



IALA ENAV COMMITTEE

REPORT OF THE 28TH SESSION OF THE IALA E-NAVIGATION INFORMATION SERVICES AND COMMUNICATIONS (ENAV) COMMITTEE

11 to 29th October 2021

Jaime Alvarez
Committee Secretary

29 October 2021

10, rue des Gaudines – 78100 Saint Germain en Laye, France
Tél. +33 (0)1 34 51 70 01 – Fax +33 (0)1 34 51 82 05 – contact@iala-aism.org

www.iala-aism.org

International Association of Marine Aids to Navigation and Lighthouse Authorities
Association Internationale de Signalisation Maritime

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Report of the 28th Session of the IALA e-Navigation Information Services and Communications (ENAV) Committee Executive Summary

The 28th meeting of the ENAV Committee was held virtually from 11 to 29 October 2021; chaired by Hideki Noguchi and vice-chaired by Jorge Arroyo. The Secretary for the meeting was Jaime Alvarez.

There were 122 registered participants, 6 for the first time, from 32 countries and 4 organisations and 1 observer.

This was the 6th meeting for the 2018-2022 Work Programme and the Committee considered 38 input papers and produced 6 output papers.

Key highlights:

- New task proposal were identified for the next work programme 2023-2027
- The Committee reviewed the Maritime Buoyage System following ARM Committee request and proposed some amendments to the document through a liaison note
- A new revision of the Guideline 1128 on Specification of eNavigation technical service was finalised
- A new emerging technology for passive and active GNSS antenna systems decreasing the spoofing and jamming vulnerabilities of the GNSS signal was identified and presented during the session
- Related to the deployment of AtoN and eNavigation services in the context of MASS, the liaison note to PAP on proposal of amendment of maritime service for MASS was produced and a number of technical sessions conducted
- The liaison note to ARM regarding Ship Reporting Guideline was drafted
- The starting document of Draft Technical service specification for the provisioning of AtoN information to end-users using the S-125 data model launched the activity during the session
- The draft IALA Maritime Communications Manual was initiated

Planned intersessional work:

- Development of Draft Technical service specification for the provisioning of AtoN information to end users by means of the S-125 data model and contact Thomas Christensen (thomas@dmc.international) by 29/11/2021, following dates were selected to run the meetings and the links will be published in the calendar Dashboard:
 - December 9 @13:00 - 15:00 UTC
 - February 3 @ 13:00 - 15:00 UTC
- Development of the Maritime Communications Manual and contact Ernie Batty (ernie.b@imisglobal.com) by 12 November 2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard.
- Start the revision of G1107 and contact Jillian Carson-Jackson (jillian@jcjconsulting.net) by 12 November 2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard
- Start the intersessional group working on the development of the draft Guideline on Artificial Intelligence and Machine Learning (ENAV28-12.2.4) within the domain of IALA and contact Ernie Batty (ernie.b@imisglobal.com) by 12 November 2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee

- Progress on the WG3 virtual intersessional VDES clarification meeting scheduled on 19th November and 13th December at 11.00-14.00 UTC.
- Continue the work on the joint IEC TC80 WG15 and IALA ENAV WG3 Intersessional meeting in the Netherlands, Harlem, from 10th of January 2022 at 08:00 UTC to the 14th of January 2022, 11:00 UTC.

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Report of the 28th Session of the IALA e-Navigation Information Services and Communications (ENAV) Committee

GENERAL

The 28th meeting of the ENAV Committee was held virtually from 11 to 29 October 2021; chaired by Hideki Noguchi and vice-chaired by Jorge Arroyo. The Secretary for the meeting was Jaime Alvarez. There were 122 registered participants, 6 for the first time, from 32 countries and 4 organisations and 1 observer.

An analysis of the attendance at ENAV28 is shown in Figure 1.

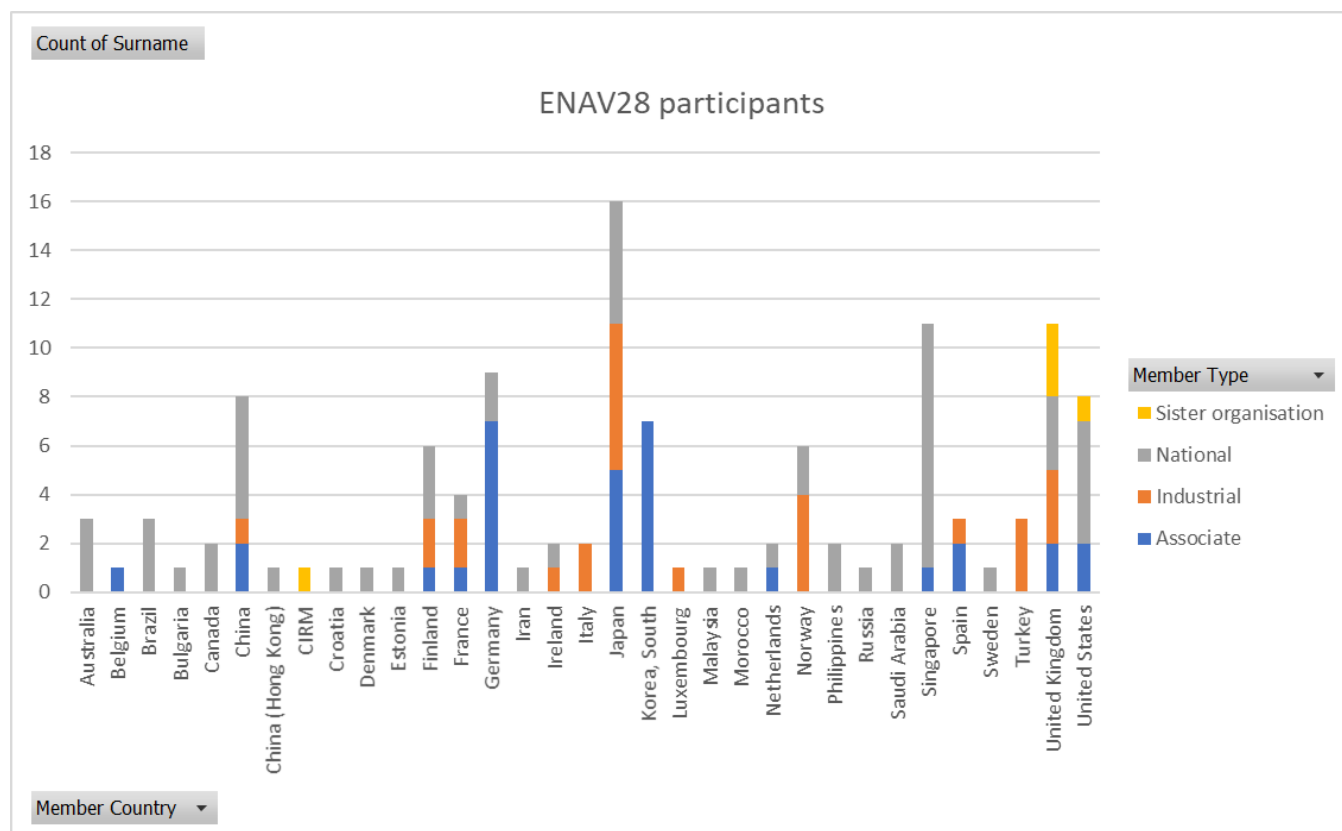
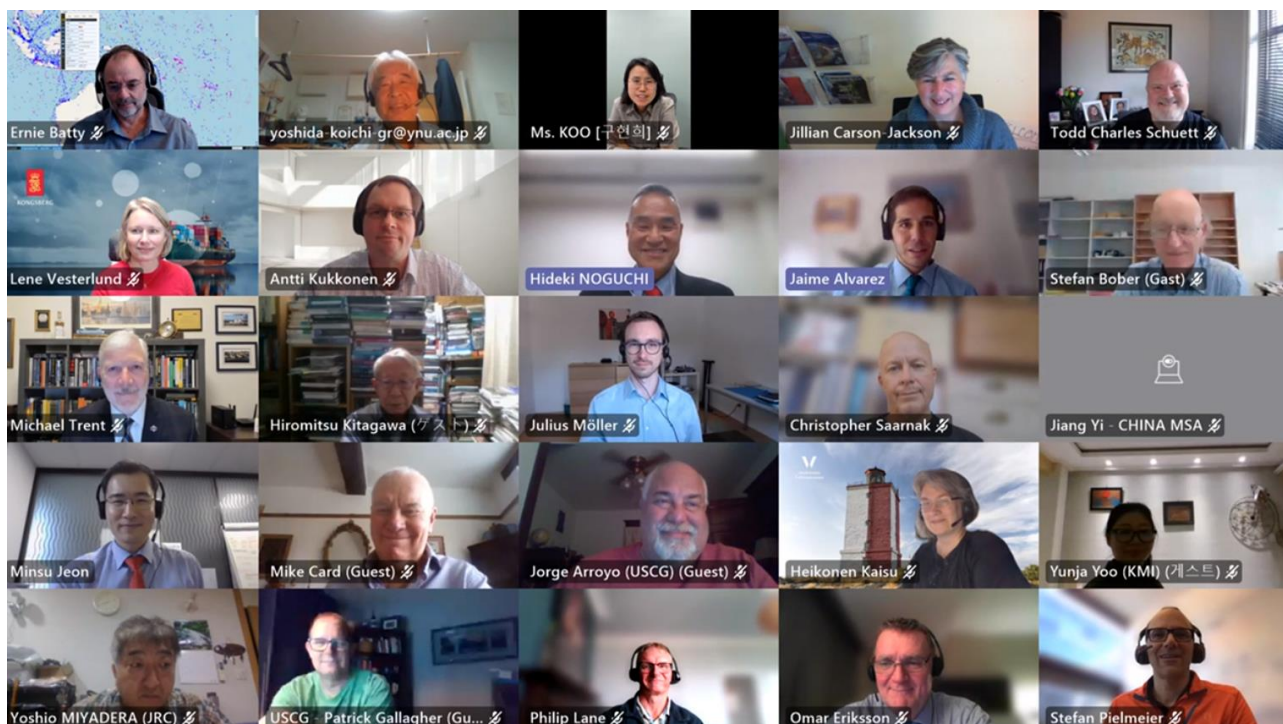


Figure 1 - Number of Participants per Country



There were a number of updates carried out in the Dashboard area in response to comments, concerns and requests from the previous session's virtual committee questionnaire and to fulfil the expectations of the Committee participants. As done in the previous session, the following platforms were used:

- MS Teams (to conduct meetings)
- Outlook Groups (to communicate with the Committee participants, sharing and seeking for document approval)
- Nextcloud Platform (to support the collaborative work of the committees, sharing documents, uploading, and downloading and make them available to all the Committees at any time)

A major upgrade is done on the [search engine](#) which indexes the content of a repository of the current IALA standards, recommendations, guidelines, model courses and manuals, including the IALA Navguide, the VTS manual and the Complementary Use of Lighthouses manual. The result after inserting a specific word in the search engine is a relation of all the documents where the selected word appears.

1. INTRODUCTION

1.1 Welcome from the Secretary-General

The Secretary-General, Francis Zachariae, welcomed all participants and was extremely glad to see them all, albeit on a computer screen. The Secretary-General expressed the wish to come back to normal again and thanked the Chair and Vice Chair of the Committee for their hard work in preparing for this meeting and for facilitating the friendly and hardworking atmosphere for which the Committee is known. The Secretary-General noted that on 1 July along with the international maritime community IALA and the members celebrated World Marine Aids to Navigation Day, the third in the series following the good work initiated in Palma de Mallorca, Spain, in 2019 and repeated virtually around the globe last year and this. The principal objective of this day was to promote greater awareness of IALA and its work by bringing to the attention of the wider public the role of marine aids to navigation and the significance of IALA's technical work in enhancing safety of navigation and protection of the environment. An excellent celebration of the Lighthouse of the Year, Cape Byron Lighthouse (Australia) also took place demonstrating the success of this concept. The Secretary-General expressed his gratitude to all the members for the arrangements of such events.

The topic of Maritime Autonomous Surface Ships or MASS was stressed, recalling the workshop of late May hosted by Japan which attracted more than one hundred participants from twenty-nine countries. The topic

was presented to the Spanish-speaking members of IALA at the end of June hosted by Chile. The final report could be found as part of inputs for ENAV28. The Council decided to establish a MASS task force under the PAP to investigate IALA's involvement in MASS developments. The group held one meeting so far where all the committees are represented, the results are expected with interest. The Secretary-General highlighted the number of MASS related documents on ENAV agenda for this meeting together with all the other important issues to be discussed: VDES, maritime services and many other technical information technologies.

