALA MASS Task Force**

**8 December 2021**

# Welcome and introductions

The Chair and Vice Chair welcomed all participants to the meeting. Jillian Carson-Jackson and Anne Miettinen had submitted their apologies for absence.

# Approval of the agenda

The agenda was approved by the Task Force.

# Presentation on work underway in each technical committee with respect to MASS

## ARM

Roger Barker and Jakob Bang provided an update on the work of the ARM Committee.

During the last session in the ARM Committee in October 2021, an initial MASS meeting was held which was attended by 7-8 participants and chaired by Guttorm Tomren from Norway. Discussions took place on the challenges and way forward for the ARM Committee in relation to MASS. Currently it is expected that the work will end up with a recommendation or guideline covering ARM work items related to MASS. Intersessional work is underway on the way forward, before the next committee meeting in March 2022.

In general, IALA’s main purpose is to provide recommendations and guidance to the coastal states and the maritime administrations on their products, services and obligations. The development of MASS will bring changes to shipping, port operations and the safety of navigation, and it is important to assess and discuss its impact on IALA related services at an early stage of its development.

Having said MASS, it is very important to bear in mind that MASS are not by definition the same as unmanned ships. It is ships where a number of functions are fully or partially automated in order to improve safety, reliability, and efficiency of operations, and we must take that fact into consideration in our work with IALA publications.

If we are on the strategic level e.g. looking at the SOLAS V, Reg. 13 obligations, with AtoN provision based on volume of traffic and degree of risk. How will the development of MASS, digital technologies and systems effect on that. Will the volume of traffic change? That is difficult to predict and many other elements can have influence on that. But when it comes to the degree of risk, ARM believe that new digital technologies will affect the degree of risk, and the maritime administrations must be ready to consider their products and services.

The development of appropriate IALA Standards, Guidelines and Recommendations are essential in that respect, as well as the work with common terminology and standards for communication, ship reporting and data exchange, between MASS and e.g. VTS centers and other stakeholders.

If we are looking at the Aids to Navigation requirements and management, the focus areas for the ARM Committee in regards to MASS are considered to be:

* The Maritime Buoyage System MBS. The MBS must apply to AtoN provision for all vessels (SOLAS and non SOLAS including MASS). So that will be an ongoing task in the committee to follow the development of MASS in order to ensure, that the MBS is covering the AtoN provisions for these developments.
* All reviews of ARM managed documents will include consideration on MASS and inclusion of appropriate statements where applicable with the understanding that MASS is starting to become part of the maritime traffic mix along with traditional vessels.
* ARM will develop a policy statement on AtoN requirement and management with regard to MASS, e.g. with the above volume of traffic and degree of risk issue as an example.
* Specific guidance for AtoN authorities on MASS will be developed where gaps in existing recommendations and guidelines are identified. Where feasible these will be cross committee to avoid proliferation of MASS specific documents.
* These focus areas, as well as probably other MASS related activities, are expected to be included in the ARM task plan for 2023 to 2027.

The above approaches are reflected in the input paper MTF02-3.1.1 ARM14-11.1.2 Liaison note to PAP and MASS Task force - ARM approach to MASS.

## ENAV

In the absence of Jillian Carson-Jackson, Hideki Noguchi provided an update on the work of the ENAV Committee.

The ENAV Committee is maintaining a Guideline related to reports on testbeds for ENAV. Some other committees have expressed an interest in participating and sharing information wider than ENAV related topics, such as MASS. A standard reporting format is planned for development.

The Committee received feedback from VTS on digital communication technologies.

WG1 of ENAV received input from China suggesting a new Maritime Service for MASS may be required. This may need to be proposed to the IMO at a future stage.

WG3 of ENAV has been working on VDES and that satellite frequencies have been allocated,, ITU Recommendations are in the process of being revised and it is foreseen that this work could be finalized in early 2022.

## ENG

Simon Millyard provided a briefing on the work of ENG in several domain areas:

|  |  |  |
| --- | --- | --- |
| **Technical domain** | **Topic** | **Current status and relevance to MASS** |
| **rPNT** | Enhanced Radar Positioning System | In initial development with trials undertaken; Initial workshop planned for November 2021 to identify standards requirements.  This will provide satellite independent & resilient position information within radar range of the AtoN.  Draft guideline nearing completion. |
| Terrestrial positioning systems: | R-Mode development (MF & VHF) Guideline produced, trials undertaken. This is in development.  This will provide rPNT over existing AtoN infrastructure (AIS & DGNSS stations). |
| Product Specifications for eLoran | Continued support for eLoran. Terrestrial alternative to GNSS |
| GNSS Augmentation systems | SBAS accreditation for Maritime receivers - Guideline being produced. |
| GBAS (DGNSS system) – maintenance of system standards. |
| **Timing** | Timing and synchronisation | Timing and synchronisation are important to the combined use of different navigation systems. MASS are likely to need to report their position accurately but also timely, and therefore time availability and synchronisation is expected to be important. |
| **Power** | Solar Panel specifications | Guidelines exist and are being developed.  It may be that floating AtoN can provide more energy to power additional equipment to support MASS. |
| Power storage & generation for floating AtoN | Guidelines exist & will be updated.  It may be that floating AtoN can provide more energy to power additional equipment to support MASS. |
| **Radar Visibility** | Radar Reflectors – revised guideline | May allow floating AtoN to be designed to be identified by MASS radar systems. |
| **Visual Signals** | Machine Vision, Infrared | No work at present, however, used in aviation. |

