REPORT OF THE FIRST SESSION OF THE DIGITAL TECHNOLOGIES (DTEC) COMMITTEE

25th September to 5th October 2023

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Report of the first session of the IALA Digital technologies committee

Executive Summary

During the 30th session of the ENAV Committee, the suggestion to alter its title from 'e-Navigation information services and communications' (ENAV) to the 'Digital technologies' (DTEC) committee. This shift aimed to encompass a wider scope of emerging technologies, including autonomous systems, cybersecurity, among others.

The first session of the Digital technologies committee was held from 25 September to 5 October 2023, chaired by Hideki Noguchi and vice-chaired by Jorge Arroyo. The technical officer for the meeting was Jaime Alvarez.

There were 114 registered participants, 32 for the first time, from 26 countries and 5 sister organisations.

This was the first meeting for the 2023-2027 Work Programme and the Committee considered 40 input papers and produced 9 output papers.

Key highlights:

- The DTEC Committee concluded the draft Guideline on VDES VDL Integrity monitoring (DTEC1-12.3.3.1) aiming at:
    - providing guidance for stakeholders, ship and shore, and competent authorities in protecting VDES from risks to its integrity
    - providing an overview of the source of VDES VDL vulnerability, and;
    - proposing methods for IALA members to detect and mitigate the effects of invalid VDL transmissions;
- In regards with the above mentioned draft Guideline on VDES VDL Integrity monitoring (DTEC1-12.3.3.1), the DTEC Committee concluded a liaison note to IMO NCSR NCSR subcommittee inviting to consider:
    (a) the IALA guideline on VDES VDL Integrity Monitoring ,
    (b) the identified risks in the Guideline against the IMO security and integrity requirements,
    (c) the recommended proposed approach identified in the Guideline:
- the DTEC Committee concluded a liaison note on the Progress on Cyber Security guideline (DTEC1-12.3.1.1.) to ENG and ARM Committees explaining that during DTEC1 he document was reviewed and additional content was created in chapters 4 and 5. Also the structure of chapter 7 was changed to correspond with the overall structure. It is requested that ENG and ARM review the changes. The LN was enclosed with the Annex to the draft Guideline: DTEC1-12.3.1.1.1 Draft Guideline on Cyber Security - Post DTEC1
- the DTEC Committee concluded a liaison note on VTS Digital Services Architecture Development (DTEC1-12.3.1.2) to VTS, a number of remarks were proposed to VTS Committee in conjunction with the updated drawing - which would be the technical architecture view in the document.
- the DTEC Committee concluded a liaison note on Technology review MS@MS (DTEC1-12.3.2.1) to ARM and ENG proposing new technologies that may be of interest to the members of IALA. DTEC reviewed a radio-free wireless communication based on Metal Surface Wave technology (MS@MS) and created the technology assessment table (DTEC1-12.3.2.1.2). DTEC1 invites ENG and ARM to:
    - consider the attached emerging technology assessment and additional document available;

    - if considered suitable, invite IALA members to implement MS@MS technology trials to verify the practical application of the technology;
    - Encourage members to present results of trials using the revised IALA G1107 Planning and Reporting of Testbeds in the Maritime Domain Ed 3.0.
- The DTEC Committee concluded a liaison note on Developments on the Maritime Internet of Things (DTEC1-12.3.2.2) to ARM and ENG and invite to
    - note the work carried out by ENAV during the 2018-2023 work programme on Maritime IoT, specifically the publication of G1179
    - take into consideration the discussion points from DTEC 01

Planned intersessional work before DTEC2:

- MCP Specifications: Intersessional meetings will be held on November 8th, November 10th 2023 and February 1st 2024, all 12:00-14:00 UTC. The meeting in February is proposed to be hybrid, to be held in Copenhagen back-to-back with Digital@Sea. DLR and AIVeNautics voulenteered to organise the venue
- MARCOM: In order to complete this document at DTEC2, it is proposed that two intersessional meetings be arranged so that the MARCOM manual is ready for completion at DTEC2. The first intersessional meeting will be held: 2 November 2023 from 0900-1000 UTC
- Develop Guideline on use cases over IMT-2030: The proposed dates for the intersessional meetings, which will be advised on the IALA Dashboard, are - 1 November 2023 0900-1030 UTC / 20 December 2023 (time to be confirmed) / 6 February 2024 (time to be confirmed)
- Document on skills related to the digital environment: dates are to be confirmed and will be published in the dashboard.

Contents

Report of the first session of the IALA Digital technologies (DTEC) Committee

GENERAL

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1. INTRODUCTION

1.1 Welcome from the Secretary-General

The Secretary-General, Francis Zachariae, welcomed all participants on-site and on line and was glad to see them during the DTEC 1 session which is the first meeting of the new committee and in the new work period after a very successful Conference and General Assembly in Rio de Janeiro in May - June 2023.

The Secretary-General recalled the excellent outcome and program during the Conference and expressed his gratitude to the National member of Brazil for the hard work they have done and Industry who made a fantastic exhibition and evening party at the Golf club. Francis Zachariae took the opportunity to announce the next Conference is scheduled in 2027 in India. The highlights from the Conference were addressed and available as input for DTEC1.

The Secretary-General, noticed with special interest the input papers on MASS which was also the case for the VTS56 Committee and identified the key role of communications for the development of such technology. It was also noted the number of inputs on VDES and the relevant outcomes and knowledge provided during the Digital communications workshop in Japan (February 2023). The role of the Maritime Connectivity Platform in this sense gives a lot to the maritime community. It was also noted the current proliferation of

MASS – level 1 and 2. IALA keep an outstanding role to provide guidance to competent authorities and IALA members in general on MASS as the next workshop (October 2023) with important stake holders from users (ICS and BIMCO) and IMPA, shipbuilders like Hyundai, authorities and other industry to make possible scenario on why invest in MASS, types of ships from 5-20 years from now.

The Secretary-General, addressed the process of transforming IALA to an Intergovernmental Organization with a current status of 25 ratifications made by the parliaments of the different states. When 30 States have ratified, accepted or acceded to the Convention, IALA will be an IGO. That could happen on 2023 or early 2024. Francis Zachariae ensured that the Secretariat is working on all the new structures and administrative issues that need to be in place for the new Organization, and thanked Singapore because of its offer to host the first General Assembly of the new IGO.

The Secretary-General wished all the participants good luck and thanked them once again for their contribution to the IALA family over this new busy period.

1.2 Approval of the agenda

The agenda (DTEC1-1.2.1) was reviewed and adopted.

1.3 Introductions and apologies

The Chair welcomed all participants, both in-person and online, 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.

1.5 Style Guide

The Secretary recalled the released IALA Style Guide designed to assist those members in preparing and reviewing IALA documentation.

2. REVIEW OF ACTION ITEMS FROM ENAV EM1 (DTEC1-2.1.1)

2.1 Action Items – IALA Secretariat

All actions items from EM1 were covered before the present meeting.

2.2 Action Items – ENAV Committee Participants

The Chair reviewed the progress of the action items with no further comment.

3. REPORTS FROM OTHER BODIES

3.1 IALA

3.1.1 20th IALA Conference

Minsu Jeon, IALA Technical Manager, informed participants that the IALA Conference provided a remarkable platform for delving into a wide array of presentations encompassing various technical aspects within IALA's scope. Over the course of this event, approximately 140 presentations were delivered, spanning both plenary sessions and the speaker's corner, and all of these presentations can be accessed via the file-sharing platform. This opportunity proved invaluable for staying abreast of ongoing technical advancements and gaining insights into forthcoming developments.

Upon examining the conclusions drawn from the conference, some trends were prominently discussed, with a notable focus on sustainability, in alignment with the United Nations Sustainable Development Goals (SDGs). The cooperative relationship between the International Hydrographic Organization (IHO) and IALA was emphasized as well.

A considerable number of presentations delved into the realm of autonomy and the human dimension, a topic magnified by the influence of digitalization in the maritime field. The Conference also highlighted that it is equally crucial not to lose sight of the importance of physical Aids to Navigation (AtoN) for mariners.

The input documents DTEC1-3.1.1.1 IALA Conference summary and the DTEC1-3.1.1 Report 20th IALA Conference 2023 reference the outcomes of the 20th IALA Conference in Rio de Janeiro – May 2023. The conveyed conclusions were:

- **Sustainability** and its link to the **UN SDGs** is of increasing importance and IALA is duty bound to raise the profile of this area in the committees. Members should continue to **innovate sustainable approaches** by recognizing, developing and reviewing the whole lifecycle of AtoN services.
- To achieve **digital transformation** in the S-100 domain, the importance of **collaboration and continued dialogue between IHO, IALA** and other domain controllers is necessary. IALA should stand ready to assist coastal authorities with their transition to S-100 related products.
- **Autonomy** is a driver to leverage the development of digital products. AtoN has a role in support of autonomous vessels and technology needs to be standardized to meet the future requirements of all vessels.
- VTS technology needs to take into account **human factors with increased digitalization**, including **AI in VTS**.
- IALA acknowledges that **virtual tools** and the **use of e-learning** contributes to flexible, efficient and sustainable training. In addition, IALA recognizes its role in promoting the use of language testing tools to improve the communication capabilities of VTS operators.
- **Physical AtoN remains important to the mariner**. IALA members should continue to pursue **emerging technologies and approaches** such as big data analytics, Internet of Things (IoT), machine vision technology and drones to make their services more effective and meet the future needs of the mariner.

3.1.2 General Assembly

The General Assembly took place the third of June 2023 in Rio de Janeiro, Brazil. The main oucomes of the GA were:

- Approval of amendments to the constitution and adopted the associated Resolution A14-01
- Approval of the Standards Ed 2.0
- Approval of the MBS Ed2.0
- Approval of the Strategic vision
- Consideration of proposals received from members
- Election of the council - as a result of these votes the following National members were elected:
    - Australia: Australian Maritime Safety Authority (54)

- Canada: Canadian Coast Guard (56)
- Chile: Directorate General of the Maritime Territory and Merchant Marine (Directemar) (48)
- Denmark: Danish Maritime Authority (52)
- Finland: Finnish Transport Agency (47)
- Germany: Federal Waterways and Shipping Agency (49)
- Ireland: Commissioners of Irish Lights (41)
- Italy: Italian Coast Guard (54)
- Japan: Japan Coast Guard (60)
- Malaysia: Light Dues Board, Peninsular Malaysia (53)
- Morocco: Direction des ports et du Domaine public maritime (53)
- Norway: Norwegian Coastal Administration (52)
- People's Republic of China: Maritime Safety Administration (48)
- Republic of Korea: Ministry of Oceans and Fisheries (58)
- Singapore: Maritime and Port Authority (60)
- Spain: Puertos del Estado (57)
- Sweden: Swedish Maritime Administration (51)
- The Netherlands: Ministry of Infrastructure and the Environment, Directorate of Maritime Affairs (51)
- Türkiye: Directorate General of Coastal Safety (52)
- United Kingdom: Trinity House (51)
- USA: US Coast Guard (48)

3.1.3 IALA Council

Minsu Jeon, provided the committee with the report of Council 76 (DTEC-3.1.1 Final Report Council 77 and 78), which were held in May and June 2023 in Rio de Jaineiro (Brazil). The following points are relevant to note for the DTEC Committee:

Council 77 convened on May 28 this year in Brazil, during this session, the group made note of the report from PAP49 and an extraordinary session of the ENAV committee.