The Secretary-General informed about the a growing number of States having signed the Convention on the International Organization for Marine Aids to Navigation. It was noted that more than halfway through the year of the Convention counts with three ratifications/acceptances and fifteen signatures received from diplomatic representatives in Paris. Brazil expected to sign during the week bringing IALA up to sixteen. This progress surely embodies the respect that the new organisation will have based on the many years of IALA's growth, maturity and excellence.

The Secretary-General informed about the upcoming workshops at the end of the year:

- Workshop on Cyber security in Marine AtoN operations in 15 to 19 November; and
- Workshop on Enhanced Radar Positioning System (ERPS) in 30 November to 2 December 2021.

The Secretary-General paid tribute to the efforts of IALA members during these difficult times with Covid-19. They have continued to provide aids to navigation so essential for the safety of marine traffic and the continuous facilitation of the global economy. The staff of IALA members have been (and still are) required to attend their normal workplace when responding to outages and maintenance required to keep their services operational. This devotion deserves special mention.

Lastly, the Secretary-General sadly informed of the death on 14 August of Mme Christiane Ville, former head of administration at IALA. Mme Christiane Ville was instrumental in the success of IALA over the many years she was part of the organisation, from its origins in 1957 to her retirement in 1991. Even after retirement she kept in touch and will be long remembered for her sound advice.

The Secretary-General wished all the participants good luck and thanked them once again for their contribution to global safety of navigation over this busy period.

1.2 Approval of the agenda

The agenda (ENAV28-1.2.1) was reviewed and adopted.

1.3 Introductions and apologies

The Chair welcomed all participants, especially the new participants of the committee.

See ANNEX B for the list of attendees and new participants.

No apology was received.

1.4 Working arrangements

The following statements were read to Committee members:

IALA is required to comply with the General Data Protection Regulations of the European Union. In the report of this meeting, IALA will include a list of participants with their contact information. Any participant who wishes to remove their personal information from the participants' list should advise the Committee Secretary as soon as possible.

If anyone present has knowledge of any patents, including pending Patents, held either by themselves or by other organisations or individuals, the use of which may be required to practice or implement the content of IALA Documents being developed or worked on in this Committee to inform the IALA Secretariat.

The Secretary briefly presented the Dashboard developed by IALA staff and will continue to be the One-Stop-Shop for conducting the Committees and centralised all the information, status and meeting needs for the member during the Committee working period. A new view of the calendar has been set up, providing a more understanding description of the meetings and discussions on going across the four Committees and within

the ENAV Committee. A major upgrade is done on the [search engine](#) which indexes the content of a repository of the current IALA standards, recommendations, guidelines, model courses and manuals, including the IALA Navguide, the VTS manual and the Complementary Use of Lighthouses manual. The result after inserting a specific word in the search engine is a relation of all the documents where the selected word appears.

1.5 Style Guide

The Secretary recalled the released [IALA Style Guide](#) designed to assist those members in preparing and reviewing IALA documentation. The purpose of this guide is to provide a common language, structure, and appearance.

This document is divided into three main parts:

- Style - Content (section 2) - this includes the preferred standards for grammar, language, punctuation, and spelling.
- Structure – Structure and formatting (section 3) - this includes how documents should be structured and ordered and includes the use of customised styles and fields in Microsoft Word.
- Appendices – including a supplementary table of spelling, a summary of the styles applied within the document templates and an extract from the IALA Brand Guidelines to illustrate the corporate colours.

2. REVIEW OF ACTION ITEMS FROM ENAV27 (ENAV28-2.1.1)

2.1 Action Items – IALA Secretariat

The Secretary informed that action items allocated to the Secretariat had been completed.

2.2 Action Items – ENAV Committee Participants

The Chair reviewed the progress of the action items allocated to committee participants and noted that some input papers had been received associated with them, which will be considered in the respective Working Groups. Among other action items, the Chair requested to share those candidates technologies as IoT through the Guideline 1153, support the MarCom manual and to support the progress on R-Mode across different sister organisations (IMO, ITU).

3. REPORTS FROM OTHER BODIES

3.1 IALA

3.1.1 IALA Council

Minsu Jeon, IALA Technical Manager, provided the committee with the report of Council 73 (ENAV28-3.1.1), which was held in June 2021. The following points are relevant to note for the ENAV Committee:

The Council approve to extend the Committee work program 2018 - 2023

The Council approved three recommendations and nine guidelines:

New and revised recommendations:

- R0143 Provision of Virtual Aids to Navigation, Ed2.0, June 2021
- R1022 Provision of GNSS Augmentation Service for maritime applications, Ed1.0, June 2021
- R0110 Rhythmic characters on Aids to Navigation Ed5.0, June 2021

New and revised guidelines:

- G1081 Provision of Virtual Aids to Navigation, Ed.2.0, June 2021
- G1143 Unique Identifiers for Maritime Resources, Ed3.0, June 2021

- G1159 Ship Reporting from a shore-based perspective, Ed1.0, June 2021
- G1134 Surface colours used as visual signals on AtoN, Ed2.0, June 2021
- G1160 Competencies for planning and implementing a VTS, Ed1.0, June 2021
- G1141 Operational procedures for delivering VTS, Ed2.0, June 2021
- G1132 VTS Voice Communications and Phraseology, Ed 2.0, June 2021
- G1017 Assessment of prior learning exemption for VTS model courses, Ed2.0, June 2021
- G1161 Evaluation of Platforms for the Provision of Maritime Services in the Context of e-Navigation Ed1.0, June 2021

Documents for further committee consideration

The Council advised further committee discussion on the following documents:

- G1110 Use of decision support tools for VTS personnel

Cape Byron (Australia) was elected as lighthouse of the year and the proposal from ENG Committee to organise the Workshop on Enhanced Radar Positioning Service was also approved and to be held from 30 November to 2 December 2021.

3.1.2 IALA Policy Advisory Panel

Minsu Jeon provided the committee with the outcomes of PAP 41, which was held virtually on September 2021. The following was highlighted to the participants:

- Draft proposal on Portrayal issues (PAP42-6.1.2.2): it was agreed to coordinate the work between IALA Committees (ARM, ENAV and VTS)
- Maritime Services: PAP discussed the work plan of each Committee. The Committees will send an information meeting (coordinated by ARM) to IMO NCSR on 2022

3.1.3 IALA World-Wide Academy

Kevin Gregory, IALA WWA Education and Development Manager, briefed about the activities and next steps of the WWA through the [video](#) recorded for more information.

3.1.4 MASS group update

Captain Segar introduced the developments made in the IALA task force on MASS aiming at coordinating efforts and avoiding IALA miss the opportunity to contribute actively in such matter. The task force met on August 2021 to agree on the Terms of Reference (ToR) of such group. One of the main purposes of the group is the adequate monitoring of activities related to MASS in IALA in order to increase the synergies between different technical committees, avoid overlapping of tasks and propose workflows on specific scenarios to further develop. Next meeting is scheduled for November 2021. Jillian Carson-Jackson is the ENAV representative in the MASS task force.

3.2 Digital@Sea

Minsu Jeon recalled the late paper on Digital@Sea initiative: The Highlight of Digital at Sea AP 2021 (ENAV28-5.2.13) reporting the outputs of Digital@Sea Asia Pacific 2021. The webinar of the initiative is available in the YouTube channel. Next meetings as follows:

- Digital@Sea International in 2023
- Digital@Sea Asia-Pacific in Q3 2022
- Digital@Sea North-America in Tampa Florida 25-26 January 2022

3.3 IMO

Hideki Noguchi, ENAV Chair provided a summary of milestones reached during the recent IMO meetings. Three meetings were held after ENAV27 in IMO and relevant for ENAV Committee: NCSR8, MSC103 and MSC104.

During the MSC103, it was recalled the finalisation of modernisation of GMDSS and the subsequent amendments of SOLAS Chapters III, IV and V. Those amendments were sent to MSC104 for adoption. As well noted, the MASS Regulatory Scoping Exercise finalised at MSC103. Japan, Singapore and Norway submitted an input to IMO to include VDES into SOLAS Chapter V. IMO agreed to start the work for the inclusion of VDES in Chapter IV and V.

During the IMO MSC104, the Japanese Regional Navigation Satellite System QZSS was recognised as a world-wide radionavigation system. It was decided to restart MASS matters with development ground based MASS instruments targeting 2025.

3.4 IHO

Minsu Jeon reported that the 5th IALA-IHO technical coordination meeting was held in April 2021. The session covered updates on S-100, and S-200, and S-124 and S-125. It was considered how to harmonise the terms and definitions of Marine AtoN and portrayal of IALA related product specifications. The joint workshop was postponed to next year in Norway on a face to face meeting. It is expected that IALA will join IHO HSSC to present the work of IALA and create a new domain for IALA in the portrayal registry, thus make official proposal on the portrayal of the IHO GI registry.

3.5 ITU

3.5.1 ITU-R WP5B

Stefan Bober provided participants with an update on ITU-R WP5B matters; refer to the input paper to get further details - Maritime mobile service including Global Maritime Distress and Safety System (GMDSS) (ENAV28-3.5.2); aeronautical mobile service and radiodetermination service - held its meeting from 10th to 21st May 2021.

The following documents and topics of interest for IALA were reviewed:

- WP5B- continued working on the revision of Recommendation ITU-R M.2092-0. The group reviewed the input considering the intersessional work progressed (the structure and two open points reviewed) and further amended the document editorially. However ITU WP5B plenary did not adopt the document due to the need of editorial alignments with perceived ITU document standards, that WP5B maritime was not aware of. It is expected that the preliminary draft revision of Recommendation ITU-R M.2092-0 will be adopted by WP5B and approved by Study Group 5 at the next meeting in November 2021 as there were no technical questions raised anymore. For the IALA scope of work, it should be considered that IALA may update G1139 according to the development at ITU WP5B and is invited to further contribute to the work on the revision of Recommendation ITU-R M. 2092-0 as appropriate.
- Revision of Recommendation ITU-R M.1371-5 (Automatic Identification System - AIS). The group reviewed the liaison statements from IALA and CIRM answering specific questions from ITU. The liaison notes from IALA and CIRM highlight the complexity of the issue and the impact on the safety of navigation. WP 5B suggested that IALA and CIRM liaise closely with IMO to progress the work on the revision of Recommendation ITU-R M.1371-5. IALA is invited to consider the liaison statement and provide input on the issues to the next IMO/ITU joint expert group meeting November 1st to 5th 2021.
- The following document was jointly submitted by IALA and CIRM for consideration at the 17th IMO/ITU joint expert group meeting to be held 1st to 5th November 2021:
 - IMO/ITU EG 17/7/2 - *Revision of Recommendation ITU-R M.1371-5 – Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile frequency band*. This document raised ITU-R Working Party 5B's

need for guidance from IMO on the way forwards regarding the revision of Recommendation ITU-R M.1371-5. Contributions to the discussion from CIRM and IALA were set out as annexes to the paper.

- WRC-23 agenda item 1.11 (Modernisation of the GMDSS and implementation of e-navigation).
- Revision of Recommendation ITU-R M.2135 (Autonomous Maritime Radio Device - AMRD)
- Revision of Recommendation ITU-R M.585-8 (Maritime identities)
- Revision of Recommendation ITU-R M.493-15 and ITU-R M.541 (Digital Selective-Calling DSC)
- Draft new report on the electromagnetic interference (EMI) from LED and other sources

The following documents were received from ITU to be considered and addressed during ENAV27:

- ITU-R WP5B Liaison statement to IALA, CIRM on revision of Rec. ITU-R M.1371-5
- Preliminary draft revision of Recommendation ITU-R M.2092-0
- Preliminary draft revision of Recommendation ITU-R M.1371-5

3.6 IEC

Jorge Arroyo, ENAV Vice-Chair, briefed about the progress on IEC reporting on the work on third edition of the Navigation presentation standard (IEC 62288) which was just completed, and the voting to be closed in November 19th 2021 for voting. It is expected to be published at the end of the year 2021.

