



# IALA DTEC COMMITTEE

## REPORT OF THE FOURTH SESSION OF THE IALA DIGITAL TECHNOLOGIES (DTEC) COMMITTEE

**24 March – 03 April 2025**

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**03 April 2025**

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International Organization for Marine Aids to Navigation

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## Report of the fourth session of the IALA

### Digital Technologies (DTEC) Committee

### Executive Summary

The fourth session of the DTEC Committee was held from 24 March to 03 April 2025, including the physical week at IALA HQ between 24 to 28 March, chaired by Hideki Noguchi and vice-chaired by Dennis Khoo. The Secretary for the meeting was Alisa Nechyporuk.

143 participants from 28 countries, two Sister organisations in DTEC4. 35 participants attended for the first time.

The session began with an opening plenary and the physical week on Monday, 24 March and continued until Friday, 28 March. The Chair welcomed everybody, both old as well as new participants, to the meeting and was pleased to see so many faces at IALA HQ. An approval period was followed, and the virtual closing plenary was held on Thursday, 03 April.

The meeting was carried out in accordance with the *Committee Arrangements*.

Key outputs completed included:

DTEC4	15.2.4	New draft Guideline on Maritime Service Registry Technical Specification
DTEC4	15.2.5	Revised G1128 Ed1.7 Specification of e-Navigation Technical Services
DTEC4	15.4.1	Information paper on VDES to MSC 10
DTEC4	15.4.2	New draft Guideline on VDES authentication
DTEC4	15.4.3	New draft Guideline on VDES signal measurement

The following liaison notes were approved:

DTEC4	15.2.1	Liaison note to ARM on MRN Intersessional work
DTEC4	15.2.2	Liaison note to IEC on SECOM OpenAPI specification
DTEC4	15.2.3	Liaison note to IEC on S-421 schema
DTEC4	15.3.1	Liaison note to LAP on G1153 Review
DTEC4	15.3.2	Liaison note to ARM on IoT
DTEC4	15.3.3	Liaison note to ARM on AtoNs support autonomous navigation
DTEC4	15.3.4	Liaison note on S-100 AtoN Authority Perspective
DTEC4	15.3.5	Liaison note on IALA Digitalisation Discussion Paper
DTEC4	15.3.6	Liaison note to VTS on Digitalisation of Waterways

### Overall status of the DTEC Committee 2025 – 2027 Work Programme after DTEC4:

Standard	Scope	No.	Task	Comment	4	5	6	7	8	9	Coop. entity
					2025	2025	2026	2026	2027	2027	
<b>S1010 Marine Aids to Navigation Planning and Service Requirements</b>	S1010.1 Obligations and Regulatory Compliance	1.1.1*	Consider developing guidance on the certification of technical equipment, information systems and technical infrastructure related to MASS in the domain of IALA	<u>New Guideline</u>  Develop a guideline on the certification of technical MASS equipment, information systems, and technical infrastructure within the domain of IALA		V	V	V			Not Started  WG1
	S1010.2 Marine Aids to Navigation planning	1.2.1*	Providing guidance on the process to implement developments of innovation	<u>New Guideline</u>  Develop a guideline on how to move from development test bed/trial reporting to implementation of innovative solutions	V	V					On track  WG2
		1.2.2*	Development of aspects of digital communications, including promoting broadband connectivity for operational technology	Based on IHO/IALA portrayal and IALA comms workshop output.	X	X	X	X			Finished  WG1
		1.2.3	Review relevant sections of the NAVGUIDE			V	V	V			Not Started  WG1, WG2, WG3
		1.2.4*	Develop guidance on the provision of Marine AtoN for autonomous vehicle/vessel operations (Maritime Autonomous Surface Ship, MASS)	<u>New Guideline</u>  The Guideline will be continued led by DTEC	V	V	V	V	V	V	On hold  WG2