Finally, the 78th session of the Council was held on June 3 in the same location, with newly elected councillors participating. This session marked the approval of the committee structure for the work period spanning from 2023 to 2027. A significant change involved the renaming of the ENAV Committee to the DTEC Committee. The Council also endorsed the appointment of new chairs for the ENG and ARM committees, along with a new vice-chair for the ARM committee, as well as re-appointing chairs and vice-chairs for VTS and ENAV committees and vice-chair for ENG Committee.

3.1.4 IALA Policy Advisory Panel

Minsu Jeon, reported that the 50th session of PAP was held between 6 - 8 September 2023.

The PAP agreed to the adoption of an online work programme database. This database will be helpful in the management of tasks assigned to the various committees. It promises to streamline committee operations and enhance efficiency within the organization.

The PAP also considered the draft new terms of reference for the committees and subsidiary bodies in the newly established intergovernmental organization (IGO).

Furthermore, discussion considered establishing a liaison with the International Civil Aviation Organization (ICAO) regarding the marking of seaplane operational areas. This liaison aims to foster collaboration and ensure the smooth functioning of seaplane operations in alignment with international standards.

The PAP session provided valuable updates on IALA's involvement in the ongoing Standards of Training, Certification, and Watchkeeping (STCW) review, the review of the Automatic Identification System (AIS) documents, developments related to S-200, and progress with MRN.

Next PAP 51 will be held the 6 to 8 February 2024 in the IALA HQ.

3.1.5 World Wide Academy

Omar Fritz Erkison, Dean of the Academy provided a summary of the objectives of the WWA (based on the second goal of IALA) and the just passed activities and short term commitments with the competent authorities for the provision of Marine AtoN and VTS in terms of training and capacity building. He highlighted the importance of finalizing the cooperation with such competent authorities by engaging them for future activities in IALA and the WWA. The different courses built and provided by the WWA were also identified and the schedule presented. It was also noted that the Academy is ready to act when an eventuality (as a war or any other issue occur) in order to help the IALA national member. The Academy is an independent entity in IALA so that is independently founded, income from IALA member are always very welcome.

3.2 Digital@Sea

Minsu Jeon reported that Digital@Sea Asia Pacific took place in Korea which included a capacity building workshop. This event attracted a substantial pool of expertise in the maritime domain.

Looking ahead, the next conference, Digital@Sea International, is scheduled for 30 – 31 January 2024, in Copenhagen, Denmark. Subsequently, another conference in North America is planned for 8 – 9 May 2024, in Atlantic Beach, Florida, USA.

3.3 IMO

Hideki Noguchi provided a summary of milestones reached during the recent IMO meetings – The input paper DTEC1-3.3 IALA report on IMO NCSR10 refers to NCSR relevant discussions for IALA:

- IALA has submitted five papers on different topics as maritime resource names, Maritime Services descriptions, Auditor's Manual for the IMO Member State Audit Scheme, Guideline G1117 on VDES) Overview and the past workshop on Digital maritime communication.
- Related to the Maritime Services, IALA proposed the update and new descriptions on Maritime Services for VTS and Aids to Navigation. This submission was approved without any changes. As an outcome, VTS 1, 2, and 3 have been consolidated into a singular description on VTS under MS1. The updated AtoN description is now the second point on the list of the descriptions (MS2).
- NCSR also approved a revision of resolution MSC.530(106) on Performance standards for ECDIS that introduces new ECDIS functionalities for a standardized digital exchange of ships' route plans between ships and shore. This approval may signify an opening step, potentially paving the way for broader data exchanges between ECDIS systems and coastal States.
- NCSR10 considered the development of amendments to SOLAS IV and V and performance standards on VDES as instructed by MSC 103
- Considering the revision of Recommendation ITU-R M.1371-5, the tasks on navigational Status (mainly editorials), inclusion of MAtoNs in AIS Message 21, a new single slot AIS AtoN message and a text message for AIS SART, MOB and EPIRB when manually deactivated was agreed.
- The provision of the NAVDAT service by coast stations would be optional and the existing system (i.e. NAVTEX) and the new proposed system (i.e. NAVDAT) were expected to co-exist for a long time. The draft performance standards on NAVDAT should be re-considered at NCSR 11 based on the outcome of WRC-23

- Some concerns were expressed in regards with the vailability of radio equipment in compliance with the revised performance standards set out in resolutions MSC.511(105) and MSC.512(10), which are now delayed to 1 January 2028.
- NCSR10 discussed the issue of unlawful practices associated with the fraudulent registration and registries of ships, including manipulation of AIS data transmissions and tampering of AIS transponders
- Generic performance standards for shipborne satellite navigation system receiver equipment seeking for integrating performance standards of all existing recognized satellite-based radionavigation systems. Expected completion year of this output was defer to 2024.

In addition, Hideki Noguchi oraly reported that MSC 107 agreed to include the new work item of the development of dual-frequency multi-constallation (DFMC) SBAS and advanced RAIM (A-RAIM) reciver performance standards proposed by co-sponsers including IALA into the IMO work plan.

3.4 IHO

Minsu Jeon, reported that regarding International Hydrographic Organization (IHO) matters, IALA continues to be actively engaged in several initiatives. IALA is active in IHO Hydrographic Services and Standards Committee (HSSC) meetings and additionally, the World-Wide Academy (WWA) has joined regional hydrographic Commission meetings, demonstrating a cooperative approach to regional discussions.

A second joint workshop between IHO and IALA has been scheduled for next year and IALA is poised to resume its regular technical cooperation meetings with the IHO later in the current year.

3.5 ITU

3.5.1 ITU-R WP5B

Stefan Bober, IALA representative in ITU-R Working Party 5B (WP 5B) - Maritime mobile service including Global Maritime Distress and Safety System (GMDSS); aeronautical mobile service and radiodetermination service reported the status of relevant discussions for IALA during the meetings from 10th to 21st July 2023 in Geneva.

The full report is available under the reference DTEC1-3.5 IALA Report on ITU-R WP5B meeting 10 to 21 July 2023. The following points resume the report:

- Revision of Recommendation ITU-R M.1371-5 (Automatic Identification System - AIS), IMO agreed with (competition of the review of Recommendation ITU-R M.1371-5 is not expected before end of 2024):
    - Changes in Navigational Status description
    - Introduction of MAtoN in AIS Message 21 Aids to navigation Report
    - a new Single Slot AtoN Report in general but leave the technical solution to ITU
    - clarification of safety related text messages for AIS-SART, MOB_AIS and EPIRB-AIS
    - VDES capability indicator need further consideration by IMO
- Revision of Recommendation ITU-R M.493-15 and ITU-R M.541-10 (Digital selective-calling DSC): some modifications of the recommendation were addressed.
- New report on digital voice communication in the VHF maritime band to investigate the possible expansion of the number of VHF maritime voice channels based on the introduction of digital technology, reliability, GMDSS, mode of operation (simplex/duplex), bandwidth, range, etc.
- New report on the impact of the possible introduction of a R-Mode on the VDES including the need for an Alternative Positioning Navigation and Timing system, identification of spectrum and timing requirements, a technical description of VDES R-Mode, interoperability and resource sharing of VDES R-Mode and VDES Communication Services and Testing, demonstrations and measurements.

- A new ITU study question was raised on the coexistence of VHF data exchange system with a Ranging-Mode in the VHF data exchange system: what technical conditions are necessary for a radio navigation application to ensure their coexistence (R-Mode in the VDES) when using a common frequency band or adjacent frequency bands with VDES.
- New ITU study question “Introduction of Digital Voice Communications in the VHF maritime frequency channels”
- These and other topics are further explained in the input paper DTEC1-3.5.

3.6 IEC

Stefan Bobber informed about the progress on IEC TC80 WP15 responsible for AIS and VDES. The group is assigned to produce test standards for VDES mobile stations within the next two years. The standar should be published in 2026. First VDES standards for mobile units and shore infrastructure / base stations needed shortly after the previous one. IALA also attended represented by Stafn Bobber to the management meeting of all groups of TC80. IALA reported the progress on WG15. Also the work IALA/IEC respect the test standards.

Jorge Arroyo, DTEC committee vice chair, reported on the status of the new ECDIS standard to implement S100 product specifications. Other activities on DSC and track control systems are also followed up by Jorge Arroyo.

3.7 ISO

Jin H Park provided a summary of action in ISO that are related with DTEC scope of work. ISO has several subcommittees and working groups related to the maritime sectors. IALA is currently following activities of such committees and working groups.

Among them, the committee most related to IALA DTEC is the ISO/IEC JTC1 SC41 IoT and Digital Twin Sub-committee, which operates jointly with IEC. In particular, the WG7 of the SC41, where I serve as the convener, is focused on Maritime, underwater IoT and digital twin applications.

It was reported the latest situations of the WG7 as the representative situations of ISO's maritime sector. The most notable change in ISO/IEC JTC1 SC41 WG7 is that the scope of projects, which have been limited to underwater communication technologies so far, is planned to expand to the Maritime IoT and digital twin application fields.

In particular, at the plenary meeting of the SC41 held in Boston last June 2023, a Norwegian representative proposed a preliminary new work item for establishing standards for digital maritime services that introduced Maritime IoT and digital twin concepts, and received support from all delegations.

Additionally, SC41 recommended that the WG7 convener prepare a new roadmap focusing on Maritime IoT and digital twin applications. Considering these circumstances, many projects are expected to be created in the WG7 to develop ISO/IEC standards related to the DTEC committee. In this regards, there will be many opportunities to reflect contents of IALA's guideline in the ISO/IEC standards. There will be opportunities to create ISO/IEC standards that could serve as implementation tools for IALA standards. Jin H Park believes that harmonizing the standardization activities of IALA and ISO will greatly contribute to strengthening the technological capabilities of the maritime sector.

3.8 RTCM

Jorge Arroyo continued with the update on RTCM, D@S North America will be hosted by RTCM followed by the RTCM assembly – first week of May 2024 in Atlantic City (Jacksonville).

A number of special committees impacts in DTEC committee:

- SC121 Guideline for ASM (Application specific messages) is expected to be published by the end of the year. Work on developing standard AMRD Group B, to be submitted to IEC. Mobile AtoNs are as well of interest for ENAV.