IEC WG15, chaired by Stefan Bober and supported among others by Jorge Arroyo are completing the Man Over-Board (MOB) device standard to unify RTCM and ETSI standards, such standard will be soon for voting.

In parallel, the group is progressing on VDES and the joint IALA/IEC meeting on VDES standardisation.

Indian Regional Satellite Service is also a point of the agenda in IEC providing the standard which is currently a preliminary draft.

3.7 RTCM

Jorge Arroyo continued with the update on RTCM that had the annual assembly on late September. He also reported that three of RTCM's special committees are currently active:

- SC121 Guideline for ASM (Application specific messages) expected to be published by the end of the year. Work on developing standard AMRD Group B, to be submitted to IEC.
- SC137 on Electromagnetic Interference between LED lights with VHF and AIS to work with IEC
- Special Committee for the development of R-Mode through VDES

Annual Assembly in Washington May 2022 and Digital@Sea in Tampa next year are the next physical meetings arranged.

3.8 ETSI

Derek Love provided an overview of the progress of ETSI TG Marine concerning the update of standards and activities: DSC remote control test standard, virtual AtoN management, digitalization of voice in marine, inland radar liaison with IALA among other topics. Next meeting is scheduled on 8 of November.

3.9 3GPP

Minsu Jeon updated the latest news on 3GPP that release 17 and 18, 17 expected to finalise next year and 18 to continue, considering the following matters:

Release 17

- 5G URLLC

- Sidelink for unmanned car
- NTN-non terrestrial network for maritime, air and vessels

Release 18

- Enhancements to Proximity Services
- Vehicle Mounted Relay (VMR)
- Enhancements to 5G over satellite
- Multi-connectivities

The 3GPP representative H. Koo will be participating actively in ENAV28.

4. PRESENTATIONS

Below presentations were provided during the Opening Plenary and the links are available in the [dashboard](#):

4.1 [Opportunities for AIS 2.0 \(VDES\) / Lars Moltsen](#)

Lars Moltsen (Sternula ApS, Denmark) presented the opportunities with AIS 2.0 explaining the reason to speak about AIS 2.0 which has only a commercial purpose to make more comprehensive for the user. Lars stressed the following matters:

- The add-on of VDES services that could be provided: meteorological services, preventive maintenance for engines (collecting data from them) etc.
- Presentation of the role of Sternula in the ecosystem of VDES (satellite component)
- Roadmap of the infrastructure development (satellites launching)
- Targeting services according to the Maritime Service Portfolio and the eNavigation strategy implementation plan
- Description of the Meteorological Information Service (MARIOT project)
- The success factors related to the maritime digitalisation: collaboration between organisations and stakeholders and standardization.

4.2 [VDES Alliance / Arunima S Martinsen](#)

Arunima Martinsen presented the initiative (which runs in parallel with the Sternula company) called VDES Alliance which will be inaugurated in November. The Alliance aims at reaching the interoperability between all shipping stakeholders across the globe providing marketing resources in a common platform where the interoperability will be also tested and supported in harmonisation matters for new VDES applications.

Two kind of membership are considered in the Alliance:

- Contributing members: actively participating in the VDES developments as equipment manufacturers and large-scale integrators among others. Subcategorised into services developers and hardware manufacturers like VDES modem manufacturers.
- Non-industrial: IGO, Coast Guards and safety and security Agencies.

The call for expression of interest is open by sending an email to info@vdesalliance.org

4.3 [MASS development in VTS Committee / Neil Trainor](#)

Neil Trainor briefed about the work done in the VTS Committee, highlighting the outcomes to date: discussion paper, case studies and the draft guidance. By presenting the background of the discussions, the VTS Task 1.2.5 addressed the MASS implication into the VTS perspective. As an outcome of the group, the discussion paper on Implications of MASS from VTS perspective aims at achieving a common understanding of MASS and its implication on the provision of VTS services. The paper is intended to be a living document to consider

the following VTS meetings, to reflect outcomes from IMO (MSC.1-Circ.1638), to reflect amendments to IALA's Strategic Vision, Current Drivers and Trends, and the outcomes from the MASS Task Force. It is not the intention to address the issues/implications identified. This will be achieved through the work programme tasks. Case studies includes projects that may have commenced or test bed situation, brief information is provided and where there is VTS involvement. Rapporteurs provide information on such case studies.

The most long term document expected is the Guidance where a number of open points considered in Regulatory Scoping Exercise will be addressed. The Guidance will be feed with the discussion paper, the case studies and other guidelines on MASS selected.

The wayforward of the task will leverage the common understanding on the implications of MASS, monitoring the key developments and promote the engagement of IALA at IMO, agencies and stakeholders conducting MASS testbeds and trials.

4.4 [IEC standardisation for SBAS L1 maritime receivers](#) / Rodrigo Gonzalez

Rodrigo Gonzalez presented the status of standardization activities progressing in IEC that the technical committees are monitoring and contributing to as part of their program:

Publication of new IEC 61108-7 standard for SBAS L1 receiver equipment for harbour entrances/approaches and coastal waters.

Two initiatives are contributing to such standardisation:

- WG8 on SBAS receiver performances for maritime applications lead and created by European Standardisation Committee CEN with the purpose to present the technical reports from MARESS in IEC TC80 (purely a liaison mechanism) and finally present the final draft of IEC-61108 Part 7 for SBAS to IEC Technical Committee 80 where the standard is expected to be approved by state members. The target deadline for this milestone is mid-2023.
- MARESS Project: The MARESS project is developing a new standard in the IEC 61108 series that will focus on SBAS L1 receivers for maritime applications. Named: *"DRAFT INTERNATIONAL STANDARD IEC 61108-7, Maritime navigation and radiocommunication equipment and systems – Global navigation satellite systems (GNSS) – Part 7: Satellite Bases Augmentation System (SBAS) L1 – Receiver equipment – Performance standards, methods of testing and required test results"*.

The achieved milestones were:

- CEN/CLC JT5 WG8 meeting on 21st September. For this meeting, it was presented the current status of the MARESS project and discuss the comments and open points of the draft proposed.
- Kick-Off meeting for IEC TC80 61108-7 CD prior the plenary for IEC TC 80 which is planned from 12th to 14th of October 2021.

It was requested to join and participate in CEN European working group 8 at the end of 2021 planned next meeting and in the IEC Group TC80 PT61108-7 to develop and approve the standard (12 to 14 October) through the country representative.

Rodrigo recalled the role that SBAS could play in VDES as part of the Scenario GNSS augmentation corrections via VDES to get timing, integrity and improved position accuracy.

4.5 [Proposal of initiating discussion on the VDES resource sharing](#) / Koichi Yoshida

Koichi Yoshida referred to the input to ENAV28 5.1.3.3. He presented the background of relevant milestones for VDES and VDES Satellite. The necessity to progress on VDES communication services for the establishment of international cooperation, resource sharing and management on VDES terrestrial and satellite communication. It was proposed that IALA considers to promote the cooperation, sharing and management for VDES communications, need to establish an international organ on such cooperation, the systematic review of IALA Guidelines for VDES (G1117, G1139). Dr. Yoshida presented an scheme to make possible such collaboration including the planning, the investigation, the establishment of coordination platform and cooperation between nations.

4.6 Presentations during the working period

The Committee noted that further presentations are being arranged during the coming weeks addressing matters as Resilient PNT, Technologies and eNavigation platforms for MASS, Digital VHF, VDES R-Mode among others. Further details could be found in the working group report.

5. REVIEW OF INPUT PAPERS

Input papers were numbered in line with the agenda and allocated to the relevant Working Group. The late input papers were referred for the participant attention.

The Maritime Buoyage System input from ARM (ENAV28-5.2.11 and ENAV28-5.2.11.1) was especially addressed and requested to be reviewed during the session. A liaison back to ARM would be expected if needed.

6. ESTABLISH WORKING GROUPS AND TASK GROUPS

The Chair invited all Working Group Chairs to introduce the work planned for ENAV28.

Working Group (WG)	Working Group Chair / Vice Chair
WG1 – Digital Information System	Axel Hahn – Julius Möller / Jin Park
WG2 – Emerging Digital Technology	Jillian Carson-Jackson / Ernie Batty
WG3 – Digital Communication System	Stefan Pielmeier / Stefan Bober

7. WORKING GROUP 1 – DIGITAL INFORMATION SYSTEM (WG1)

In the 28th session of the ENAV committee, the WG1 – Digital Information System worked on several tasks regarding cyber security, AtoN technical service specification, Maritime Services and e-Navigation guidance documents. The WG1 reviewed five input papers, three task groups (including an intersessional TG on the AtoN technical service specification) were established and a revision of the Guideline 1128 (ENAV28-12.1.1) and the Liaison note to PAP on proposal of amendment of maritime service for MASS (ENAV28-12.1.2) were produced. The following sections provide detailed descriptions of the work.

7.1 Review of Work Plan

Referencing Document(s): ENAV28 WG1 Work Program

The workplan was introduced, reviewed and adopted by the WG.

7.2 Task 2.2.1 on Developing Technical Service Specifications for the Provision of AtoN Information

Task leader: Thomas Christensen

Referencing Document(s): None.

The ARM WG2 is progressing on the S-201 and S-125 data models for the management of AtoN information. During ENAV27, it was considered to develop a technical service specification for a service that may utilize these data models. The TG was established under the name “Development of a Technical Service Specification for the provision of AtoN information”. In continued work, the current state of the service specification was reevaluated and details of the operational context and the service interfaces were discussed. The TG decided to start with the specification of a service that provides S-125 data to end-users. The current working document that includes a draft of this service specification was titled “Technical service specification for the provisioning of AtoN information to end-users using the S-125 data model”. In addition to that, there

was a joint meeting with the ARM S-201 TG to discuss further requirements of such a service. The task group plans two inter-sessional meetings, which will be published via the IALA website.

Output Document(s): ENAV28-12.1.3 Draft Technical service specification for the provisioning of AtoN information to end-users using the S-125 data model

Action item

*The **IALA Secretariat** is requested to submit the working paper ENAV28-12.1.3 Draft Technical service specification for the provisioning of AtoN information to end-users using the S-125 data model as an input paper to ENAV29.*

*The **Committee participants** are encouraged to contribute to working paper ENAV28-12.1.3 Draft Technical service specification for the provisioning of AtoN information to end-users using the S-125 data model and to provide input to ENAV29.*

*The **Committee participants** are encouraged to participate in the intersessional group working on the development of Draft Technical service specification for the provisioning of AtoN information to end users by means of the S-125 data model and contact Thomas Christensen (thomas@dmc.international) by 29/11/2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard.*

7.3 Task 2.4.2 on Cyber Security

Referencing Document(s): (ENAV28-5.1.1.4) The analysis of general cybersecurity requirements applicable to ship's e-Nav service display device based on international standards

(ENAV28-5.2.12) The liaison note from VTS on the Response to Work on Cyber Security within IALA.

An input paper that discusses the requirements for cybersecurity regarding e-Navigation service display devices (ENAV28-5.1.1.4) was provided to the WG1. This document analyses international standards and brings them into the context of the display devices. During the WG1 plenary sessions the document was presented by the authors. A task group on Cyber Security has not been established during this committee meeting. In agreement with the cyber security workshop steering committee and in collaboration with the ARM14 WG2 task group on cyber security, it was decided to forward the paper to the IALA cyber security workshop in November as a resource document due to its direct thematic reference to the planned topics. The authors of ENAV28-5.1.1.4 approved with this approach.

VTS provided a liaison note regarding the Cyber Security Workshop in November and the management of cyber security guidance in IALA (ENAV28-5.2.12) and requested to note this information. The WG1 noted the liaison note and had no further comments. Similar to ENAV28-5.1.1.4 this document was also forwarded to the cyber security workshop.

Action item

*The **IALA Secretariat** is requested to forward the input papers ENAV28-5.1.1.4 and ENAV28-5.2.12 to the IALA cyber security workshop as a resource document.*

7.4 Task on MASS Requirements for Maritime Services

Task leader: Jin H. Park

Referencing Document(s): ENAV28-5.1.2.2 Proposal on amendment of Maritime Services (MS) for MASS

An input paper (ENAV28-5.1.2.2) that discusses the requirements for Maritime Services in the context of MASS was provided to the WG1. This document analyses different degrees of automation and maritime services and proposes considerations for MS regarding machine readability, remote control centres and monitoring. A new maritime service for remote control and monitoring is proposed. The contents of this input paper were presented by the authors during the WG1 plenary sessions. It was recognized as an important contribution for future developments of Maritime Services in the context of MASS. Also, it was mentioned that the concept of remote control and monitoring services (RCMS) for MASS and its importance for IALA should be evaluated. A task group that deals with how maritime services in the context of e-

navigation could be amended or extended by a new RCMS service to support operation or navigation of MASS was established. And a liaison note to PAP (MASS task force) was produced, including a request for further analysis of establishing RCMS as a new MS.