## VTS

Neil Trainor briefed members that, as scheduled in the 2018 - 2022 Work Programme, the VTS Committee commenced work *Task 1.2.5 - Develop guidance on the Implications of Maritime Autonomous Surface Ships (MASS) from a VTS Perspective* at VTS50 in March 2021.

Key outcomes to date highlighted include:

1. **Case Studies** – The use of case studies was identified as a useful tool in developing the Discussion Paper to assist the Committee achieve a common understanding of MASS and its implications on the provision of VTS.
2. Particularly, ‘case studies’ provide a mechanism to gain insight into ‘trials’ and test beds’ being conducted, outcomes, lessons learnt, emerging information, implications for VTS, etc.

Preparation of the ‘Case Studies’ document also highlighted:

* The document should be circulated to the other IALA Committees and the IALA Task Force for their information.
* There may be benefits for IALA considering:
  + Adapting the ‘Case Studies’ template to also flag studies which may also have implications/interest for ENAV and ARM.
  + Expanding *IALA Guideline 1107 – Planning and reporting of e‐Navigation Testbeds* to include MASS and in a manner that compliments the IMO Interim Guidelines for MASS Trials.
  + Encouraging Committee participants to engage with MASS trials being initiated in their waters with a view to involvement in the projects as appropriate.

A copy of the liaison note to the MTF and the draft document are at:

* ***MTF02-3.4.1*** *VTS51-13.1.1.5 Liaison Note to MASS Task Force - Operations and Trials of Autonomous Ships - ‘Case Studies’*
* ***MTF02-3.4.2*** *VTS51-13.1.1.5.1 WP TG1.2.5 Possible case studies - Operations and Trials of Autonomous Ships*

1. **Discussion Paper** – A draft discussion paper on the implications of MASS from a VTS perspective has been prepared as part of Task 1.2.5 to assist the VTS Committee:

* Achieve a common understanding of MASS and its implications on the provision of VTS by clearly and concisely identifying:
  + Trends and opportunities presented by MASS.
  + Issues / challenges for the management of ship traffic in a VTS area.
  + Options, policies, and strategies for VTS to embrace / influence MASS.
  + Implications for the regulatory and legal framework for VTS.
  + Implications for IALA Standards relating to VTS.
* Monitor the advent of MASS and its associated implications for VTS.
* Strategically plan for MASS and determine new work programme tasks associated with the preparation of new/amended IALA guidance.
* Develop guidance to assist authorities ensure the safety and efficiency of vessel movements in the VTS area.

The advent of MASS will be ongoing for many years and it is intended that the discussion paper will be reviewed and updated, as appropriate:

* Following VTS Committee meetings.
* To reflect outcomes from the recently completed regulatory scoping exercise on Maritime Autonomous Surface Ships (MASS) by the IMO to assess existing IMO instruments to see how they might apply to ships with varying degrees of automation (MSC.1-Circ.1638).
* To reflect amendments to IALA’s Strategic Vision and Current Drivers and Trends.
* To reflect outcomes from the MASS Task Force.

It is not the intention for the Discussion Paper to address the issues/implications identified.  This will be achieved new/amended work programme tasks adopted by the Committee.

In preparing the draft discussion paper it was also identified that with the rapid developments associated with MASS and associated supporting technologies there would be benefits in circulating the paper to the other IALA Committees and the MASS Task Force for their information and comment.

A copy of the liaison note to the MTF and the draft document are at:

* ***MTF02-3.4.3*** *VTS51-13.1.1.6 Liaison Note to MASS Task Force - Implications of MASS from a VTS Perspective – a discussion paper*
* ***MTF02-3.4.4*** *VTS51-13.1.1.6.1 WP TG.1.2.5 Discussion paper - Implications of MASS from a VTS perspective post plenary*

1. **Preparation of Guidance** – The VTS Committee is of the view that preparation of guidance material should continue to be paused, noting:

* The Regulatory Scoping Exercise completed by the IMO in May 2021 identified far ranging implications to international conventions which need to be worked through. For example:
  + *“ …. a number of high-priority issues, cutting across several instruments, that would need to be addressed at a policy level to determine future work.*
  + *These involve the development of MASS terminology and definitions, including an internationally agreed definition of MASS and clarifying the meaning of the term “master”, “crew” or “responsible person”, particularly in Degrees Three (remotely controlled ship) and Four (fully autonomous ship).”*
  + *“Other key issues include addressing the functional and operational requirements of the remote-control station/centre and the possible designation of a remote operator as seafarer”.*
  + *“….. the best way forward to address MASS in the IMO regulatory framework could, preferably, be in a holistic manner through the development of a goal-based MASS instrument.”*
* The development of the Discussion paper.
* The consideration of ‘Case Studies’.
* Existing guidance available for MASS trials such as:
  + The IMO Interim Guidelines for MASS Trials (MSC.1/Circ.1604).
  + EU Operational Guidelines for Safe, Secure and Sustainable Trials of Maritime Autonomous Surface Ships (MASS).
  + MASS UK Industry Conduct Principles and Code of Practice.

Participants also noted that MSC met again following VTS51 (*MSC 104 (4-8 October 2021))* where the Committee took the following decisions:

* *requested the Chair to prepare, together with the Secretariat and in consultation with the submitters of the proposals and commenting documents (see paragraph 15.6) and the former Chair of the MASS Working Group, a road map, including scope, steps and timelines, as well as the coordination of work with other IMO bodies, taking into account the documents submitted and comments made at this session and the outcome of the RSE (MSC.1/Circ.1638), for detailed consideration at MSC 105, to be submitted well in time for the next session to enable comments;*
* *included in the biennial agenda of the Committee for 2022-2023 and the provisional agenda for MSC 105 a new output on "Development of a goal-based instrument for maritime autonomous surface ships (MASS)", with a target completion year of 2025, taking into account that the title of this output may be adjusted based on the review of the road map at MSC 105;*
* *agreed that the first step in this new output would be the finalization of a road map to have a common understanding of the following steps; and, time allowing, the Committee could also embark on the development of instruments already at MSC 105;*
* *agreed that the ultimate goal would be the preparation of a mandatory instrument to address MASS operations; and*
* *agreed to re-establish the Working Group on MASS at MSC 105 to commence the work on the new output, including finalization of the aforementioned road map.*

MSC105 is scheduled to be held 20-29 April 2022.

# Discussion and identification of any gaps/parallel activities of work

The IMO MSC is a major focal point for MASS and are considering a potential mandatory instrument for MASS. Parallels were drawn with standards being developed for the automotive industries. IALA should be an active contributor to this work in the MSC through an input paper considering their interaction capability of MASS with AtoN and external infrastructure.

This could be in the format of a basic IALA position/guiding principles on MASS. This should be framed also in the context of maintaining services for conventional vessels and their interaction with MASS as well as considering topics such as requirements for back-up PNT systems independent of GNSS.

It would not be feasible to make an input to MSC105 due to the tight timeframe for submission and lack of time for discussion in the committees. The preparation of any submission would be a cross-committee task.

The pace of development in the IMO is likely to be slow. A first step may be a consolidated information paper explaining the work being undertaken by IALA in the technical committees which can then be taken into account when the MSC is determining the way ahead. This may then be supplemented by further information or input papers on topics being considered within the MSC.

It was considered best to prepare an input paper for MSC106. This would allow the preparation of a more substantive paper to send a clear message of the positive progress of work underway within IALA.

Tracking of the work of the technical committees with respect to MASS was considered important. Whilst several options were considered it was suggested that brief updates could be provided at each meeting of the Task Force to enable progress and areas of parallel activity to be identified and discussed.

The draft Recommendation and Guideline on MASS under development within ENAV were discussed as being suitable for cross-committee collaboration. It was suggested that a framework of topics should be submitted to PAP with a view to each technical committee then contributing to the development of the Guideline. The Guideline document could be a joint Guideline from all committees with each committee contributing text and sections within their respective areas of expertise. This would then produce one document with IALA’s approach to MASS in its entirety. This document can then be used to support any submissions to outside bodies such as the IMO.

MASS is a fast-moving technology and it has to be acknowledged that such a document will be regularly updated to maintain its relevance and integrity.

# date of next meeting

It was agreed that the Task Force would meet after the spring technical committees.

* 1. List of participants

Maarten Berrevoets – Chair

Capt M Segar – Vice Chair

Roger Barker – ARM Committee representative

Simon Millyard – ENG Committee representative

Neil Trainor – VTS Committee representative

Jakob Bang – MASS Ports Network

Hideki NOGUCHI – MASS Ports Network

Martikainen Tuomas – MASS Ports Network

Eunice Pui – Guest (MPA Singapore)

Omar Eriksson – IALA Deputy Secretary-General

Minsu Jeon – IALA Technical Operations Manager

Kevin Gregory – Secretary