- SC 131 on Multi-System Shipborne Navigation Receivers: standardised SBAS messages to provide integrity and DGNSS corrections into the receiver.
- SC 134 on Integrity for High Accuracy GNSS-Based Applications
- SC 135 Radio Layer for Real-Time DGNSS Applications
- SC137 on Electromagnetic Interference between LED lights with VHF and AIS to work with IEC
- SC138 on R-Mode will be soon working again
- SC101 working on class revision on class B VHF radio standard

3.9 3GPP

Hyounhee Koo (SyncTechno Inc. / 3GPP representative) provided an update on standardization within 3GPP and ITU-R WP5D, particularly concerning Release 19 and the forthcoming IMT-2030. She mentioned that the maritime perspective on the prioritization of content for Release 19 was formulated through collaborative efforts with IALA Secretariat and was presented at 3GPP TSG SA workshop on Release 19 content prioritization in June 2023 with two representative examples of digitalization for VTS and autonomous ships, while maintaining alignment with the maritime requirements that were previously developed for Release 18 content prioritization.
Hyounhee Koo highlighted the draft new report ITU-R M.[IMT.APPLICATIONS] on use cases for IMT-2020 and beyond technologies across various industries, including maritime usage scenarios. The report has been submitted for approval to ITU-R SG5 held in the same week of IALA DTEC#01 meeting.
Hyounhee Koo also provided the standardization status for Release 19 including its timeline and the prioritization of Release 19 contents scheduled to be decided in December 2023. She emphasized that this standardization effort aims to continuously enhance 5G-Advanced capabilities while preparing for upcoming standardization for IMT-2030.
She also presented the consensus reached in ITU-R WP5D regarding the IMT-2030 framework. This framework comprises six usage scenarios, which encompass ubiquitous connectivity and integrated sensing and communication. Additionally, it includes four overarching goals, one of which is connecting the unconnected. These aspects are expected to play a significant role in shaping the development of enabling technologies for IMT-2030 within 3GPP in a way more optimized for the maritime sector.
In addition, Hyounhee Koo pointed out that the standardization process for IMT-2030 is approaching within 3GPP. Discussions are expected to commence in 3GPP SA WG1 starting at the end of this year, with Release 20 expected to serve as the inaugural specification release for IMT-2030.
Finally, Hyounhee Koo mentioned a proposal for a new task related to future VTS over IMT-2030, to be discussed within WG2, inviting interested parties to attend for further discussion.

3.10 VDES Alliance

Stefan Pielmeier, WG3 chair addressed the purpose of the VDES Alliance working on the interoperability of VDES. Industrials and manufacturers are putting together their equipment to work together and reach the interoperability of those.

4. PRESENTATIONS

Below presentations were provided during the Opening Plenary and the links are available in the dashboard:

4.1 Maritime Connectivity Platform - Axel Hahn (DLR)

Axel Hahn presented the challenge of digital platforms and considered the provision of reliable maritime services. He highlighted the importance and the time expend for ship owners and ship operators to retrieve all the MSI from the navareas and other MSI providers to the Captain. Axel explained the work done in the MCP: channels, data providers, guidelines enabling the digital platforms to exchange information and make use of it on a resilient, secure and reliable basis. Service security, service discoberability are keys for the

performance of the digital platforms. It was also addressed the service architecture, structure and roles of the different parties.

4.2 AIS monitoring – Wim van Hoek (Netherlands)

In recent years, the maritime and communication landscapes have witnessed significant transformations. The presentation aims to provide an overview of these changes and the consequent impact on communication technologies in the shipping industry.

Over the past ten years, AIS technology has emerged as a critical element in maritime communication systems. Recognizing the importance of AIS, we delved deeper into its complexities, aided by extensive references from authoritative sources such as the ITU, IALA, AIVDM protocol, and more.

The motivation to delve deeper into AIS technology was driven by feedback from port and waterway authorities, both for maritime and inland waterways, who expressed concerns about the system's performance. An example that epitomizes these issues was brought forth by the Port of Rotterdam. They reported a critical shortfall in receiving ships' names. This deficiency was attributed to the fact that sending 'message 5', which contained this vital information, required two time slots. However, due to the heavy VDL (VHF Data Link) traffic load, these time slots were often unavailable, rendering the transmission of 'message 5' infeasible.

To address these challenges, regular interactions with AIS equipment manufacturers and dealers became a key part of our process. These exchanges allowed us to share our insights and experiences, fostering a collective effort to enhance the AIS product.

Johan Griffioen developed a unique AIS receiver equipped with advanced software and an AIS-direction finder capable of locating stations. The analysis revealed that a typical AIS broadcast lasted for approximately 26 milliseconds. However, interference from transmissions without a clear identity consumed about 6 milliseconds of the available time.

The journey involved an in-depth study of AIS literature and the AIS network, contributing to our ever-expanding understanding of the system. We further explored the radio spectrum in the time domain, leading to the discovery of surprising patterns and intricacies within the technology. Additionally, we identified and reported several issues in transponders and base stations.

The team is working on following subjects:

- AIS-dashboard Dutch Authority Digital Infrastructure (SLIDE 1);
- Home-made AIS-receiver (SLIDE 2);
- AIS-signals in Time domain with a scope, including interferences (SLIDE 3);
- Visibility of several AIS-messages projected on google earth (SLIDE 4);
- Bearing of AIS-signals (SLIDE 5);
- Interfering messages and bearing of its (SLIDE 6);

4.3 Australia's progression with VDES Trials and S-124 developments - Rick Withers (AMSA)

Rick Withers presented the Australian developments on VDES and S-124 testbed. The presentation will provide insight into the technical structure of the testbed, the process for navigation warning data extraction, and S124 data generation methodology. A video demonstration provided accurately the service capability of such developments.

4.4 Singapore's Integrated Port Operations Command & Control Centre (IPOC) system concepts & developments - Dennis Khoo (Singapore MPA)

Dennis share insights on the current developments of Singapore regarding the Integrated Port Operations C3 (IPOC) system aiming at enhancing Singapore's capabilities in incident management and safety enforcement. Singapore's IPOC transforms safety enforcement works and optimises efficiency through leveraging on

various digital technologies such as data analytics , machine learning, artificial intelligence and automation. Singapore aspires towards a more digitally-enabled shipping & maritime community.

4.5 VDES Application Service Platform (VASP) - Hans Haugli (Space Norway)

In the ESA VASP project, a Norwegian consortium and EMSA have successfully tested and demonstrated the following three eNav services using the NorSat-2 VDES satellite:

- S411 ice chart broadcasting
- SAR concept with distribution of vessel search patterns and searched positions reporting
- Mandatory Reporting Service using EMSA infrastructure

IALA members are invited to get in touch if interested in testing of eNav services using satellite VDES.

4.6 Digitalisation activities and solutions - Jin H Park (AIVeNautics)

Jin H park, vice chair of DTEC WG1, presented the activities of the company he represents (AIVeNautics). Due to his background on project manager of the SMART project from Republic of Korea, he is available to advise on a large range of digital solutions to government an private companies.

4.7 Presentations during the working period

The following presentations will be held during the WG2 sessions and are available through this link.

4.7.1 Reutech - Anthony Green

4.7.2 MarineLabs - Scott Beatty

4.7.3 Harmonized IoT for Marine Lanterns - Jonas Lindberg (Finland)

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's attention.

6. ESTABLISH WORKING GROUPS AND TASK GROUPS

The Chair invited all Working Group Chairs to introduce the work planned for Extraordinary meeting 1 (31).

Working Group (WG)	Working Group Chair / Vice Chair
WG1 – Digital Information System	Axel Hahn / Jin H Park
WG2 – Emerging Digital Technology	Jillian Carson-Jackson / Woo-seong Shim
WG3 – Digital Communication System	Stefan Pielmeier / Stefan Bober

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

7.1 Synopsis of the session

In the 1st session of the DTEC committee, the WG1 – Digital Information System worked on several tasks regarding cyber security, Digital Platforms / Marime Connectivity Platform, Maritime Resource Names, G1128 and the VTS Services Specification.

7.2 Introduction Review of Work Plan

Referencing Documents: DTEC-1 3.1.5 Work programme 2023-2027 IALA committee work programme 2023-2027

The actual workplan as introduced by this document was reviewed. The WG continued the following acitivties assigned to the WG. from the Workplan:

- Develop Guidance on Risk Assessment and Certification Methods in the context of e-Navigation
- Develop guidance on cyber security for Marine AtoN
- Guideline for Risk Assessment and Cyber Security
- Review G1114 A Technical Specification for the Common Shore-based System Architecture (CSSA)
- Consider developing a Recommendation for digital platforms
- Review G1128 Specification of e-Navigation technical services
- Contribute to the standardization efforts with respect of the requirements of the S-100 domain experts.
- Coordinate Committee support and submissions for IALA representation at IHO working groups in cooperation with Secretariat (HSSC, S-100WG, NIPWG)

The WG1 set up the work program for the week as reported in the following subchapters.

7.3 TG on Maritime Connectivity Platform Specifications

Task Group Leader: Thomas Christensen

Referencing Document(s):

DTEC1-5.1.1.1 Introducing Maritime Connectivity Platform specifications.docx

The submitters of the document produced a body of work on the specification of a digital platform technology named Maritime Connectivity Platform. Technical presentation about the concepts of the MCP. The WG reviewed the document and discussed the right form of output (standard, recommendation or guideline) and the method of work. The WG decided to work informally on the progress and further development.

A number specific proposals on the detailed specifications was discussed - and several participants agreed to provide input for this for the next DTEC meeting.

The overall plan would be to propose an update to R1019 'Provision of Maritime Services in the context of e-Navigation in the domain of IALA' - to make reference to one or more documents describing MCP.

Intersessional meetings will be held on November 8th, November 10th 2023 and February 1st 2024, all 12:00-14:00 UTC. The meeting in February is proposed to be hybrid, to be held in Copenhagen back-to-back with Digital@Sea. DLR and AIVeNautics voulenteered to organise the venue.

Output Documents:

WP DTEC1- 12.3.1.3 Maritime Connectivity Platform specifications.

Actions Requested:

*The **Secretariat** is requested to forward the working paper DTEC1- 12.3.1.3 Maritime Connectivity Platform specifications to DTEC2 as an input document.*

*The **Secretariat** is requested to publish in the IALA website invite for the intersessional meeting on Maritime Connectivity Platform Specifications to be held in November 8th, 2024 and Jan 31st, 2024, both 12:00-14:00 UTC.*

***That Committee participants** are invited to join the intersessional meeting and indicate their interest to Thomas Christensen (thomas@dmc.international) one week prior to the meeting,*

*The **DTEC Chair** is requested to send a request for a hybrid meeting on Maritime Connectivity Platform Specifications to Secretary General to be held in Copenhagen back-to-back with Digital@Sea in February 2024.*

7.4 Activity on Cyber Security

Activity Leader: Martijn Ebben

Referencing Document(s):

DTEC1-5.0.4 LN to DTEC/ARM on Cyber Security Guideline

DTEC1-5.0.4.1 Draft Cyber security guideline

WG 1 reviewed the draft Cyber Security guideline and has provided content on chapters 4 (ATON) and 5 (Maritime Services in the context of E-navigation). Comments from WG 3 have also been processed and the working group has provided comments and suggested changes to all other chapters, which should be reviewed by the ENG committee and sent to the ARM committee. This may require the output from ENG to be sent as late input paper to ARM as these committee meetings are in consecutive weeks.