Output document(s): ENAV28-12.1.2 Liaison Note to PAP: Proposal of remote control and monitoring service as a new Maritime Service (MS) in the context of e-Navigation

Action item

The IALA Secretariat is requested to forward ENAV28-12.1.2 Liaison Note to PAP: Proposal of remote control and monitoring service as a new Maritime Service (MS) in the context of e-Navigation to PAP.

The Committee participants are encouraged to provide input papers to ENAV29 regarding technical services that could be used for the implementation of RCMS.

7.5 Task 2.2 on Revision of IALA G1128

Task Leader: Per Löfbom

Referencing Document(s): ENAV28-5.1.1.3 Change Proposal for IALA G1128 on the specification of e-Navigation technical services

The Guideline 1128 provides information on how to develop specifications of e-Navigation Technical Services. In the past years, efforts have been made to use the guideline and its templates to successfully develop service specifications for maritime services, especially in the context of the Maritime Connectivity Platform. However, while applying the principles and templates as well as the supplied xsd-Schemas some smaller problems, or open points in the guideline could be identified and were presented in the input paper ENAV28-5.1.1.3. Therefore, a task group was established to revise the guideline while including the provided feedback. The task group created a revised version, which was forwarded to the silent approval process. One comment was received during the approval period, that emphasized the relevance of the S-100 data model (for technical services) and that IALA should keep the concept of S-100. The comment did not contradict the contents of the guideline and the revised version was forwarded to the Council for final approval.

Output Document(s): ENAV28-12.1.1 Revision of G1128 on the specification of e-Navigation technical services

Action item

The IALA Secretariat is requested to submit the Revision of Guideline 1128 on the specification of e-Navigation technical services (ENAV28-12.1.1) to the Council for approval.

7.6 Task on the Status of the MCP

Referencing Document(s): ENAV28-5.1.1.2 Status on MCP and its role in e-Navigation

In the input paper ENAV28-5.1.1.2 a status update on the development and realisation of the MCP, as well as a description of its intended place in the overall e-Navigation concept and the digitalisation process of the maritime domain at large was provided. Further, it was mentioned that a major milestone for the MCP was achieved as a full specification of the Maritime Identity Registry (one of three main components of the MCP) had been released recently. The contents of the input paper were presented to the WG1 by Thomas Christensen (secretary general of the MCP consortium).

7.7 Task 2.2.3 on the Position Paper on Maritime Services

Referencing Document(s): None.

This topic was originating from Task 2.2.3 in the WG1 task list: Develop a Position Paper on the concept of Maritime Services as basic concept of eNavigation (Quality of Services, Service Level Agreements). As item addressed in section 7.4 may have significant impact on this task, it was decided to postpone the work on this task to the next sessions.

7.8 Task 2.4.1 / 2.4.3 on Maritime Resource Names

Referencing Document(s): None.

During the plenary sessions of WG1 it was reported by Jin H. Park and Thomas Christensen that there is ongoing work between the IALA secretariat and KRISO on a concept for a Maritime Resource Registry (MRR) that could enhance the management of maritime resources by IALA. This concept may be presented to the Committee in the next ENAV session.

8. WORKING GROUP 2 – EMERGING DIGITAL TECHNOLOGY (WG2)

The Chair and Vice-Chair of the Working Group thanked all participants for their hard work during the session.

A number of WG sessions, were held over the course of the session. The WG focused on the following tasks:

- Task 1.1.5 on Review of Emerging Technologies
- Tasks 3.1.2, 3.1.4 to Develop a Recommendation on the Maritime Radio Communication Plan (MRCP) (deprecate the MRCP).
- Tasks 3.4, 3.4.2 to Monitor developments in International Mobile Technologies (IMT) (formerly referred to as 3GPP), liaise with IMO NCSR regarding 3GPP activities
- Tasks 4.1.1, 4.1.2, 4.2.1 Related to MASS (liaise with IMO; Monitor and report on emerging technologies to support and develop IALA position paper on MASS)
- New task proposal – Artificial Intelligence / Machine Learning Guideline

All input papers for WG2 were addressed. The working group continued its work to identify future work items for work term 2023-2027 and potential work items were agreed to be forwarded for further consideration.

8.1 Task 1.1.5 on review of Candidate Technologies

Referencing Document(s): ENAV28-5.1.2.4; 5.1.4.2.1 and 5.1.2.4.2 were reviewed.

To support the understanding of the input on Orolia Template Review emerging technologies ENAV28-5.1.4.2.1, J Fischer of Orolia provided a presentation on [Maritime interference, Detection, and Mitigation \(IDM\) for Global Navigation Satellite System \(GNSS\)](#), focussing on resilient Positioning, Navigation and Timing (PNT), based on the following technologies:

1. Jamming / spoofing signal mitigation using passive GNSS antennas that reduce low elevation GNSS signals by up to 20dB
2. Jamming / spoofing signal mitigation using active GNSS antennas that can null out interfering GNSS signals
3. SecureSync enabled GNSS interference detection
4. M-SecureSync is a feature enhanced SecureSync capability.

Addressing specific maritime use cases, M-SecureSync looks at precision GNSS, RF threat detection and alerts, GNSS augmentation and signal protection.

The IALA Guideline 1153 Technology Review Template for Orolia (ENAV28-5.1.2.4.1), was reviewed in detail. Several items were identified for further discussion and development, including clarification of items noted as 'Amber' in order to update the Technology Review Template. It is expected that the detailed review will be completed at ENAV29.

Members are reminded of the opportunity to identify candidate technologies for review, using the template provided in IALA Guideline 1153.

Action item

*The **Committee participants** are requested to provide information on candidate technologies for review using the template provided in IALA Guideline 1153.*

The IALA Secretariat is requested to forward the working documents on the review of the passive and active GNSS antenna systems and the Orolia SecureSync and M-SecureSync (ENAV28-12.2.2) to ENAV29.

8.2 Task 2.2.10 on Maritime Internet of Things

Task Group Leader: E Batty

This task is related to tasks 1.1.5 and 3.4.2. The group noted the draft Guideline on the Internet of Things (ENAV27-12.2.7) being reviewed by other IALA committees and the IALA Secretariat, no work was carried out on this task at ENAV28.

Action Item

The IALA Secretariat is requested to forward any input received on developments within other IALA Committees on the internet of things to ENAV29 for further consideration.

8.3 Task 3.1.2, 3.1.4 on Maritime Radio Communication Plan

Task Group Leader: E Batty

Noting the agreement at ENAV28 to evolve the MRCP into an IALA Manual, several intersessional meetings were held to commence the work. The resulting draft document was reviewed at ENAV28, noting work will continue through intersessional work. Meetings for the intersessional work will be published on the IALA dashboard.

Action item

The IALA Secretariat is requested to forward the draft IALA Maritime Communications Manual (ENAV28-12.2.3) to ENAV29.

The Committee participants are encouraged to participate in the intersessional group working on the development of the Maritime Communications Manual and contact Ernie Batty (ernie.b@imisglobal.com) by 12 November 2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard.

8.4 Task 3.4, 3.4.2 on Developments in IMT (3GPP)

Task Group Leader: J Carson-Jackson

Referencing Document(s): ENAV28-5.1.2.3, 5.1.2.3.1 related to International Mobile Telecommunications as well as ENAV27-12.2.6 were reviewed. A presentation on the work at 3GPP was provided by H. Koo. The draft documents on IMT were reviewed, including the updating of the IALA liaison request from IMO (as referenced in paragraph 8.9 of document NCSR 7/12) to IMO/ITU Experts Group on developments in IMT.

The time-line for submissions to IMO/ITU EG was noted, and the input provided to IMO/ITU EG 17 was reviewed (IMT/ITU EG 17/Inf.2). Additional comments on the document were noted. The process for further revision of the document was agreed:

- Comments on IMO/ITU EG17/Inf.2 will be identified to 3GPP TSG SA via the IALA/3GPP liaison, H. Koo.
- Amendments will be provided to ENAV29 for the next version of the liaison note, to be provided to IMO/ITU EG 18.
- At ENAV 29 the next version of the liaison note will be drafted and agreed, for forwarding to IMO/ITU EG 18.

During the meeting H. Koo provided further detail on the release development process, with specific reference to release 17. It was agreed that details on the release and stages process will be included in the next version of the liaison note to IMO/ITU EG.

Action Item

The IALA Secretariat is requested to continue the liaison with 3GPP and provide an update on the work at the IMO on IMT to ENAV29.

The IALA Secretariat is requested to send the draft IALA liaison to IMO-ITU Expert Group 18 (2022) to 3GPP TSG SA via H. Koo, liaison for 3GPP/IALA.

8.5 Task 4.1.1, 4.1.2, 4.2.1 on MASS from marine AtoN point of view

Task Group Leader: J Carson-Jackson

Referencing Document(s): ENAV28-5.1.2.2, 5.2.2, 5.2.10, 5.2.11.1, 5.2.14, 5.2.14.1, 5.2.15, and 5.2.15.1 were reviewed.

The publication of IALA G1161 - Evaluation of platforms for the provision of maritime services in the context of E-Navigation was noted. Considering the discussion on infrastructure to support MASS from an AtoN point of view, Thomas Christensen provided a presentation on [the Maritime Connectivity Platform and MASS](#).

The Committee agreed that a revision of G1107 (as proposed in ENAV28-5.2.10) would be valuable to support the consistent reporting of test beds, going beyond the initial purpose of the guideline for reporting on test beds related to e-navigation. It was agreed that the task would be scoped in line with the input paper and the discussion at ENAV28, for further development intersessionally and at ENAV29.

The committee reviewed the MASS area of the revised MBS and provided input to section 3.2.6 which was developed in conjunction with WG3.

Following initial review, it was noted that ENAV28-5.1.2.2 – Proposal on amendment of Maritime Services (MS) for MASS was dealt with by WG1.

Following the provision of the draft IALA Recommendation and Guideline on MASS for further development within the broader IALA framework, WG2 had initially considered the work on this item was complete. Based on the input from the VTS Committee and the presentations received at ENAV28, WG2 agreed to continue work on this item in conjunction with the work of the IALA MASS Task Group.

Action item

The IALA Secretariat is requested to advise the IALA MASS Task Group that the IALA G1107 is being revised by ENAV Committee to support a broader approach for test beds related to the digital transformation of the maritime environment.

The Committee Participants are encouraged to participate in the intersessional group working on the revision of G1107 and contact Jillian Carson-Jackson (jillian@jcjconsulting.net) by 12 November 2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard.

8.6 Task 4.3.1, 4.3.5, 4.3.10 on Technologies to facilitate the implementation of Maritime Single Window (MSW)

Based on the intersessional work that had been carried out, input papers identified for review at ARM were reviewed. The committee noted the developments at IMO FAL, including the revision of the IMO Fal.5/Circ.42/Rev.1 on Guidelines for setting up Maritime Single Window.

As noted by the IMO

(<https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/FAL45thSession.aspx>):

“The newly approved amendments will make it mandatory for public authorities to establish, maintain and use single window systems for the electronic exchange of information required on the arrival, stay and departure of ships in ports. In addition, public authorities will have to combine or coordinate the electronic transmission of the data so as to ensure that information is submitted or provided only once and re-used to the maximum extent possible.

During the session, the Committee approved revised guidelines for setting up an MSW, updating the previous provisions, and agreed to create a new GISIS module to share information on maritime single windows implemented by Member States.”

Based on the discussions, a liaison note was developed highlighting the fact that that MSW is being discussed in a number of other organisations, specifically ISO group ISO/TC 8/SC 11 – Intermodal and Short Sea Shipping. Related to this work, a number of relevant documents that should be considered in the discussions on MSW and technologies to support MSW, which appear to include ISO/PAS 28005-1:2012.