Output Documents:

DTEC1-12.3.1.1 LN to ARM/ENG on Cyber Security Guideline

DTEC1-12.3.1.1.1 Amended draft Cyber Security guideline (attachment of the LN)

Actions requested:

*The **Secretariat** is requested to forward liaison note (DTEC1-12.3.1.1) and the annex (DTEC1-12.3.1.1.1) to ENG and ARM on the draftCyber Security Guideline.*

7.5 Activity on ASM

Task Group Leader: Jin Hyoung Park

Referencing Document(s): DTEC1-5.1.3.9 Proposal on the work for the implementation of the Application Specific Messages (ASM), DTEC1-5.1.3.9.1 ASM proposal attachment

WG1 and WG3 held a joint meeting to discuss on the proposal. Need and feasibility of the work were discussed in depth. It was concluded that more detailed proposal on the work is required for the committee to decide whether to start the proposed work.

Actions requested:

*That **Japan Coast Guard** is requested to submit a revised proposal on Activity on ASM reflecting opinions collected during the joint meeting between DTEC WG1 and WG3.*

7.6 TG on Technical Service Specification for VTS

Task Group Leader: Thomas Christensen, VTS

Referencing Document(s): DTEC1-5.0.4 LN on Digital Services Architecture

Work conducted in VTS was presented which comprised a first version of a techical service for VTS (traffic clearance service) and a generic roadmap for developing technical service specifications for VTS. The roadmap described the stages for developing service specification, data-model and service design (following G1128). The roadmap also proposed a versioning scheme for technical service specifications similar to the one used by IHO for product specifications, in which version 1 would be a final draft which would need testing / validation, after which the specification could be adopted in version 2, meaning it would be ready for implementation in production systems.

The liaison note from VTS was discussed - and a liaison note in response to VTS was created.

Output Documents:

DTEC1-12.3.1.2 LN to VTS on Digital Service Architecture

Actions requested:

*The **Secretariat** is requested to forward the DTEC1-12.3.1.2 liaison note to VTS on Digital Service Architecture.*

7.7 TG on G1128

Task Group Leader: Thomas Christensen

Referencing Document(s): **DTEC-5.2.4 EM1-12.2.1.1 Working Document on Revision of IALA G1128**

The WG went through a proposed update of the G1128 and a proposed new concept of a service design template - exemplified with a template for a service design following the SECOM standard.

The draft documents will be used in practice in describing technical services for VTS (VTS committee) and AtoN data provisioning (ARM committee). This work will give feedback to the proccess of this task group in updating the G1128, and introducing the new concept of service design template.

This has an impact on IALA's name space within MRN, which currently have types for service specifications, service designs and service instances, in that a type for service design templates should be included.

Both the draft G1128 update document and the draft service design template for SECOM should be forwarded to DTEC2.

Output Documents:

DTEC1-12.3.1.4 Draft update to G1128 'Specification on e-navigation technical services'

DTEC1-12.3.1.5 Draft service design template for SECOM

Actions Requested:

*The **Secretariat** is requested to forward the output documents DTEC1-12.3.1.4 Draft update to G1128 'Specification on e-navigation technical services' AND DTEC1-12.3.1.5 Draft service design template for SECOMto DTEC2 as input documents.*

7.8 Maritime Resource Names (MRN)

Task Group Leader: Ricky Withers

Referencing Document(s): Input Paper to NCSR 10

The paper NCSR 10/7 underscores the critical importance of harmonizing identifiers in the maritime sector through the MRN.

The proposal was received positively during the meeting, and NCSR noted a proposal for the development of an MSC circular to provide guidance to Member States on the use of maritime resource names, invited interested Member States and international organizations to submit detailed proposals to a future session. (NCSR 10/22)

Taking this prospect, the significance of the MRN was discussed during DTEC 1. The consensus was to produce an input paper for NCSR 11, emphasizing MRN use cases across various industries and countries.

After further deliberation, it is suggested that an IMO Circular submission may at this time, may not be the best course of action.

Further deliberation is required to ascertain the course of action noting the comments produced in NCSR 10/22.

AMSA is invited to coordinate collaboration of MRN use cases from member states as an input paper to DTEC 2. This could be considered as an annex for current IALA Guidelines.

Actions requested:

***Ricky Withers** from AMSA is invited to submit an input paper on MRN to DTEC2 and ARM17.*

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. They noted the ongoing success of the hybrid working environment.

Throughout the week, a number of focused WG sessions, were held. The WG focused on the following tasks:

- Review of Emerging Technologies, including a presentation session
- Development of the Maritime Communications Manual (MarCom Manual) based on the work carried out during the last work session (relates to revised approach for MRCP)
- Develop a guideline for migrating current analogue VHF voice communications to digital VHF voice communications (Work Programme reference: S1060, 6.1)
- Proposal to develop a guideline on use cases relates to IMT-2030 (Work Programme reference: S1060, 6.1)
- Development of MASS Guideline (noting upcoming IALA MASS Workshop and MASS Task Force) (Work Programme reference: S1010, 1.1)
- Discuss process for new tasks – develop guideline on the development and implementation of the digital fairway (Work Programme reference: S1070, 7.1); develop a guideline to move from test bed/trial to implementation of innovative solutions (Work Programme reference: S1010, 1.1)
- Identify expectations and approach (with IALA WWA) regarding training in implementation of digital solutions (Work Programme reference: S1050, 5.1)

8.1 Task on review of Candidate Technologies

Input papers DTEC1-3.1.5, and DTEC1-5.1.2.1 were reviewed. In addition, input to previous meetings regarding new technology reviews were considered.

Three presentations were provided related to technology and operational developments:

- Scott Beatty (MarineLabs) – *Rapid-deploy Sensor Unit for Smart Buoy.* The presentation presented the rapid-sensor unit capable to monitor ocean weather condition (e.g. Wind, Wave) with visual capability (e.g. 360 degree camera, vessel wake detection). The unit can be installed on top of existing buoy, turning present AtoN into 'Smart' Aton rapidly. In aspects of IoT technology, S Beatty explained his initial thoughts for IoT issues such as problem of standardization of MQTT and availability requirements.
- Jonas Lindberg (SPX) – *Harmonized Visual AtoN IoT.* The presentation indicated that there were ongoing harmonization activities on e-Navigation but the visual AtoN were mostly unconnected, or in closed systems. This means the time is right to introduce a harmonized IoT protocol for visual AtoNs. J Lindberg suggested that MQTT is a good solution in aspects of IoT protocol because of open and easy features and its security characteristics. The presentation, based on one provided to the IALA Conference in Brazil, invited members to adopt the MQTT protocol and message structures as the standard for the 'IALA Visual AtoN Protocol' (IVAP).
- Paul Herselman (Reutech) - *Passive Navigation Radar Receivers in Support of Maritime Vessel Monitoring*. The presentation noted current coastal surveillance scenario noting the present coastal radar system and its limitations in terms of horizon distance, performance degradation under poor weather conditions. All technologies have their limitations, but collectively they can present reliable, accurate maritime domain awareness. Limitations of current coastal radar can be overcome with the augmenting coastal radar/AIS with passive receiver direction finding. When they were installed two or more, they can provide approximately the position of monitoring targets by biangulation. He concluded that navigation radar detection and monitoring augmented current radar, not replaced it.

WG2 thanked three presenters for interesting and valuable application of new technologies introduced in the presentation.

8.1.1 Review of magnetic wave wireless transmission technology

Based on the detailed input received using the IALA G1153 template (DTEC1-5.1.2.1) the review of MS@MS magnetic wave wireless transmission technology was completed.

Although most of the review items were at Green status, some issues remained Amber such as constraints to use the technology and uncertainty around the IPR (Intellectual Property Rights).

During the discussion, the WG carefully considered a number of issues, including:

- scalability,
- liability, and
- environmental effect.

During the review there was a proposal to boost the outcome of review work to make it more widely available to IALA members beyond the sharing of the results of the reviews on the file share and the new technology review summary table.

Based on the results of the discussion, a liaison note was approved to forward to the ENG and ARM Committees (DTEC1-12.3.2.1).

The results of the review were placed on the IALA FileShare in the folder 'Committees / ENAV-DTEC / DTEC01 / DTEC01-WG2 / DTEC-WG2-New Technology Review / MS-MS Tech'

Action item

*The **Secretariat** is to forward the liaison note DTEC1-12.3.2.1 on the New Technology Review – Metal Surface Wave Technology (MS@MS), to the ENG and ARM Committees.*

8.1.2 Review of Ships' air draft remote measurement technology (SADRMT)

At ENAV 30, based on the input received and an introduction to the technology by China MSA, it was agreed that this technology would be suitable for further review. The technology provides a solution to address concerns over air draft clearance (ADC) that may be experienced with larger ships within the port environment.

To facilitate the review at DTEC02, the experts in the technology development, as presented by China MSA, were requested to populate the response section of G1153, as provided in ENAV30-5.1.2.4.1. While no input was received as input to DTEC01, members of the WG expressed continued interest in the technology development.

Action item

*That **Committee participants** with expertise on Ships' Air Draft Remote Measurement Technology (SADRMT) from China MSA and Shanghai and Maritime University are invited to populate the response section of G1153 (ENAV30-5.1.2.4.1) for review at DTEC2, noting there is broad interest in the Committee to progress the review.*

8.1.3 Review of Radar Sensor Technology to support maritime surveillance

Based on the presentation from Paul Herselman from Reutech, the WG agreed that further review of the technology should be carried out. P Herselman / Reutech were requested to populate the response section of IALA G1153 and complete, to the best of their ability, and submit the review template for input to DTEC02.

Action item

*That **Committee participants** on radar sensor technology to support maritime surveillance, as presented at DTEC1 (P Herselman / Reutech) be invited to complete the IALA G1153 template for the review of technology and provide to IALA for review at DTEC2.*

8.1.4 Review of Sigfox

Due to time limitations, the review of Sigfox, which was commenced during the last work term, was not completed. This work will be forwarded to DTEC2.

Action item

*The **Secretariat** is to forward the DTEC1-12.3.2.5 Updated review of Sigfox as a working paper to DTEC02.*

8.1.5 Summary of Candidate Technologies

At ENAV30 a summary table of the outcomes of the technologies reviewed was developed. This was forwarded to all IALA Committees for comment. A liaison from the ENG Committee (EM1 5.1.2.2) was reviewed, and the candidate technology summary table revised. At EM1 the Committee agreed a liaison note to be forwarded to the IALA Legal Advisory Panel (LAP) with a request to provide suitable wording for a

caveat to be included in the table. The wording of the caveat could note, for example, that the results of these reviews are for guidance only and should not be taken as an official IALA endorsement of any specific product or service. The response to the liaison notes is expected at DTEC02.

The summary table was revised and placed on the IALA Fileshare under 'Committees / New Technology Review. This folder will be updated each session, as technology reviews are completed.

As noted at EM1, with the continuing of the technology reviews in the 2023-2027 work term, there is an opportunity to review IALA G1153 with lessons learned. It was agreed that an update of G1153 would be suitable, looking to focus on structured outcomes from the reviews. This may also result in further amendments to the New Technology Review Summary Table.

Action item

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

*That **Committee participants** are invited to note the planned review of Guideline G1153 and provide comments to DTEC2 regarding proposed regarding, for example: amendments, clarity of instructions for completing, and possible consolidation of questions.*

8.2 Maritime Internet of Things

It was noted that this task was completed at ENAV30, with the publication of IALA G1179 – An introduction to the Internet of Things from an IALA perspective. The concept of the maritime internet of things (IoT) continues to evolve. Within the IALA Work Programme this task is identified under different task descriptions.

Title	Description	Expected outcome	Committee (*leading)
S1010, 1.1 Guidance on the use of simple IOT sensors on physical aids	Establish requirement for IOT sensors.	Guideline	ARM
S1060, 6.2 Define user requirements for Maritime Connectivity, Maritime Internet of Things (IoT), and MRN addressing (may be three subtasks)	Revised Guideline G1143 to include aspects relevant to MRN	Revised guideline	ARM

In addition, the report of PAP50 (provided in DTEC-3.1.4) reflected on the paper provided by Jonas Lindberg at PAP50-6.7.1.1, regarding IoT technology implementation. PAP noted that ENG would take the lead on consideration of this document.

Based on the presentations provided to DTEC1 WG2, and the following discussion, it was agreed that:

- A summary of the discussions from DTEC1 be provided to ENG and ARM in the form of a liaison note
- That the liaison note would highlight the work with regards to the internet of things, including IALA G1179

Action item

*The **Secretariat** is requested to forward the liaison note DTEC1-12.3.2.2 on the maritime internet of things to the ENG and ARM Committees.*

8.3 Task Maritime Communications (MARCOM) Manual

Task Group Leader: E Batty

The outcome from ENAV-EM1, along with the results of the IALA Digital Maritime Communications Workshop, were reviewed.

The MARCOM manual was amended and updated. Special attention was paid to the new table that still requires additional data on latency and user accessible data bandwidth.

The Working Group agreed that the Annexes contain valuable detailed information and should be taken out of the MARCOM manual and placed in a separate document and updated separate to the MARCOM manual. The result is that the MARCOM manual will be more focused on its target readership.

The paragraphs in the MARCOM manual that refer to WRC-23 and WRC-27 will be updated at the proposed intersessional meeting to reflect the outcome of WRC-23 and the focus of the MARCOM manual that supports the WRC-27 activities. It was noted that the MARCOM manual will be reviewed on a regular basis and updated as required, in a manner similar to the VTS manual.

In order to complete this document at DTEC2, it is proposed that two intersessional meetings be arranged so that the MARCOM manual is ready for completion at DTEC2. The first intersessional meeting will be held:

- 2 November 2023 from 0900-1000 UTC

Committee participants are requested to provide photos for inclusion in the manual, such as images of communication technology in use or antennae / towers.

Action item

*That **Committee participants** are invited to identify photos suitable for inclusion in the IALA MARCOM manual and provide these to IALA via contact@iala-aism.org prior to DTEC02.*

*That **Committee participants** are invited to join the intersessional task group on the MARCOM manual and indicate their interest to E Batty (ernie.b@imisglobal.com) by 9 October 2023, noting the dates and times of the intersessional meetings will be published on the IALA DTEC Committee Dashboard.*

*The **Secretariat** is requested to review the annexes from the MARCOM manual to be placed in a separate document and promulgated as appropriate.*

8.4 Proposal to Develop Guideline on use cases over IMT-2030

Task Group Leader: Hyounhee Koo

An update from IMT technologies (Hyounhee Koo) was provided. This included a review of DTEC1-5.2.1, 5.2.2 and 5.2.3. This relates to the IALA Work Programme S1060, 6.1 – Contribute towards the development of 3GPP mobile communications standards, with a specific focus on the maritime industry vertical.

The previous work in this area was noted, as provided in

- DTEC1-5.2.1 – Draft Recommendation on the use of international mobile telecommunications (IMT) by AtoN authorities
- DTEC1-5.2.2 – Draft Guideline on integration and use of International Mobile Telecommunications (IMT) technologies by AtoN authorities

Hyounhee Koo noted the development of IMT-2030, and the ongoing role of 3GPP within this development, based on the presentation provided. Noting the ongoing focus on use cases, the task will focus on developing these to provide to the appropriate bodies for consideration in the development of IMT-2030. The work on this task will be to continuously consider the use-case and requirements of the remit of IALA and maritime industry for consideration as the technology develops.

This task relates to the agreed work programme item:

Title	Description	Expected outcome	Committee (*leading)
S1060, 6.1 Contribute to the development of IMT-2030 by formulating user requirements for Marine AtoN.	Contribute towards the development of 3GPP mobile communication standards, with a specific focus on the maritime industry vertical.	Revised Guideline, Reportage, input to 3GPP	DTEC

The task will be progressed taking into account:

- Similar work in other transportation modes
- Results of studies and projects related to the implementation of IMT within the maritime environment
- The task group aims to develop an IALA guideline on IMT-2030 from an IALA perspective. This guideline will encompass IALA's interest in IMT-2030 development, include relevant use cases, service requirements, and coordinate with 3GPP.
- The scope of the guideline might cover the articulation of inputs that represent the needs of Marine Aids to Navigation stakeholders, ensuring their inclusion in the IMT-2030 standardization process within 3GPP.
- Task group meetings can schedule DTEC intersessional meetings, ensuring that the group's outcomes align with the standardization timeline of 3GPP. To incorporate insights from other committees, the task group will establish liaisons with other relevant committees accordingly.
- If needed, liaison notes from IALA may be formally shared with 3GPP, facilitated by the IALA secretariat.

The outcomes of the intersessional meetings will be submitted for further consideration at DTEC2.

The proposed dates for the intersessional meetings, which will be advised on the IALA Dashboard, are:

- 1 November 2023 0900-1030 UTC
- 20 December 2023 (time to be confirmed)
- 6 February 2024 (time to be confirmed)

Action Item

*The **Committee participants** are invited to join the intersessional task group working on developing use cases for maritime in IMT-2030 and to express their interest to Hyounhee Koo (koo@synctechno.com) by 22 October 2023, noting the dates and times of the intersessional meetings will be published on the IALA DTEC Committee Dashboard.*

8.5 Task MASS from marine AtoN point of view

Task Group Leader: To be advised

Input papers DTEC1-5.1.2.2, 5.1.2.2.1, 5.1.2.3, 5.1.2.4, 5.1.2.5, 5.1.2.6, 5.1.2.9, 5.1.2.9.1, 5.1.2.9.2 were reviewed. In addition, the work of the ICG (as provided on the fileshare) was noted.

Michael Trent and Minsu Jeon were welcomed to participate in the working group. Michael Trent summarized the work that led to the development of the revised table of contents of the guideline, as agreed by the MASS Task Force at their 5th meeting.

A summary of work at the IMO regarding the development of the non-mandatory MASS code was provided. The ITG reviewed the contents of MASS code and revised the guideline in line with the functional requirements approach.

The WG participants requested clarification on aspects of the new table of contents:

- Section 6. Considerations for the provision of ATON in a MASS environment
- Section 7. Considerations for the provision of VTS in a MASS environment

The term MATON was discussed and it was noted that MATON refers to Mobile Aids to Navigation. Also, Marine AtoN includes all elements within the IALA remit (VTS and Aids to Navigation). It was highlighted that

Section 6 is focused on AtoN, and the title of section 6 would be changed to 'Considerations for the provision of AtoN in a MASS environment'

It was noted that the guideline will continue to develop in line with work at the IMO and with other organisations. The outcomes of the upcoming MASS workshop at IALA will form a basis for further development of the Guideline.

Based on the development of the IMO MASS code the table of contents will be reviewed and may be revised further.

Action item

*The **Secretariat** is requested to inform the committees about the progress of the draft IALA MASS Guideline during the opening plenary of the committee meetings and send the working paper of the draft IALA MASS Guideline to the committees.*

8.6 Task Develop a Guideline on the development and implementation of a digital fairway

Task Group Leader: Kaisu Heikonen

The text of the work programme was noted, and the task register document reviewed. Following discussion on what is meant by 'digital fairway' it was proposed that the title of the task be revised:

Develop guidance for IALA members on the digitalisation of waterways

J-H Oltmann provided reference to existing work on assessing digital maturity of waterways, which was provided, including approaches that can be taken to identify maturity levels.

K Heikonen indicated that Finland was actively working in this area, and they may be able to identify a task group leader.

Action item

*The **Secretariat** is requested to amend the the title of the task in the Work Programme from 'implementation of a digital fairway' to 'Develop guidance for IALA members on the digitalisation of waterways' for consideration of IALA Council.*

8.7 Task Develop a Guideline to move from test bed/trial to implementation of innovative solutions

Task Group Leader: To be confirmed

This task will be commenced at DTEC2.

8.8 Task Develop a document on skills related to the digital environment

Task Group Leader: Wayne Quinn

The text of the work programme was noted, and the task register document reviewed.

The WG welcomed a presentation from the IALA WWA on the vision for future skills development and the evolved competency framework. The discussion noted the role of the IALA WWA and the results of different technical missions to members. The wide range of capabilities and skills was noted.

Initial discussion on the task identified a number of areas for development, including:

- Terminology and definitions ('lexicon' of terms)
- Data governance / management
- Data sharing
- Dealing with large quantities of data
- Data quality
- Value of combining data sets
- Examples / case studies

A summary of the discussion was consolidated into a working paper, to be forwarded to DTEC02.