Action item

*The **IALA Secretariat** is requested to forward the liaison note to ARM and PAP regarding Ship Reporting Guideline ENAV28-12.2.1 for further consideration in the work by IALA on Maritime Single Window.*

*The **IALA Secretariat** is requested to obtain the ISO/CD 28005-1 document that deals with the MSW and share this with the IALA membership to support coordination of the work on MSW.*

*The **IALA Secretariat** is requested to consider the most appropriate manner to be engaged with the related work on MSW at the ISO group ISO/TC 8/SC 11*

8.7 Artificial Intelligence and Machine Learning

Task Group Leader: E Batty

Referencing Document(s): ENAV28-5.1.2.1, 5.1.2.1.1 related to the development of guideline on the development and use of AI/ML within the domain of IALA.

The work confirmed the focus of the task as identified in the task proposal. Following a presentation on the input paper to WG2, a draft guideline was developed and reviewed. The guideline will be further developed during intersessional activity. Meetings for the intersessional work will be published on the IALA dashboard.

Action item

*The **IALA Secretariat** is requested to forward the draft Guideline on Artificial Intelligence and Machine Learning within the domain of IALA (ENAV28- 12.2.4) to ENAV29.*

*The **Committee participants** are encouraged to participate in the intersessional group working on the development of the draft Guideline on Artificial Intelligence and Machine Learning within the domain of IALA and contact Ernie Batty (ernie.b@imisglobal.com) by 12 November 2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard.*

8.7 Proposed work items for IALA Work Term 2022-2026

Building on the work commenced at ENAV27, a number of proposed task items were identified. These were scoped into new task proposals for further consideration by the IALA ENAV Committee Management Team.

Action item

*The **IALA Secretariat** is requested to forward proposed new task listed in the IALA Nextcloud folder: ENAV28 WG2/WG2 General/Potential Work Items, as provided in the task proposal templates, to PAP for consideration in the development of the future work programme for IALA Committees in 2023-2027.*

8.8 Presentations

A number of presentations were arranged which included the presentation by Orolia (reported at item [1.1] as part of the technology evaluation process of WG2. These presentations are available in the IALA Presentation [repository](#) and through this [link](#).

- Maritime Connectivity Platform and MASS - Thomas Christensen
- Non-linear decision support and automation in VTS - Todd Schuett
- DAB+ (Digital VHF radio) - Frank Montenij & Bastiaan Teeuwen
- Global Digital Route Testbed - Michael Bergman

9. WORKING GROUP 3 – DIGITAL COMMUNICATION SYSTEM (WG3)

9.1 Synopsis of the session

The working group planned the coming activities and strategy for making VDES a complete e-Navigation transport mechanism. Intersessional meetings were planned to bring this work forward.

The group also reviewed further new work items to be proposed for the next 2023-2027 work plan.

9.2 General

9.2.1 Status

ENAV Task list (ENAV28-12.0.3) walked through and updated the status.

The group took note on the status from:

- IMO: many countries support amending SOLAS chapter IV and V with VDES as alternative for AIS. During NCSR 9, the VDES performance standard will be discussed together with the amendments of SOLAS entry into the force on 1st January 2026.
- IEC: The joint IALA and IEC work group meetings were held virtually, due to COVID 19.
- ITU: the group noted the results of ITU-R WP5B referred in the input paper IALA Report of ITU-R WP5B meeting November 2021 (ENAV28-3.5.2)
- RTCM: SC121 can help to standardize how e-Navigation over VDES can happen, ASM's offloading from AIS1 and AIS2 to the new channels, SC138 starts working on R-mode in 1Q 2022
- MCC: Stefan Pielmeier reported about the progress happening around the development

9.2.2 Inputs

Referencing Document(s): The following documents were reviewed and allocated to the tasks:

ENAV28-5.2.11.1 Draft WP The IALA Maritime Buoyage System

- Task 3.2 on VDES:

ENAV28-5.1.3.1 R-mode authentication (describing a novel narrow-band signature algorithm)

ENAV28-5.1.3.2 VDE-SAT R-mode considerations

- New Task (new work programme):

ENAV28-5.1.3.4 Proposal for the development of Guideline on VDL integrity monitoring

ENAV28-5.1.3.3 Proposal on the discussion of VDES resource sharing

- Change proposal received and collected through the nextcloud folder (ENAV-WG3-20211004 ENAV28-Input-G1139 Change proposal):

The group received 3 VDES clarification documents which were handled as part of the Task 3.2 on VDES session.

9.2.3 New Work Programme 2023-2027

The group reviewed the current work programme proposals:

Input from China MSA on Proposal for the development of Guideline on AIS/VDES VDL integrity monitoring (ENAV28-5.1.3.4), Yi Jiang presented the draft guideline. Due to its important nature, the group proposed this new work item to start at ENAV29 on: "Provide guideline of services and functions for relative authorities to monitor the integrity of AIS/VDES VDL".

After a presentation from GLA on authentication for VDES, the group proposed this new work item: "Develop Guidelines on VDES Authentication Techniques" starting at ENAV31.

After a presentation from OPRI, the group proposed this new work item, starting at ENAV29: “Develop Guidelines on VDES resource sharing and coordination/cooperation”.

All proposed new work items are part of the document WG3 New work items proposal 20211015 (ENAV28-12.3.1).

Action item

*The **IALA Secretariat** is requested to forward the proposed new task listed in the document WG3 New work items proposal 20211015 (ENAV28-12.3.1), to PAP for consideration in the development of the future work programme for IALA Committees in 2023-2027 or to the next ENAV meetings.*

9.3 Task 3.2 on VDES

The group was informed by Johnny Schultz that the latest revision of VDES contains the changes made by WP5B chair John Mettrop is found in Committees/ENAV/WG3/ENAV28/INPUT/G1139/ R19-WP5B-C-0355!N12!MSW-E.docx.

All future change proposals are asked to be made as changes to this version, as it is the best candidate revision for the official ITU-R M.2092-1.

The group reviewed the clarification inputs found in Committees/ENAV/WG3/ENAV28/INPUT/G1139:

- ASM clarification on the ASM Identifier: change will be kept for “WD toward PDR 2092-1”
- VDE-SAT 5 changes proposed by Kongsberg: “20211011_M2092-0_KSX_proposed_changes.docx”; will be discussed further intersessionally
- VDE-SAT 4 changes proposed by China MSA, Zhe Zhang: “G1139 change proposals_Zhe Zhang.docx”

The group decided to keep the ongoing proposals work in a “Working Document toward PDR 2092-1” from ENAV29 on, to be kept in the WORKING folder of each ENAV. Johnny Schultz volunteered for keeping the changes in a changelog and the Working Document aligned.

Proposed changes will be reviewed and discussed by the group before they are accepted into the “Working Document toward PDR of 2092-1”.

The group discussed the status of Preliminary Draft Revision ITU-R M.2092-0 at ITU. Christian Rissone and Ross Norsworthy proposed that an administration could actually create an official input to WP5B in order to request to upgrade the Preliminary Draft Revision of ITU-R M.2092-0 to a Draft Revision and send it to SG5 for the approval process.

After the publication of ITU-R M.2092-1 by ITU, expected for 1Q 2022, the group will assess the state of the “Working Document toward PDR 2092-1” and eventually produce an input to WP5B.

The revision of G1117 and R1007 were not progressed and will be carried over to the next session.

Action item

*The **Committee participants** are requested to share their findings on VDES clarification for potential integration into the Working Document toward PDR 2092-1 during the WG3 virtual intersessional VDES clarification meeting scheduled on 19th November and 13th December at 11.00-14.00 UTC.*

The document addressing such matter is available through the following link:

Committees/ENAV/WG3/ENAV28/INPUT/G1139/ R19-WP5B-C-0355!N12!MSW-E.docx in the form of change proposals on ITU-R M.2092-1

The template is available here:

<https://nextcloud.iala-aism.org/index.php/f/34704>.

The WG chair reported about the plan to start the VDES Alliance, registration for the inaugural meeting and review of terms can happen for all interested parties to info@vdes-alliance.org. The VDES-Alliance concentrates on interoperability between VDES implementations from different producers, more details can be found at <https://www.vdes-alliance.org>.

9.3.1 VDES Roadmap

The group created a VDES Roadmap working document, to visualize the ways how to get mature and harmonized standards for all components needed to create full e-Navigation systems with VDES. The following 4 figures show the major aspects of the VDES [roadmap](#).

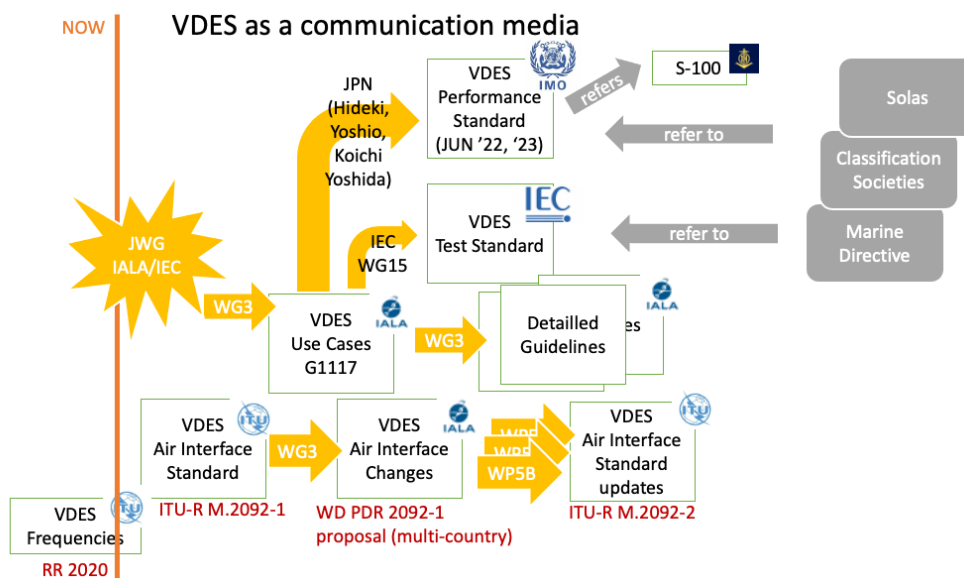
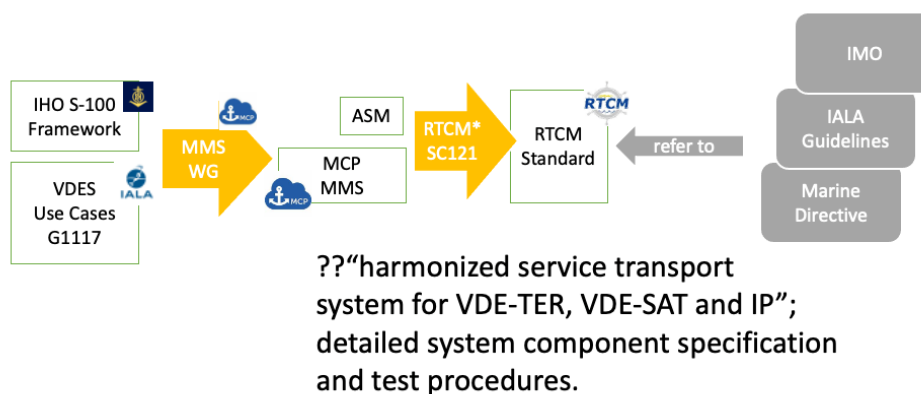


Figure 2 - VDES as a communication media Roadmap

VDES Integrated Service Architecture



*: to be decided e/o October by RTCM

Figure 3 - VDES integrated service architecture roadmap

VDES R-mode

R-mode can be used *as a experimental fallback system* under Article 4.4 until WRC-27 allocates the frequencies for RNS and RNSS* as well. Today only Maritime Mobile Service and Maritime Mobile Satellite Service is allocated.