The work will progress between DTEC1 and DTEC2 through an intersessional meeting, which will be advised on the IALA Dashboard:

- Date to be advised 2023 0900-1030 UTC

Action item

*The **Secretariat** is requested to forward the summary of discussion on the task 'develop a document on skills related to the digital environment' to DTEC02.*

8.9 Task Develop a guideline for migrating current analogue VHF voice communications to digital VHF voice communications

Task Group Leader: [UK MCA – to be confirmed]

Work Programme reference: S1060, 6.1

Input paper DTEC1-3.3, 3.5, 5.1.2.8

An overview of work done regarding digital voice over VHF was provided. This noted that the ENAV Committee identified options for digital voice over VHF at ENAV23, with input paper ENAV23-3.1.2 – Feasibility of digitization of voice in the VHF maritime mobile band from the CEPT Electronic Communications Committee Working Group. ENAV23 considered the input and responded to ECC (ENAV23-12.1.8) noting:

1. *That any evaluated technologies have a clear migration path both from the current analogue systems to the new digital systems by allowing both the digital and analogue systems to co-exist in the same transceiver for the duration of the entire migration period. This could extend to using the same antenna and other existing physical installation hardware.*
2. *The channel efficiency be a high priority by allowing up to four (4) digital voice channels for each 25Khz maritime VHF voice channel.*
3. *The digital service includes the capability of transmitting the location of the radio for the entire duration of the digital voice conversation.*
4. *The digital service allows a Short Message Service (SMS) without the need to set up a digital or other voice call.*
5. *The digital voice quality be similar to or better than the analogue voice service especially using weaker radio signals at the extents of the radio coverage.*

IALA is currently evaluating digital Private Mobile Radio (dPMR) as one of the candidate technologies and is able to share high-level evaluation reports when this process is completed.

Over subsequent meetings IALA ENAV Committee continued to review dPMR, completing the IALA G1153 – New Technology Review at ENAV-EM1. During the course of the review, DTEC received the results of trails on the use of Digital VHF, including presentations on the trail in the Port of Rotterdam. Developments in the CODEC were also reviewed, with focused input from CML on vocoders for digital voice channels in VHF provided by D Love (ENAV26-8.2.2.1) and a presentation at ENAV-EM1 on CODEC 2 from D Rowe.

The work on digital VHF voice in the maritime mobile band has continued over the years within different organisations, including at the ITU where WP5B finalized work on a new report on digital voice communication in the VHF maritime band (provided at DTEC1-5.1.2.8). The aim of this report is to investigate the possible expansion of the number of VHF maritime voice channels based on the introduction of digital technology. Analyses concerning reliability, GMDSS, mode of operation (simplex/duplex), bandwidth, range, etc. are the necessary milestones to decide on the feasibility of introduction of digital voice radio telephony in the VHF maritime mobile band.

Depending on the decisions taken at the upcoming ITU Radiocommunication Assembly (ITU-WRC23), the following questions on Digital Voice Communications should be studied:

- What are the technical and operational characteristics and possibilities for expansion of the number of VHF maritime voice channels based on the implementation of digital technology?

- What are the most appropriate ways for more efficient use of current frequencies used by VHF maritime voice channels by using digital technology?
- What are the technical and operational criteria to establish the seamless migration or coexistence of current analogue voice channels VHF channels next to digital channels?

NCSR 10 noted the IMO position on the ITU WRC-23 agenda item regarding the inclusion of 'digital voice in VHF radiotelephony' and invited Member States and international organizations to submit relevant proposals for a new output to MSC 108.

In discussion, the limitation of the focus of the migration for digital VHF voice was highlighted – which led to the group to consider more broadly the task title.

Discussion focused on:

- A 'goal based approach' with the focus on the requirement for the comms - use cases with strategic vision – i.e. current state, 5yrs, 10 yrs, 15-20 yrs. The use case work could be linked to the task on IMT-2030
- Based on the use cases the requirements for digital communications can be identified
- As a sub-set to the broader scope, guidance on the migration of analogue to digital VHF can be considered, including infrastructure aspects
- Work needs to take into account the ship/shore communication requirements, existing SOLAS carriage requirements and developments in IMT-2030
- Sharing of experience and strategic digital communications vision from IALA members could assist with this task

A working document in the form of a mind map (DTEC1-###) as a summary of the discussion was prepared, which will be forwarded to DTEC2.

The text of the work programme was noted, and the task register document reviewed. Following discussion on developments of digital communication it was proposed that the title of the task be revised:

Develop a guideline and roadmap for migrating current analogue VHF voice communications to digital maritime voice communications.

Action item

*The **Secretariat** is requested to amend the title of the task in the Work Programme from 'Develop a guideline for migrating current analogue VHF voice communications to digital VHF voice communications' to 'Develop a guideline and roadmap for migrating current analogue VHF voice communications to digital maritime voice communications' for consideration of the Council.*

8.10 Review of IALA Work Programme 2023-2027 and DTEC WG2 Task Register

The IALA work programme (DTEC1-3.1.5) was reviewed in conjunction with the DTEC WG2 detailed task register.

The Task Register was updated, noting that it is a living document and will be reviewed at each meeting.

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

9.1 Synopsis of the session

The group worked broadly on all received inputs from the WG3 Intersessional, all official provided inputs and informal inputs related to AIS, VDES and VDES R-mode.

The work programme was reviewed and members were reminded to provide inputs to tasks not yet addressed by any inputs.

All files referred to in this report are found on the IALA DTEC file share, under the folder "WG3/20230925_DTEC1".

9.2 Agenda

The agenda for the workgroup for the week was reviewed with the group and agreed after screening the inputs.

9.3 Status on other bodies

- ITU (Stefan Bober)
    - WRC23 will have to decide if R-mode and Digital voice are taken into the agenda for WRC31.
    - There is still a possibility to get these decisions into WRC27, but it would require active intervention at WRC23 by the administrations supporting an earlier change of the Radio Regulations, if needed.
    - For R-mode ITU decided in the last WP5B meeting that a report and a study question are to be addressed by a WP5B subgroup which is chaired by Ronald Raulefs from DLR.
    - For R-mode the study question might reveal if a change of the ITU Radio Regulations at all is necessary.
    - The work on the revision of ITU-R M.1371-5 is expected to finish not before 2025
    - The plan of DTEC WG3 is to provide the first input on the revision of ITU-R M.2092-1
- IEC (Stefan Bober)
    - IEC will have to revise all AIS test standards consequentially to the upcoming revision of ITU-R M.1371-5
    - The IEC VDES test standard work is to be ready by August 2025 and the new standard published by IEC in August 2026
- RTCM (Stefan Pielmeier)
    - The new RTCM SC139 special committee will handle the standardization of the Maritime Messaging System, proposed by the Maritime Connectivity Consortium MMS working group.
- MCC (Stefan Pielmeier)
    - The MCC published a draft Maritime Messaging Service specification, found at https://maritimeconnectivity.github.io/maritimeconnectivity.net/docs/20230814_MCC_MMS_Spec_draft.pdf

9.4 Presentations

The Netherlands presented challenges and monitoring of AIS VDL, found in "PRESENTATIONS/ 20230925_DTEC1_WG3_Netherlands-AIS_monitoring.pdf".

Claire from NSoneSoft from South Korea presented "PRESENTATIONS/DTEC1_Presentation of VDES R&D project by NSONESOFT.pdf"

Hans Haugli from Space Norway presented "PRESENTATIONS/VASP IALA DTEC1 WG3 20230927.pdf".

9.5 Introduction of ASM into S-100 with VDES

Input DTEC1-5.3.1.9 was discussed together with WG1, the co-chair of WG1 was chairing the session.

It was discussed what the goal of the work should be.

The group concluded:

- ASM is not a product, it can carry any product inside itself

- S-100 can be used to display information directly on ship display units, portrayal is defined
- S-230 could cover the products that are not addressed today by other S-100 products
- S-100 standard could be extended with the methods how to transport S-100 over ASM, VDE or other new transport means and how to encode S-100 products for that purpose.
- That it is desirable to have one registry for the product specifications

As the topic is very diffuse and lead to a lot of discussions, without clear conclusions what is the work, the combined WG1 and WG3 asks the proposer of the task to reiterate on the input DTEC1-5.3.1.9 to more clearly define the proposed actions such that the working groups can start the work on it.

9.6 Revision of Guideline G1117

The group discussed how far it is appropriate that G1117 recommends the use of VDES for Maritime Safety Information (MSI), as that term would imply expectations at IMO, that VDES today cannot fulfill.

The proposal discussed is to change the name of MSI to a more appropriate term to avoid conflicting expectations at IMO. The DTEC chair proposed to find a new name during the ITU/IMO expert group.

It is proposed to update table 1 based on the decision of MSC108 in 2024.

The input "INPUT/G1117/20220230315_G_CP_LiYang.docx", which was carried over from the intersessional was approved. For the intersessional report, see DTEC1-5.1.3.10.

The group will wait until after MSC108 before amending the document, all approved change proposals are carried as Working document to DTEC-2, and new IMO references will be.

9.7 VDES VHF Data Link Integrity Monitoring Guideline

China MSA presented the current version of the Guidline to the working group.

Earny Batty (Industrial member) and Jean Francois Cotu (Canada) provided change proposals to the group as part of the plenary work.

The group reviewed these change proposals, and approved them as amended in plenary.

China MSA merged the changes into the draft for submission to silent approval and publishing.

A liaison note to IMO NCSR11 was prepared in:

"OUTPUT/20230928_LN_to_IMO_Integrity_Monitoring.docx".

Action Item

*The **Secretariat** is requested to submit the draft new guideline DTEC1- 12.3.3.2 on VDES VHF Data Link Integrity Monitoring to council for approval.*

Action Item

*The **Secretariat** is requested to send the draft liaison note to IMO to council for approval, and send it to IMO after the new Guideline on VDL link monitoring is published.*

9.8 Work Programme 2023-2027 and WG3 task register

The group walked through the input EM1-5.4 IALA committee work programme 2023-2027 and the associated spreadsheet listing the tasks for the committee. Feedback from the working group was provided back to the DTEC chairs in "20230928_TaskRegisterDTEC.xlsx".

Some tasks are subject to discussion at the next DTEC preparatory chairs meeting.

The group noted and previewed the new online task register and welcomes that work done by IALA, expecting the new tool to simplify the work with the tasks significantly.

9.9 VDES resource sharing

The group was presented PRESENTATIONS/VDES Coordination KY_DTEC1_0927 2023.pptx introducing the idea of sharing of satellite network sharing.

DTEC1-5.1.3.5 is presented by Koichi Yoshida pointing out the opportunities and the importance of coordination and sharing of VDES resources between the active VDES players. The group noted that the proposed activity is part of the DTEC program. Koichi Yoshida is inviting any kind of intputs for the next ENAV, or personally to yoshida@rime.jp.

The workgroup chair notes that the VDES Alliance has a working group working on an IALA input for this activity.

Space Norway informed the group about the ESA project that Space Norway has together with Sternula, called MaSSha, which also addresses satellite roaming.

This task also shall adress the sharing of radio ressources for VDE-TER, but the working group does not know of any activities that are working on solving these challenges, yet.

Ronald Raulefs notes that overlapping terrestrial VDES base stations are welcome for R-mode.

Hans Haugli notes that satellite R-mode might have to be considered.

Jean Francois Cotu noted that the process to coordinate between terrestrial base stations and across neighboring countries could be the same, ideally one process covers them all.

Ronald Raulefs and Jean Francois Cotu note that a solution could be to use the 50kHz channels of the VDE-TER to have one extra method for terrestrial ressource sharing, especially between countries. However, these 50kHz link IDs are not subject to testing, reserved for future use in ITU-R M.2092-1. IEC would need to know if these Link IDs need to be included now into the first edition of the IEC 63514 VDES test standard.