*Radio Navigation (Satellite) Service

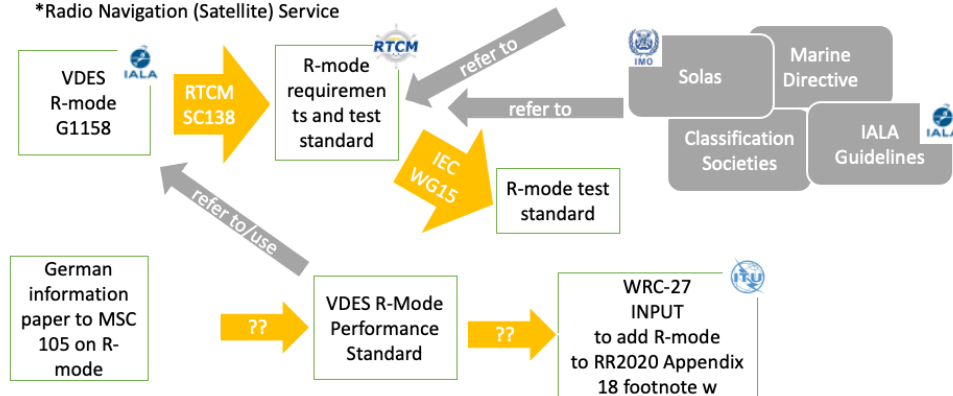


Figure 4 - VDES R-mode roadmap

Get primary allocation for VDE-SAT DL for VDE-SAT R-mode



Figure 5 - Primary allocation for VDE SAT DL for VDE SAT R-mode roadmap

9.3.2 Task 3.2 on Review G1117 VHF Data Exchange System (VDES) Overview

The group intends to prepare a new revision of G1117 to be used as input for the preparation of a IMO VDES performance standard at NCSR 9, it needs to be notified to IMO by IALA at the end of February 2022, that such a new revision is/will be available. The new G1117 revision publishing is planned after ENAV29.

As input for the work, the group considered the use case analysis work performed by the Joint IEC TC80 WG15/IALA ENAV WG3 working group, see a static version at:

Committees/ENAV/WG3/ENAV28/WORKING/G1117/20211014_JWG_IECIALA_VDES_useses.xlsx.

Koichi Yoshida informed the group that ISO TC8 is started working on a low-data rate communications that is robust in heavy weather for the application in MASS.

Action item

The **Committee participants** are invited to participate in the joint IEC TC80 WG15 and IALA ENAV WG3 Intersessional meeting in the Netherlands from 10th of January 2022 at 08:00 UTC to the 14th of January 2022, 11:00 UTC.

The **IALA Secretariat** is requested to add the “ENAV WG3/IEC TC80 WG15 joint working group intersessional workshop on IALA G1117” to the calendar.

More details on the precise location will follow on the ENAV committee calendar and it was informed that the COVID entry regulations of the Netherlands could be consulted via the following site:

<https://www.government.nl/topics/coronavirus-covid-19/visiting-the-netherlands-from-abroad/checklist-entry/from-outside-the-eu>.

9.3.3 VDE R-mode

Ronald Raulefs shared a status update on VDE R-mode available through the Nextcloud folder link below: Committees/ENAV/WG3/ENAV28/INPUT/presentations/VDES_RMode_ENAV28.pptx).

Action item

*The **Committee participants** are requested to review and propose changes to the IALA Guideline on VDES R-mode G1158 for the next ENAV29 committee meeting or discuss issues with Ronald Raulefs (ronald.raulefs@dlr.de) at any time.*

The group noted that Germany will provide an information paper to NCSR 9.

Action item

*The **Committee participants** are requested to ask for a new work item at IMO MSC level to task NCSR with the creation of an IMO performance standard on VDES R-mode. Please coordinate with Ronald Raulefs.*

As informed during the working meetings, the ITU radio regulations do not allocate currently the VDES frequencies to be used for Radio Navigation Services or Radio Navigation Satellite Services, so the use of R-mode on VDES frequencies under footnote w of Appendix 18 of the radio regulations is currently not sanctioned by ITU. Changing the radio regulations is only possible at WRC-27 happening in 2027.

The group was informed about the activities at ENG and RTCM and the list of currently published papers and testbeds (see the above referred presentation).

Jan Safar presented the current state of signature based authentication, and an improved method for a potential VDES Authentication solution, for R-mode and other VDES e-Navigation services, minimizing the overhead by authentication using the TESLA protocol, please refer to the presentation allocate in the Nexcloud folder: Committees/ENAV/WG3/ENAV28/INPUT/presentations/.

Members interested in authentication for low-bandwidth communications are invited to review that presentation for application to our e-Navigation services that use transmission intervals.

Francisco Lazaro presented the authentication possibilities for VDES R-mode currently under investigation, please refer to the presentation allocate in the Nexcloud folder:

Committees/ENAV/WG3/ENAV28/INPUT/presentations/An Authentication Concept for VDES R-Mode_v2.pdf.

Jan Safar presented the input paper on VDE-SAT R-mode considerations (ENAV28-5.1.3.2). The group answered all questions of section 3.3 and encouraged Jan Safar to prepare a VDE-SAT change proposal towards our planned WD on PDR of ITU-R 2092-1 to improve the total system.

9.4 Task 3.1 on MRCP

The group was represented by Yoshio Miyadera (JRC) in the work on MRCP organized of WG2.

9.5 Task 2.2 on Support WG2 in the development of a Rec. on Maritime IoT

The group didn't receive any inputs from WG2 on the topic, therefore this task was not progressed further and will be carried over to the next session.

9.6 Task 3.3 on Revision of AIS documentation

The group discussed the strategy of updating A-123 and A-124 to the new document style and to contain VDES. The group is waiting on the feedback from PAP on the WG3 proposal for a new AIS documentation structure.

The strategy proposed by the group is to create a new "Guideline on VDES shore infrastructure" which will include the relevant content of A-123 and A-124, and the new VDES aspects.

10. REVIEW OF OUTPUT AND WORKING PAPERS

The Working Group Chairs reported on the work carried out by their Working Groups.

The output documents listed at Annex E were reviewed and agreed.

The Committee Chair then thanked the Working Group Chairs, Vice Chairs, and participants of the working groups for all their efforts during the week.

11. REVIEW OF SESSION REPORT

The report of the meeting (ENAV28-12.1) was reviewed and approved by the Committee.

Action Item

*The **IALA Secretariat** is requested to send the report of ENAV28 (ENAV28-13.1) to the Council to note.*

12. DATE AND VENUE OF NEXT MEETINGS

ENAV29 is planned to be held between 14 March to 18 March 2022 at Headquarters, Saint Germain-en-Laye. The secretariat will continue to monitor global events of the COVID-19 pandemic and advise its Members of any changes that may be instigated.

Other IALA events will be publicised on the IALA website.

13. CLOSING OF THE MEETING

The Committee Chair thanked the Committee and Working Group chairs for their active participation, accommodation, effectiveness, hard work and diligent outputs during the session.

He also hoped that everyone could take the survey that is sent out after every Committee session in order to receive feedback for continuous improvements.

The Chair hoped to see all participants at ENAV29.

14. LIST OF ANNEXES

- A. Agenda
- B. List of Participants
- C. List of Input Papers
- D. List of Output Papers
- E. List of Action Items



28th Meeting of the e-Navigation Information Services and Communications Committee (ENAV28)

The 28th meeting of the **ENAV Committee** will be held from 11 to 29 October virtually.

The opening plenary will commence at 1000 – 1200 UTC on Monday 11 October 2021, and the closing plenary will begin at 1000 – 1200 UTC on Friday 29 October.

Agenda

1. Introduction
 - 1.1. Welcome from the Secretary-General/Deputy Secretary-General
 - 1.2. Approval of agenda Hideki Noguchi
 - 1.3. Apologies and introductions Hideki Noguchi
 - 1.4. Working arrangements Jaime Alvarez
 - 1.5. Recalling the Style Guide Jaime Alvarez
2. Review of action items from last meeting
 - 2.1. Review of action items from ENAV27 Hideki Noguchi / Jaime Alvarez
3. Reports from other bodies:
 - 3.1. IALA
 - 3.1.1. IALA Council Minsu Jeon
 - 3.1.2. Policy Advisory Panel (PAP) Minsu Jeon
 - 3.1.3. IALA World-Wide Academy Kevin Gregory
 - 3.1.4. MASS group update Captain Segar
 - 3.2. Digital@Sea Minsu Jeon
 - 3.3. IMO Hideki Noguchi
 - 3.4. IHO Minsu Jeon
 - 3.5. ITU Stefan Bober
 - 3.6. IEC Stefan Bober / Jorge Arroyo
 - 3.7. RTCM Jorge Arroyo
 - 3.8. ETSI Derek Love
 - 3.9. 3GPP Minsu Jeon
4. Online Presentations
 - 4.1. VDES update Lars Moltsen
 - 4.2. VDES Alliance Stefan Pielmeier
 - 4.3. MASS developments in VTS Committee Neil Trainor
 - 4.4. Resilient PNT J Fisher (20 October 10.30 UTC)
 - 4.5. SBAS Standardisation Rodrigo Gonzalez
 - 4.6. Proposal of initiating discussion on the VDES resources sharing Koichi Yoshida

- | | | |
|-------|---|------------------------|
| 5. | Review of input papers | |
| 5.1. | Introduction of input papers to ENAV28 | |
| 5.2. | Allocation of input papers | Committee Chairs |
| 6. | Work Programme and task list (2018 - 2023) | |
| 6.1. | WG1 Working program and arrangements presentation | Axel Hahn |
| 6.2. | WG2 Working program and arrangements presentation | Jillian Carson-Jackson |
| 6.3. | WG3 Working program and arrangements presentation | Stefan Pielmeier |
| 6.4. | Work program 2023 to 2027 | |
| 7. | WG1 – Digital Information System | |
| 7.1. | S-100 & S-200 | |
| 7.2. | Maritime Services | |
| 7.3. | Cyber security | |
| 7.4. | Maritime Resource Name | |
| 7.5. | Rapporteurs | |
| 8. | WG2 – Emerging Digital Technology | |
| 8.1. | Maritime Autonomous Surface Ship | |
| 8.2. | Digital Voice Communications | |
| 8.3. | Single Window Data Exchange | |
| 8.4. | Rapporteurs | |
| 9. | WG3 – Digital Communication System | |
| 9.1. | Maritime Radio Communication Plan | |
| 9.2. | VHF Data Exchange System (VDES) applications | |
| 9.3. | Autonomous Maritime Radio Device (AMRD) | |
| 9.4. | Maritime Services | |
| 9.5. | Automatic Identification Systems | |
| 9.6. | Other digital communication technology | |
| 9.7. | Rapporteurs | |
| 10. | Any Other Business | |
| 11. | Establish Working Groups and task groups | |
| 12. | Review of output and working papers | |
| 12.1. | Working Group reports | |
| 12.2. | Working papers | |
| 12.3. | Output papers | |
| 13. | Review of session report | |
| 14. | Date and venue of next meeting | |
| 15. | Close of the meeting | |

ANNEX B

LIST OF PARTICIPANTS

Surname	Name	Member Country	Affiliation	Email
YEN	Kai	Singapore	A*STAR-I2R - Institute for Infocomm Research	
CAIRNS	Bill	United States	American Pilots' Association Inc	bcairns@americanpilots.org
MARTIN	Guillaume	France	AMG Microwave	g.martin@amg-microwave.com
ALIMCHANDA NI	Mahesh	Australia	Australian Maritime Safety Authority	
BONSER	Nicholas	Australia	Australian Maritime Safety Authority	nicholas.bonser@amsa.gov.au
SHEPARD	Stuart	Australia	Australian Maritime Safety Authority	stuart.shepard@amsa.gov.au
BERGMANN	Michael	CIRM	BM Bergmann Marine	michael.bergmann@bergmann-marine.com
PETROV	Petar	Bulgaria	Bulgarian Ports Infrastructure Company	pe.petrov@bgports.bg
COUTU	Jean-Francois	Canada	Canadian Coast Guard	jean-francois.coutu@dfo-mpo.gc.ca
RIENDEAU	Natacha	Canada	Canadian Coast Guard	natacha.riendeau@dfo-mpo.gc.ca
MINGOT	Pierre	France	CEREMA	pierre.mingot@cerema.fr
HUAI	Shuaiheng	China	China Maritime Safety Administration	huaishuaiheng@dlmu.edu.cn
SUN	Xiaowen	China	China Maritime Safety Administration	
XUWEI	Iv	China	China Maritime Safety Administration	chinamsalxw@126.com
YANG	Liang	China	China Maritime Safety Administration	brightman.cmsa@gmail.com
YANG	Li	China	China Maritime Safety Administration	
LANE	Philip	United Kingdom	CIRM	pl@cirm.org
LOVE	Derek	United Kingdom	CML Microcircuits	dlove@cmlmicro.com
WINTER	Pieter	United Kingdom	CML Microcircuits	

BOYLE	Ronan	Ireland	Commissioners of Irish Lights	
JIANG	Yi	China	Dalian Maritime University	
MØLLER	Ulla Bjørndal	Denmark	Danish Maritime Authority	ubm@dma.dk
GAIDAI	Oleg	Russia	Department of Navigation and Oceanography	oleg_highday@mail.ru
HERNOE	Xavier	France	Direction des affaires maritimes- Ministère de la Mer	xavier.hernoe@developpement-durable.gouv.fr
WANG	Michael	China	Dongnan (Southeast) University	
BORGHESE	Francesco	Italy	ELMAN S r l	f.borghese@elmansrl.it
GARCIA DAROCA	Carlos	Spain	ESSP-SAS	carlos.daroca@essp-sas.eu
GONZALEZ	Rodrigo	Spain	ESSP-SAS	
SIHT	Alar	Estonia	Estonian Transport Administration	alar.siht@transpordiamet.ee
RITTERBUSCH	Jochen	Germany	Federal Maritiem and Hydrographic Agency	jochen.ritterbusch@bsh.de
BOBER	Stefan	Germany	Federal Waterways and Shipping Administration	stefan.bober@wsv.bund.de
HEIKONEN	Kaisu	Finland	Finnish Transport Infrastructure Agency	kaisu.heikonen@ftia.fi
MARTIKAINEN	Tuomas	Finland	Finnish Transport Infrastructure Agency	tuomas.martikainen@vayla.fi
PITKÄNEN	Juho	Finland	Finnish Transport Infrastructure Agency	juho.pitkanen@fintraffic.fi
KIMURA	Daisuke	Japan	Furuno Electric Co Ltd	
NAKAGAWA	Hiroyasu	Japan	Furuno Electric Co Ltd	hiroyasu.nakagawa@furuno.co.jp
KUKKONEN	Antti	Finland	Furuno Finland Oy	antti.kukkonen@furuno.fi
PEIPONEN	Hannu	Finland	Furuno Finland Oy	
GEWIES	Stefan	Germany	German Aerospace Centre - Institute of Communications and Navigation	stefan.gewies@dlr.de

LAZARO BLASCO	Francisco	Germany	German Aerospace Centre - Institute of Communications and Navigation	francisco.lazaroblasco@dlr.de
RAULEFS	Ronald	Germany	German Aerospace Centre - Institute of Communications and Navigation	Ronald.Raulefs@dlr.de
LOPEZ CABECEIRA	Marcos	Spain	GMV Aerospace and Defence S.A.U	malopez@gmv.com
ALKABIR	Mutaz	Turkey	HAVELSAN AS	malkabir@havelsan.com.tr
TURHANGIL	Huseyin Cenk	Turkey	HAVELSAN AS	hturhangil@havelsan.com.tr
BATTY	Ernest	United Kingdom	IMIS Global Ltd	ernie.b@imisglobal.com
MOHD NAZWAN HAFEEZ	Hashim	United Kingdom	IMO	MBinHash@imo.org
YASNIKOUSKI	Javier	United Kingdom	IMO	
HATTORI	Osamu	Japan	Japan Coast Guard	
KATO	Takeharu	Japan	Japan Coast Guard	
NAKAJIMA	Tomoya	Japan	Japan Coast Guard	
NOGUCHI	Hideki	Japan	Japan Coast Guard	hideki.noguchi@gmail.com
YOSHIDA	Koichi	Japan	Japan Coast Guard	
MIYADERA	Yoshio	Japan	Japan Radio Co, Ltd	miyadera.yoshio@jrc.co.jp
TAKAHASHI	Masayuki	Japan	Japan Radio Co, Ltd	takahashi.masayuki@jrc.co.jp
AKAMATSU	Tomonari	Japan	The Sasakawa Peace Foundation	t-akamatsu@spf.or.jp
TOK	Berker Emre	Turkey	Koç Bilgi ve Savunma Teknolojileri A.Ş.	berkeremre.tok@kocsavunma.com.tr
VESTERLUND	Lene	Norway	Kongsberg Norcontrol	lene.vesterlund@knc.kongsberg.com
SCHUETT	Todd	Norway	Kongsberg Norcontrol AS	todd.schuett@kongsberg.com
BJORNEVIK	Anders	Norway	Kongsberg Seatex AS	
KIM	Juntae	Republic of Korea	Korean Register of Shipping	
WON	Jaybee	Republic of Korea	Korean Register of Shipping	jbwon@krs.co.kr

YOO	Jinho	Republic of Korea	Korean Register of Shipping	yoojinho@krs.co.kr
CHO	Deuk Jae	Republic of Korea	KRISO - Korea Research Institute of Ships and Ocean Engineering	djcho@kriso.re.kr
CHOI	HyunSoo	Republic of Korea	KRISO - Korea Research Institute of Ships and Ocean Engineering	troychoi@kriso.re.kr
PARK	Jin Hyoung	Republic of Korea	KRISO - Korea Research Institute of Ships and Ocean Engineering	jin.h.park@kriso.re.kr
SHIM	Woo-seong	Republic of Korea	KRISO - Korea Research Institute of Ships and Ocean Engineering	pianows@kriso.re.kr
FIORINI	Michele	Italy	Leonardo s.p.a. (formerly Selex - Sistemi Integrati)	michele.fiorini@leonardocompany.com
ALBUKHARI	Hairizam	Malaysia	Light Dues Board Peninsular Malaysia Marine Department	
JIANG	Guifu	China (Hong Kong)	Marine Department HKSAR, Hong Kong	gfjiang@mardep.gov.hk
MAGNO	Edson	Brazil	Marinha do Brasil- Diretoria de Hidrografia e Navegação- Centro de Auxílios Navegação	edson.magno@marinha.mil.br
MARINHOS MOURA	Marcos Felipe	Brazil	Marinha do Brasil- Diretoria de Hidrografia e Navegação- Centro de Auxílios Navegação	marinhos.mb@gmail.com
SILVA	Marcos	Brazil	Marinha do Brasil- Diretoria de Hidrografia e Navegação- Centro de Auxílios Navegação	massilvahn@hotmail.com

BIN AHMAD	Muhamma d Kamal	Singapore	Maritime and Port Authority of Singapore	Muhammad_Kamal_Ahmad@mpa.gov.sg
CHAI	Jeffrey	Singapore	Maritime and Port Authority of Singapore	Jeffrey_Chai@mpa.gov.sg
CHONG	Jia Chyuan	Singapore	Maritime and Port Authority of Singapore	Chong_Jia_Chyan@mpa.gov.sg
FOO	Chi Jao	Singapore	Maritime and Port Authority of Singapore	
LEE	Sunny	Singapore	Maritime and Port Authority of Singapore	Sunny_Lee@mpa.gov.sg
ONG	Chin Beng	Singapore	Maritime and Port Authority of Singapore	Ong_Chin_Beng@mpa.gov.sg
ONG	Vincent	Singapore	Maritime and Port Authority of Singapore	Vincent_Ong@mpa.gov.sg
PUI	Eunice	Singapore	Maritime and Port Authority of Singapore	Eunice_Pui@mpa.gov.sg
TEE	Kim Chuan	Singapore	Maritime and Port Authority of Singapore	Tee_kim_chuan@mpa.gov.sg
YEO	Gavin	Singapore	Maritime and Port Authority of Singapore	Gavin_Yeo@mpa.gov.sg
QUINN	Wayne	United Kingdom	Maritime Coastguard Agency	
CARSON- JACKSON	Jillian	United Kingdom	The Nautical Institute	jillian@jcjconsulting.net
LYAZIDI	Safae	Morocco	Ministère de l'Équipement, Transport et Logistique	s.lyazidi@mtpnet.gov.ma
VAN GILS	Jeffrey	Netherland s	Ministry of Infrastructure and Water Management	jeffrey.van.gils@rws.nl
ALEMPIJEVIC	Alen	Croatia	Ministry of the Sea, Transport and Infrastructure	alen.alempijevic@pomorstvo.hr
EGGLESTON	Sarah	USA	National Geospatial- Intelligence Agency	
ASHEIM	Harald	Norway	Norwegian Coastal Administration	harald.aasheim@kystverket.no

LOGE	Lars	Norway	Norwegian Coastal Administration	
CHRISTENSEN	Thomas	Germany	OFFIS EV	thomas@dmc.international
HAHN	Axel	Germany	OFFIS EV	axel.hahn@uol.de
JANKOWSKI	Dennis	Germany	OFFIS EV	-
MØLLER	Julius	Germany	OFFIS EV	
ALQUIZAR	Lyn	Philippines	Philippine Coast Guard Headquarters	lyn.alquizar@coastguard.gov.ph
BASCO	Rex Randolph	Philippines	Philippine Coast Guard Headquarters	rexbasco0307@gmail.com
BIJLSMA	Rodrigue	Belgium	Port of Antwerp	rodrigue.bijlsma@portofantwerp.com
EBBEN	Martijn	Netherlands	Port of Rotterdam Authority	m.ebben@portofrotterdam.com
MOUSAVI MAHVELATI	Mehdi	Iran	Ports and Maritime Organisation	mmousavi@pmo.ir
TRENT	Michael	United States	Radio Technical Commission for Maritime Services (RTCM)	michael.trent@maritechusa.com
FRANCK	Pierre	France	Safran Electronics & Defence	pierre.franck@safrangroup.com
ALJOHANI	Abdulhamid	Saudi Arabia	Saudi Ports Authority	
ALJOHANI	Hattan	Saudi Arabia	Saudi Ports Authority	H.ALALWANI@MAWANI.GOV.SA
ZHANG	Zhe	China	Shanghai Spaceflight Institute of TT&C and Telecommunication	
DEMBOVSKIS	Andis	Luxembourg	Spire Global Luxembourg S.a.r.l	andis.dembovskis@spire.com
KARLSSON	Fredrik	Sweden	Swedish Maritime Administration	fredrik.karlsson@sjofartsverket.se
KITAGAWA	Hiromitsu	Japan	The Sasakawa Peace Foundation	kitasanh@jasmine.ocn.ne.jp
KUDO	Eisuke	Japan	The Sasakawa Peace Foundation	e-kudo@spf.or.jp
MIZUNARI	Takeshi	Japan	The Sasakawa Peace Foundation	t-mizunari@spf.or.jp
TANAKA	Kotaro	Japan	The Sasakawa Peace Foundation	k-tanaka@spf.or.jp
WATANABE	Tadaichi	Japan	The Sasakawa Peace Foundation	tadaichi-watanabe@spf.or.jp
SAFAR	Jan	United Kingdom	Trinity House	jan.safar@gla-rrnav.org

VASTARDIS	Nikolaos	United Kingdom	Trinity House	
NISHIMURA	Koichi	Japan	TST Corporation	knishimura@toyoshingo.co.jp
CAMPBELL	Dearbhla	United Kingdom	UK Hydrographic Office	dearbhla.campbell@ukho.gov.uk
PATTON	Helena	United Kingdom	UK Hydrographic Office	
ADAMS	William	United States	US Coast Guard	william.c.adams@uscg.mil
ARROYO	Jorge	United States	US Coast Guard	jorge.arroyo.uscg@gmail.com
GALLAGHER	Patrick	United States	US Coast Guard	patrick.j.gallagher@uscg.mil
NORSWORTHY	Ross	United States	US Coast Guard	Ross_Norsworthy@msn.com
SCHULTZ	Johnny	United States	US Coast Guard	Johnny.Schultz@Sev1Tech.com
SOININEN	Olli	Finland	Vessel Traffic Services Ltd-Fintraffic	olli.soininen@fintraffic.fi
LEGKIKH	Alexander	Norway	Vissim AS	
ROSTOPSHIN	Dmitry	Ireland	Wartsila (formerly Transas)	
CARD	Michael	Japan	Zeni Lite Buoy Co Ltd	mike.card@btinternet.com

New Members

Name	Country	Member category
Harald Asheim	Norway	National
Helena Patton	UK	Associate
Andis Dembovskis	Luxembourg	Industrial
Berker Emre Tok	Turkey	Industrial
Tanaka Kotaro	Sth Korea	Associate
Kai Yen	Singapore	Associate