The group concludes that we first need to get an overview over the different methods in a draft guidline, then we shall conclude on which changes are needed in ITU and IEC documents.

The group reviewed input DTEC1-5.1.3.2 introducing the challenges of overlapping terrestrial VDE basestations in China.

The group reviewed input DTEC1-5.1.3.7 introducing an automated TDMA resource sharing for terrestrial VDES networks.

9.10 VDES Performance Standard

The DTEC Chair presented the IMO/ITG EG 19/5 document on the topic of the IMO correspondance group on the draft VDES performance standard.

The technical and regulatory analysis document draft by the correspondance group that shall support the writing of the VDES Performance Standard identified problems, e.g.:

- the frequencies in use are not protected for the use in GMDSS and therefore MSI, and
- display of information is unclear,
- VDE-SAT formulation is stating that a change in ITU is unprobable.

The technical and regulatory analysis can be amended by verbal intervention through participating in the upcoming IMO/ITU expert group meeting in October 2023.

On the draft performance standard itself, following comments are given:

- the mobile stations shall contain either all VDE, ASM, AIS functions,
- potential remote upgrade of ship VDES equipment, where maybe other standards could be referred to, i.e. IMO Circ. 1389,
- in relation to display, we already have the minimum display from the AIS, which could be extended,
- on the topic of identification, MMSI is maybe not sufficient for the future.

9.11 VDES Clarifications

The group updated the Proposal for New Working Revision (PNWR) of ITU-R M.2092-1 input to ITU to be sent to ITU WP5B after WRC-23. The change log and current revision of the PNWR can be followed in the folder ENAV/WP3/Revision of M2092-1.

The Working Group acknowledged the work performed by the intersessional on VDES clarifications, summarized in the intersessional report DTEC1-5.1.3.10.

All proposed decisions by the intersessional were reviewed.

The inputs agreed during this meeting, as reviewed and amended, were (ENAV – DTEC/WG3/20230925_DTEC1/INPUT/VDES):

- DTEC1-5.1.3.3 (CHINA) was reviewed and amendments performed by China MSA
    - MSA-1 is approved as amended
    - MSA-2 is approved as proposed
    - MSA-3 is approved as proposed
    - MSA-4: all members to check until DTEC-2 if agreeable
- 20230315_Change Proposal for ITU-R M.2092-1_CHINA.doc
- 20230315_M2092_CP_SPN-1R2_sp_jlp Johnny.docx
- 20230922_M2092_1_CP_NA_JanS-1.docx
- 20230922_M2092_1_CP_NA_JanS-2.docx
- 20230922_M2092_1_CP_NA_JanS-3.docx
- 20230315_M2092_1_CP_NA_CML1.docx

The resulting updated Proposal for New Working Revision (PNWR) of ITU-R M.2092-1 is found in the folder ENAV – DTEC/WG3/Revison of M2092-1/.

Action item

*That **Committee participants** are invited to check the proposal DTEC1-5.1.3.3 MSA-3 and provide feedback at DTEC-2 for final decision.*

9.12 VDES R-Mode

The group reviewed Input DTEC1-5.1.3.4, amending the VDES R-mode guideline G1158 with a method to use also VDES ASM channels for terrestrial R-mode.

Due to the high level of complexity, the group decided to leave the proposed update for detailed review by the committee members until DTEC2, and consider revision of G1158 at DTEC2.

10. REVIEW OF OUTPUT AND WORKING PAPERS

The Committee reviewed and endorsed the reports of each Working Group. The Committee approved the output and working documents as indicated in ANNEX D.

11. REVIEW OF SESSION REPORT

The report of the meeting (DTEC1-13.1) was considered and approved. Committee Participants were requested to advise any corrections/amendments within one week, following which the final version of the report will be issued via the IALA web site.

Action item:

*The **Secretariat** is requested to forward the summary of the DTEC1 Committee report (DTEC1-13.1) to Council to note.*

12. DATE AND VENUE OF NEXT MEETING

The next physical session of the DTEC Committee is planned to be held from 18 to 22 March 2024 at Headquarters, Saint Germain-en-Laye. Other IALA events will be publicised on the IALA website.

13. CLOSE OF THE MEETING

The Committee Chairman thanked the Vice-Chair, working group Chairs and all Participants for their hard work and output during the session and the four-year work period. He thanked the IALA Secretariat for their support. Secretary-General celebrated the face-to-face meeting and good outputs from DTEC1, now proceeding to Council for approval.

ANNEX A **AGENDA DIGITAL TECHNOLOGIES COMMITTEE MEETING 1**

Digital Technologies Committee meeting 1 (DTEC1)

The opening plenary of the Digital Technologies Committee meeting 1 will be held physically at IALA HQ on the 25 September 2023 at 10.00 CEST (08.00 UTC) with the possibility to connect remotely and the closing plenary will be held online between 11.00 – 12.00 UTC on Thursday 5 October 2023. The physical week will take place at IALA HQ between the 25 – 29 September 2023, commencing with the opening plenary.

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 / Programme for the week	Jaime Alvarez
2.	Review of action items from last meeting	
2.1.	Review of action items from ENAV Extraordinary meeting	Hideki Noguchi / Jaime Alvarez
3.	Reports from other bodies and initiatives:	
3.1.	IALA	
3.1.1.	20th IALA Conference	Minsu Jeon
3.1.2.	General Assembly	Minsu Jeon
3.1.3.	IALA Council	Minsu Jeon
3.1.4.	Policy Advisory Panel (PAP)	Minsu Jeon
3.1.5.	WWA	Omar F Erikson
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.	ISO	Jin H Park / Minsu Jeon
3.8.	RTCM	Jorge Arroyo
3.9.	3GPP	Hyounhee Koo
3.10.	VDES Alliance	Stefan Pielmeier
4.	Presentations – 10 mins	
4.1.	Opening plenary	
4.1.1.	Maritime Connectivity Platform	Thomas Christensen / Axel Hahn
4.1.2.	AIS monitoring	Wim van Hoek (Netherlands)
4.1.3.	Australia's progression with VDES Trials and S-124 developments	Rick Withers (AMSA)
4.1.4.	Singapore's Integrated Port Operations Command & Control Centre (IPOC) system concepts & developments	Dennis Khoo (Singapore MPA)
4.1.5.	VDES Application Service Platform (VASP)	Hans Haugli (Space Norway)

4.1.6. Digitalisation activities and solutions — Jin H Park (AIVeNautics)

4.2. WG presentations (WG2 meeting room - 26 Sept / 0900-1030)

4.2.1. Reutech — Anthony Green

4.2.2. MarineLabs — Scott Beatty

4.2.3. Harmonized IoT for Marine Lanterns — Jonas Lindberg (Finland)

4.2.4. TBC

5. Review of input papers

5.1. Introduction of input papers to DTEC1

5.2. Allocation of input papers — Committee Chairs

5.2.1. Proposal on the work for the implementation of the ASM → joint WG1 and WG3 session

6. Work Programme and task list (2023 - 2028)

6.1. Presentation of the new work programme 2023 – 2027 — Hideki Noguchi

6.2. WG1 Working program and arrangements presentation — Axel Hahn

6.3. WG2 Working program and arrangements presentation — Jillian Carson-Jackson

6.4. WG3 Working program and arrangements presentation — Stefan Pielmeier

7. WG1 – Digital Information System

7.1. S-100 & S-200

7.2. Maritime Services

7.3. Cyber security

7.4. Maritime Resource Name

8. WG2 – Emerging Digital Technology

8.1. Maritime Autonomous Surface Ship

8.2. Digital Voice Communications

8.3. Single Window Data Exchange

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

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

The list of participants is available here.

	NAME	ORGANIZATION	MEMBER CATEGORY	COUNTRY
1	Gerrit Jan De Bie	Port of Rotterdam Authority	Associate	Netherlands
2	Jia Kim	Korea Maritime Transportation Safety Authority	Associate	Republic of Korea
3	Michael Kirkedal Thomsen	German Aerospace Centre	Associate	Germany
4	Han Jin Lee	KRISO	Associate	Republic of Korea
5	Jeongeun Lee	Korea Maritime Cooperation Center	Associate	Republic of Korea
6	Jose Luis Martin Sanchez	ESSP-SAS	Associate	Spain
7	Henri Selin	Fintraffic Vessel Traffic Services Ltd	Associate	Finland
8	Jiyeon Shin	Korea Maritime Cooperation Center	Associate	Republic of Korea
9	Kisoon Sung	Electronics & Telecommunications Research Institute	Associate	Republic of Korea
10	Jinwoo Kong	KRISO	Associate	Republic of Korea
11	Chen Charlotte	China HEAD Aerospace Technology Co.	Industrial	China
12	Sebastian Jensen	Sternula AS	Industrial	Denmark
13	Ugur Konar	HAVELSAN AS	Industrial	Türkiye
14	Mikael Olofsson	SAAB AB (Combitech/Navelink)	Industrial	Netherlands
15	Qiang Song	China Head Aerospace Technology Co	Industrial	China
16	Irene Yang	GMT Co, Ltd.	Industrial	Republic of Korea
17	Bugra Yildirim	HAVELSAN AS	Industrial	Türkiye
18	Younghun Kim	GMT Co, Ltd.	Industrial	Republic of Korea
19	Johann Larue	Airbus Defence and Space	Industrial	France
20	Johnny Balon	Instituto Oceanografico de la Armada	National	Ecuador
21	Aldrin Espinoza	Instituto Oceanografico de la Armada	National	Ecuador
22	Daniel Karbach	Federal Waterways and Shipping Administration	National	Germany
23	Chunxu Li	China MSA	National	China
24	Yasmin Mohd Hasni	Malaysia Marine Department	National	Malaysia
25	Mikael Renz	Swedish Maritime Administration	National	Sweden
26	Jaesheung Shin	Ministry of Oceans and Fisheries	National	Republic of Korea
27	Victor Vivanco	Dirección de Hidrografía y Navegación	National	Peru
28	Lv Xuwei	China Maritime Safety Administration	National	China
29	Jialin Liu	China Maritime Safety Administration	National	China
30	Johan Griffioen	Dutch Authority for Digital Infrastructure / Ministry of Economic Affairs and Climate Policy	Observer	Netherlands
31	Wim van Hoek	Dutch Authority for Digital Infrastructure / Ministry of Economic Affairs and Climate Policy	Observer	Netherlands
32	Ann Pletschke	Nautical Institute	Sister Organisation	