ANNEX C LIST OF INPUT PAPERS

All papers are posted on the Committee section of the IALA website

Meeting	Agenda Item	Output Paper Title	Source
ENAV28-	1.2.1	Agenda ENAV28	IALA
ENAV28-	2.1.1	ENAV27 Action Items	IALA
ENAV28-	2.1.2	Report of ENAV27	IALA
ENAV28-	3.1.1	Report Council 73	IALA
ENAV28-	3.4	Report IHO IALA Technical 5th coordination meeting	IALA
ENAV28-	3.5.1	Reply LS to IALA and CIRM on the revision of ITU 1371-5	ITU
ENAV28-	3.5.2	IALA Report of ITU-R WP5B meeting November 2021	Stefan B
ENAV28-	5.0	Input paper Committee meeting template	IALA
ENAV28-	5.0.1	List of input papers	IALA
ENAV28-	5.1.1.1	SMART Navigation in Service in Korean Waters	KRISO
ENAV28-	5.1.1.2	Status on MCP and its role in e-Navigation	MCP
ENAV28-	5.1.1.3	Change Proposal for IALA G1128	GLA, SMA, OFFIS
ENAV28-	5.1.1.4	The analysis of general cybersecurity requirements applicable to ship's e-Nav	Korean Register
ENAV28-	5.1.2.1	Artificial Intelligence, Machine Learning and Deep Learning within the domain of IALA	Ernest Batty
ENAV28-	5.1.2.1.1	AI as a new task for WG2_01	Ernest Batty
ENAV28-	5.1.2.2	Proposal on amendment of Maritime Services (MS) for MASS	China MSA
ENAV28-	5.1.2.3	IMT input IALA IMO ITU EG vs3 3GPP feedbacks ENAV27-12.2.6	WG3
ENAV28-	5.1.2.3.1	LS on IALA contribution on International Mobile Telecommunications in the Maritime Domain	WG3
ENAV28-	5.1.2.4	Candidate Technologies for Review (WG2)	WG2 Chair
ENAV28-	5.1.2.4.1	Orolia Aug2021 Guideline 1153 Ed.1 Template Review emerging technologies	WG2 Chair
ENAV28-	5.1.2.4.2	Orolia Maritime IDM Aug2021	WG2 Chair
ENAV28-	5.1.3.1	Input paper R-mode Authentication	DLR
ENAV28-	5.1.3.2	VDE SAT R-Mode Considerations	GRAD

ENAV28-	5.1.3.3	Proposal of initiating discussion on the VDES resource sharing	OPRI
ENAV28-	5.1.3.4	Proposal for the development of Guideline on AISVDES VDL integrity monitoring	China MSA
ENAV28-	5.2.1	VTS Update - Revision to IMO Resolution A857(20)	VTS
ENAV28-	5.2.1.1	Draft IMO Resolution & Draft Guideline G1089	IMO
ENAV28-	5.2.2	Input paper on the report of IALA WS on MASS	ENAV Chair
ENAV28-	5.2.2.1	Report on the IALA Workshop on marine AtoN in the autonomous world_FINAL (1)	IALA
ENAV28-	5.2.3.0	Standards revision	IALA
ENAV28-	5.2.3.0.1	Structure of the standards	IALA
ENAV28-	5.2.3	Draft revision S1010 AtoN Planning and Service Requirements (for review 2nd half 2021)	IALA
ENAV28-	5.2.4	Draft revision S1020 AtoN Design and Delivery (for review 2nd half 2021)	IALA
ENAV28-	5.2.5	Draft revision S1030 Radionavigation Services (for review 2nd half 2021)	IALA
ENAV28-	5.2.6	Draft revision S1040 Vessel Traffic Services (for review 2nd half 2021)	IALA
ENAV28-	5.2.7	Draft revision S1050 Training and Certification (for review 2nd half 2021)	IALA
ENAV28-	5.2.8	Draft revision S1060 Digital Communication Technologies (for review 2nd half 2021)	IALA
ENAV28-	5.2.9	Draft revision S1070 Information Services (for review 2nd half 2021)	IALA
ENAV28-	5.2.10	Request for updating the Guideline 1107 – Planning and reporting of e-Navigation Testbeds	IALA
ENAV28-	5.2.11	Liaison note to all committees on the final draft revision of MBS R1001 ARM13-11.2.5	ARM
ENAV28-	5.2.11.1	Draft WP The IALA Maritime Buoyage System (ARM13-11.2.5.1)	ARM
ENAV28-	5.2.12	LN to ARM ENAV on Cyber Security	VTS
ENAV28-	5.2.13	The Highlight of Digital at Sea AP 2021	Digital@Sea
ENAV28-	5.2.14	Liaison Note Operations and Trials of Autonomous Ships - 'Case Studies' (VTS51-13.1.1.5)	VTS
ENAV28-	5.2.14.1	WP TG1.2.5 Possible case studies - Operations and Trials of Autonomous Ships VTS51-13.1.1.5	VTS
ENAV28-	5.2.15	Liaison Note Implications of MASS from a VTS Perspective a discussion paper VTS51-13.1.1.6	VTS
ENAV28-	5.2.15.1	WP TG.1.2.5 Discussion paper - Implications of MASS from a VTS perspective 111021 VTS51-13.1.1.6.1	VTS

Output documents are submitted for review/action by a body other than the Committee initiating the document.

Meeting	Agenda Item	Output Paper Title	Source	Action
ENAV28-	12.0.1	Liaison note to ARM on the final draft revision of MBS R1001	ENAV28	ARM
ENAV28-	12.0.2	(ENAV Comment) ENAV28-5.2.11.1 draft WP The IALA MBS	ENAV28	ARM
ENAV28-	12.1.1	Review G1128 Ed1.3 Specification of eNav technical service	WG1	Council
ENAV28-	12.1.2	Liaison note to PAP on proposal of amendment of maritime service for MASS	WG1	PAP
ENAV28-	12.2.1	Liaison note to ARM regarding Ship Reporting Guideline	WG2	ARM / PAP
ENAV28-	12.3.1	WG3 New work items proposal 20211015	WG3	PAP

Working papers will remain within the Committee for further review during ENAV27.

Meeting	Agenda Item	Output Paper Title	Source	Action
ENAV28-	12.0.3	Task list register	ENAV28	ENAV29
ENAV28-	12.1.3	WP Draft Technical service specification for the provisioning of AtoN information to end-users using the S-125 data model	WG1	ENAV29
ENAV28-	12.2.2	WP Review of the passive and active GNSS antenna systems and the Orolia SecureSync and M-SecureSync	WG2	ENAV29
ENAV28-	12.2.3	WP Draft IALA Maritime Communications Manual	WG2	ENAV29
ENAV28-	12.2.3	WP Draft Guideline on Artificial Intelligence and Machine Learning	WG2	ENAV29

Action Items for the Secretariat

1. The **IALA Secretariat** is requested to submit the working paper ENAV28-12.1.3 Draft Technical service specification for the provisioning of AtoN information to end-users using the S-125 data model as an input paper to ENAV29. 18
2. The **IALA Secretariat** is requested to forward the input papers ENAV28-5.1.1.4 and ENAV28-5.2.12 to the IALA cyber security workshop as a resource document. 18
3. The **IALA Secretariat** is requested to forward ENAV28-12.1.2 Liaison Note to PAP: Proposal of remote control and monitoring service as a new Maritime Service (MS) in the context of e-Navigation to PAP. 19
4. The **IALA Secretariat** is requested to submit the Revision of Guideline 1128 on the specification of e-Navigation technical services (ENAV28-12.1.1) to the Council for approval. 19
5. The **IALA Secretariat** is requested to forward the working documents on the review of the passive and active GNSS antenna systems and the Orolia SecureSync and M-SecureSync (ENAV28-12.2.2) to ENAV29. 21
6. The **IALA Secretariat** is requested to forward any input received on developments within other IALA Committees on the internet of things to ENAV29 for further consideration. 21
7. The **IALA Secretariat** is requested to forward the draft IALA Maritime Communications Manual (ENAV28- 12.2.3) to ENAV29. 21
8. The **IALA Secretariat** is requested to continue the liaison with 3GPP and provide an update on the work at the IMO on IMT to ENAV29. 22
9. The **IALA Secretariat** is requested to send the draft IALA liaison to IMO-ITU Expert Group 18 (2022) to 3GPP TSG SA via H. Koo, liaison for 3GPP/IALA. 22
10. The **IALA Secretariat** is requested to advise the IALA MASS Task Group that the IALA G1107 is being revised by ENAV Committee to support a broader approach for test beds related to the digital transformation of the maritime environment. 22
11. The **IALA Secretariat** is requested to forward the liaison note to ARM and PAP regarding Ship Reporting Guideline ENAV28-12.2.1 for further consideration in the work by IALA on Maritime Single Window. 23
12. The **IALA Secretariat** is requested to obtain the ISO/CD 28005-1 document that deals with the MSW and share this with the IALA membership to support coordination of the work on MSW. 23
13. The **IALA Secretariat** is requested to forward the draft Guideline on Artificial Intelligence and Machine Learning within the domain of IALA (ENAV28- 12.2.4) to ENAV29. 23
14. The **IALA Secretariat** is requested to forward proposed new task listed in the IALA Nextcloud folder: ENAV28 WG2/WG2 General/Potential Work Items, as provided in the task proposal templates, to PAP for consideration in the development of the future work programme for IALA Committees in 2023-2027. 23
15. The **IALA Secretariat** is requested to forward the proposed new task listed in the document WG3 New work items proposal 20211015 (ENAV28-12.3.1), to PAP for consideration in the development of the future work programme for IALA Committees in 2023-2027 or to the next ENAV meetings. 25
16. The **IALA Secretariat** is requested to add the “ENAV WG3/IEC TC80 WG15 joint working group intersessional workshop on IALA G1117” to the calendar. 27
17. The **IALA Secretariat** is requested to send the report of ENAV28 (ENAV28-13.1) to the Council to note. 29

Action Items for Participants

18. The **Committee participants** are encouraged to contribute to working paper ENAV28-12.1.3 Draft Technical service specification for the provisioning of AtoN information to end-users using the S-125 data model and to provide input to ENAV29. 18
19. The **Committee participants** are encouraged to participate in the intersessional group working on the development of Draft Technical service specification for the provisioning of AtoN information to end users by means of the S-125 data model and contact Thomas Christensen (thomas@dmc.international) by 29/11/2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard. 18
20. The **Committee participants** are encouraged to provide input papers to ENAV29 regarding technical services that could be used for the implementation of RCMS. 19
21. The **Committee participants** are requested to provide information on candidate technologies for review using the template provided in IALA Guideline 1153. 20
22. The **Committee participants** are encouraged to participate in the intersessional group working on the development of the Maritime Communications Manual and contact Ernie Batty (ernie.b@imisglobal.com) by 12 November 2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard. 21
23. The **Committee Participants** are encouraged to participate in the intersessional group working on the revision of G1107 and contact Jillian Carson-Jackson (jillian@jcjconsulting.net) by 12 November 2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard. 22
24. The **Committee participants** are encouraged to participate in the intersessional group working on the development of the draft Guideline on Artificial Intelligence and Machine Learning within the domain of IALA and contact Ernie Batty (ernie.b@imisglobal.com) by 12 November 2021, noting the dates and times of the intersessional meetings will be published on the IALA ENAV Committee Dashboard. 23
25. The **Committee participants** are requested to share their findings on VDES clarification for potential integration into the Working Document toward PDR 2092-1 during the WG3 virtual intersessional VDES clarification meeting scheduled on 19th November and 13th December at 11.00-14.00 UTC. 25
26. The **Committee participants** are invited to participate in the joint IEC TC80 WG15 and IALA ENAV WG3 Intersessional meeting in the Netherlands from 10th of January 2022 at 08:00 UTC to the 14th of January 2022, 11:00 UTC. 27
27. The **Committee participants** are requested to review and propose changes to the IALA Guideline on VDES R-mode G1158 for the next ENAV29 committee meeting or discuss issues with Ronald Raulefs (ronald.raulefs@dlr.de) at any time. 28
28. The **Committee participants** are requested to ask for a new work item at IMO MSC level to task NCSR with the creation of an IMO performance standard on VDES R-mode. Please coordinate with Ronald Raulefs. 28



10, rue des Gaudines – 78100 Saint Germain en Laye, France
Tel. +33 (0) 1 34 51 70 01 – Fax +33 (0) 1 34 51 82 05 – contact@iala-aism.org
www.iala-aism.org

International Association of Marine Aids to Navigation and Lighthouse Authorities
Association Internationale de Signalisation Maritime