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	Action
DTEC1	1.2.1	Preliminary Agenda DTEC1	IALA	All
DTEC1	1.4	Programme for the week	IALA	All
DTEC1	2.1.1	EM1 Action Items	IALA	All
DTEC1	2.1.2	Report of EM1	IALA	All
DTEC1	3.1.1	Report 20th IALA Conference 2023	IALA	All
DTEC1	3.1.2	General Assembly 14	IALA	All
DTEC1	3.1.3.1	Report Council 77	IALA	All
DTEC1	3.1.3.2	Report Council 78	IALA	All
DTEC1	3.1.4	Report Policy Advisory Panel	IALA	All
DTEC1	3.1.5	Work programme 2023-2027	IALA	All
DTEC1	3.5	Report on ITU-R WP5B meeting 10 to 21 July 2023	Stefan B	All
DTEC1	3.5.1	Annex IMO LN to ITU on the revision of ITU-R M.1371-5	ITU	
DTEC1	5.0	Input paper Committee meeting template	IALA	All
DTEC1	5.0.1	List of input papers	IALA	All
DTEC1	5.0.2	LN from ARM to all committees on the progress of cyber security tasks (ARM16-11.3.4)	ARM16	All
DTEC1	5.0.2.1	Draft Guideline on Cyber Security (ARM16-11.3.4.1)	ARM16	All
DTEC1	5.0.3	Report of the Task Group 3.1.1. on Resilient PNT	ENG intersesional task	All
DTEC1	5.0.3.1	Draft IALA Guideline on Resilient PNT	ENG intersesional task	All
DTEC1	5.1.1.1	Introducing Maritime Connectivity Platform specifications	DLR, Germany KRISO, Republic of Korea Fintraffic, Finland GRAD, UK & Ireland AMSA, Australia Navelink	WG1

			UCPH, Denmark AIVeNautics, Republic of Korea	
DTEC1	5.1.2.1	Review of Radio-free wireless communication based on Metal Surface Wave	KRISO UNIST Sunny Wave Tech	WG2
DTEC1	5.1.2.2	Output from TG1.2.5 - Implications of MASS from a VTS perspective	VTS	WG2
DTEC1	5.1.2.2.1	Discussion paper - Implications of MASS from a VTS Perspective_Input to VTS54	VTS	WG2
DTEC1	5.1.2.3	Draft Guideline MASS implications for Shore Authorities_Input to VTS54	VTS	WG2
DTEC1	5.1.2.4	Draft Guideline on Provision of VTS to Autonomous and Conventional Ships	VTS	WG2
DTEC1	5.1.2.5	MSC 107-5 - Report of the Correspondence Group (Marshall Islands)	VTS	WG2
DTEC1	5.1.2.6	Road Map for Developing a Goal-based Code for MASS (MSC 107)	VTS	WG2
DTEC1	5.1.2.7	Harmonized Visual AtoN IoT protocol	SABIK	WG2
DTEC1	5.1.2.7.1	Harmonized Visual AtoN IoT Protocol_conference paper	SABIK	WG2
DTEC1	5.1.2.7.2	PPT Harmonized IoT for Marine Lanterns	SABIK	WG2
DTEC1	5.1.2.8	Digital Voice Draft New Report 14 August 2023 R19-SG05-C-0159!!MSW-E	ITU WP5B	WG2
DTEC1	5.1.3.1	Working draft of guideline on VDES VDL integrity monitoring	China MSA	WG3
DTEC1	5.1.3.2	Proposal for coordination of VDE terrestrial multiple base station services	China MSA	WG3
DTEC1	5.1.3.3	Proposal on the supplement of the ASM retransmission mechanism and other related content in ITU-R M.2092-1	China MSA	WG3
DTEC1	5.1.3.4	Proposal on the Revision of IALA Guideline G1158 VDES R-Mode	China MSA	WG3
DTEC1	5.1.3.5	Draft Guidelines for VDES resource sharing and cooperation Japan OPRI	OPRI	WG3
DTEC1	5.1.3.6	Satellite VDES service demonstrations in Norway (VASP)	Kongsberg Discovery - Seatex	WG3
DTEC1	5.1.3.7	Proposal on integrated management and coordination of TDMA slot resource sharing between VDE-TER shore stations	NSONESOFT	WG3

DTEC1	5.1.3.8	Project on Integrated Terrestrial-Satellite VDES System Compliant with International Standards	NSONESOFT	WG3
DTEC1	5.1.3.9	Proposal on the work for the implementation of ASM	JCG	WG3
DTEC1	5.1.3.9.1	ASM proposal attachment	JCG	WG3

ANNEX D LIST OF OUTPUT DOCUMENTS

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
DTEC1-	12.3.1.1	LN ARM ENG on Cyber Security guideline	DTEC	ARM / ENG
DTEC1-	12.3.1.1.1	Draft Guideline on Cyber Security - Post DTEC1	DTEC	ARM / ENG
DTEC1-	12.3.1.2	LN VTS on VTS Digital Services Architecture Development	DTEC	VTS
DTEC1-	12.3.2.1	LN ARM ENG on Technology review MS@MS	DTEC	ARM ENG
DTEC1-	12.3.2.1.1	Metal Surface at Magnetic Substance wave	DTEC	ARM ENG
DTEC1-	12.3.2.1.2	Completed Review of Radio-free wireless comms MS@MS	DTEC	ARM ENG
DTEC1-	12.3.2.2	LN ARM ENG on Developments on the Maritime Internet of Things	DTEC	ARM ENG
DTEC1-	12.3.3.1	VDES VDL Integrity monitoring	DTEC	Council
DTEC1-	12.3.3.2	LN to IMO on VDES VDL Integrity Monitoring	DTEC	Council

Working papers will remain within the Committee for further review during ENAV32.

Meeting	Agenda Item	Output Paper Title	Source	Action
DTEC1-	12.3.1.3	WP Maritime Connectivity Platform specifications	DTEC1	DTEC2
DTEC1-	12.3.1.4	WP Draft update to G1128 'Specification on e-navigation technical services'	DTEC1	DTEC2
DTEC1-	12.3.2.3	WP LN to ITU WG5B on Draft New Report ITU-R M.[Digital-Voice]	DTEC1	DTEC2
DTEC1-	12.3.2.4	WP Proposed new work items Digital fairway	DTEC1	DTEC2
DTEC1-	12.3.2.5	WP Review of Sigfox	DTEC1	DTEC2

ANNEX E **ACTION ITEMS**

Action Items for the Secretariat

1. The **Secretariat** is requested to forward the working paper DTEC1- 12.3.1.3 Maritime Connectivity Platform specifications to DTEC2 as an input document. 18
2. The **Secretariat** is requested to publish in the IALA website invite for the intersessional meeting on Maritime Connectivity Platform Specifications to be held in November 8th, 2024 and Jan 31st, 2024, both 12:00-14:00 UTC. 18
3. The **Secretariat** is requested to forward liaison note (DTEC1-12.3.1.1) and the annex (DTEC1-12.3.1.1.1) to ENG and ARM on the draftCyber Security Guideline. 19
4. The **Secretariat** is requested to forward the DTEC1-12.3.1.2 liaison note to VTS on Digital Service Architecture. 19
5. The **Secretariat** is requested to forward the output documents DTEC1-12.3.1.4 Draft update to G1128 'Specification on e-navigation technical services' AND DTEC1-12.3.1.5 Draft service design template for SECOMto DTEC2 as input documents. 20
6. The **Secretariat** is to forward the liaison note DTEC1-12.3.2.1 on the New Technology Review – Metal Surface Wave Technology (MS@MS), to the ENG and ARM Committees. 22
7. The **Secretariat** is to forward the DTEC1-12.3.2.5 Updated review of Sigfox as a working paper to DTEC02. 22
8. The **Secretariat** is requested to forward the liaison note DTEC1-12.3.2.2 on the maritime internet of things to the ENG and ARM Committees. 23
9. The **Secretariat** is requested to review the annexes from the MARCOM manual to be placed in a separate document and promulgated as appropriate. 24
10. The **Secretariat** is requested to inform the committees about the progress of the draft IALA MASS Guideline during the opening plenary of the committee meetings and send the working paper of the draft IALA MASS Guideline to the committees. 26
11. The **Secretariat** is requested to amend the the title of the task in the Work Programme from 'implementation of a digital fairway' to 'Develop guidance for IALA members on the digitalisation of waterways' for consideration of IALA Council. 26
12. The **Secretariat** is requested to forward the summary of discussion on the task 'develop a document on skills related to the digital environment' to DTEC02. 27
13. The **Secretariat** is requested to amend the title of the task in the Work Programme from 'Develop a guideline for migrating current analogue VHF voice communications to digital VHF voice communications' to 'Develop a guideline and roadmap for migrating current analogue VHF voice communications to digital maritime voice communications' for consideration of the Council. 28
14. The **Secretariat** is requested to submit the draft new guideline DTEC1- 12.3.3.2 on VDES VHF Data Link Integrity Monitoring to council for approval. 30
15. The **Secretariat** is requested to forward the summary of the DTEC1 Committee report (DTEC1-13.1) to Council to note. 33

Action Items for Participants

16. The **DTEC Chair** is requested to send a request for a hybrid meeting on Maritime Connectivity Platform Specifications to Secretary General to be held in Copenhagen back-to-back with Digital@Sea in February 2024. 18
17. That **Japan Coast Guard** is requested to submit a revised proposal on Activity on ASM reflecting opinions collected during the joint meeting between DTEC WG1 and WG3. 19

18. **Ricky Withers** from AMSA is invited to submit an input paper on MRN to DTEC2 and ARM17. 20
19. That **Committee participants** with expertise on Ships' Air Draft Remote Measurement Technology (SADRMT) from China MSA and Shanghai and Maritime University are invited to populate the response section of G1153 (ENAV30-5.1.2.4.1) for review at DTEC2, noting there is broad interest in the Committee to progress the review. 22
20. That **Committee participants** on radar sensor technology to support maritime surveillance, as presented at DTEC1 (P Herselman / Reutech) be invited to complete the IALA G1153 template for the review of technology and provide to IALA for review at DTEC2. 22
21. That **Committee participants** are invited to provide information on candidate technologies for review using the template provided in IALA Guideline 1153. 23
22. That **Committee participants** are invited to note the planned review of Guideline G1153 and provide comments to DTEC2 regarding proposed regarding, for example: amendments, clarity of instructions for completing, and possible consolidation of questions. 23
23. That **Committee participants** are invited to identify photos suitable for inclusion in the IALA MARCOM manual and provide these to IALA via contact@iala-aism.org prior to DTEC02. 24
24. That **Committee participants** are invited to join the intersessional task group on the MARCOM manual and indicate their interest to E Batty (ernie.b@imisglobal.com) by 9 October 2023, noting the dates and times of the intersessional meetings will be published on the IALA DTEC Committee Dashboard. 24
25. The **Committee participants** are invited to join the intersessional task group working on developing use cases for maritime in IMT-2030 and to express their interest to Hyounhee Koo (koo@synctechno.com) by 22 October 2023, noting the dates and times of the intersessional meetings will be published on the IALA DTEC Committee Dashboard. 25
26. That **Committee participants** are invited to check the proposal DTEC1-5.1.3.3 MSA-3 and provide feedback at DTEC-2 for final decision. 32

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