Standard	Scope	No.	Task	Comment	4	5	6	7	8	9	Coop. entity
	S1010.4 Risk management	1.4.1*	Develop Guidance on Risk Assessment and Certification Methods in the context of e-Navigation	<u>Recommendation or guideline</u>  Development of guidance documents on Risk Assessment and Certification Methods in the context of e-Navigation		V	V	V			Not Started  WG1
		1.4.2	Develop guidance on cyber security for Marine AtoN	<u>Guideline</u>							Finished (G1182) WG1
S1020 Marine AtoN design and delivery	S1020.2 Design, Implementation & Maintenance	2.2.1	Full review of A-126, G1084 and other AIS associated documentation	<u>Revised recommendations and guidelines</u>		V	V	V			Not Started WG3
S1040 Vessel Traffic Services	S1040.3 VTS Communications	6.3.2	Develop guidance on VTS digital communications	<u>New Guideline</u>  Develop a guideline for migrating current analogue VHF voice communications to digital VHF voice communications		V	V	V	V	V	On track  WG3
S1050 Training and Certification	S1050.1 Training and assessment	5.1.1	WWA lesson plans to review	<u>Review and update of the WWA Lesson plans</u>		V	V	V			Not Started WG2, WG3
		5.1.2	Training in implementation of digital solutions (data analytics & maritime informatics)	<u>New Guideline and training programme</u> Develop a guideline on skills related to the digital environment, such as data analytics and maritime informatics and associated training programs with WWA		V	V	V			Not Started  WG2

Standard	Scope	No.	Task	Comment	4	5	6	7	8	9	Coop. entity
S1060 Digital Communication Technologies	S1060.1 Wide and medium bandwidth systems	6.1.1*	Review and update R0144 and G1095 - Update to the latest development of VTS	<u>Recommendation and Guideline</u>	V						On hold  WG1, WG3  DTEC4 requested the Secretariat to move this task to ARM
	S1060.2 Narrow bandwidth systems	6.2.1*	Contribute to the development of IMT-2030 by formulating user requirements for Marine AtoN	<u>Guideline, Reportage, input to 3GPP</u> Contribute towards the development of 3GPP mobile communication standards, with a specific focus on the maritime industry vertical	V	V	V	V	V	V	On track  WG2
	S1060.3 Harmonised maritime connectivity	6.3.10*	New IALA Guideline on VDES system integration into ship and shore side	<u>New Guideline</u>  Develop documentation on the integration and operations of VDES for different user groups - leveraging the capabilities VDES provide and maintain them by managing the resource by optimized operations	V	V	V	V	V	V	On track  WG3
		6.3.11*	Recommendation for the AIS Service	<u>New Recommendation</u>  Develop Recommendation for the AIS Service Planned in draft Standard S1060 (supersedes A- 124). Move recommendation A-124 content to Recommendation R0123 or remainder to Guideline(s)	V	V	V	V	V	V	On track  WG3

Standard	Scope	No.	Task	Comment	4	5	6	7	8	9	Coop. entity
		6.3.12*	Review of the contents of A-124 series recommendations	<u>New Guideline</u> A-124 APPENDIX 0 to APPENDIX 19 become Guidelines for Recommendation R1008: Move recommendation A-124 content to Recommendation R0123 remainder to Guideline(s)	V	V	V	V	V	V	On track  WG3
		6.3.13*	Develop guidance on NAVDAT development considering shore based infrastructure	<u>New Recommendation and Guideline</u> Draft Recommendation and Guideline for Digital navigational data system (NAVDAT) considering shore based infrastructure		V	V	V	V	V	Not started  WG2
		6.3.2*	Develop guidance on Digital VHF communication	<u>New Guideline</u> Develop a guideline for migrating current analogue VHF voice communications to digital VHF voice communications	V	V	V	V	V	V	On hold  WG2 WG3
		6.3.3*	Develop a Guideline for VDES VDL integrity monitoring	<u>New Guideline</u> Provide references and advice for authorities to monitor the integrity of VDL. Internally, make VDES VDL operating normally. Externally, specify the common services and functions of the AIS/VDES VDL monitoring system or platform							Finished (G1181)

Standard	Scope	No.	Task	Comment	4	5	6	7	8	9	Coop. entity
		6.3.4*	Develop Guidelines on VDES Authentication Techniques	<u>New Guideline</u> Describe potential methods for authenticating VDES transmissions, including VDES R-Mode signals. Provide basis for the development of an international standard for VDES authentication, so that all mariners can have trust in e-navigation communications and future resilient positioning, navigation and timing solutions based on VDES	V	V	V	V	V	V	On track WG3
		6.3.5*	Develop Guidelines on VDES resource sharing and coordination/cooperation	<u>New Guideline</u> Develop a guideline that provides framework of VDES resource sharing and coordination / cooperation for VDES satellites providers, VDES land-stations and VDES users to realize smooth and effective VDES communications on both official and private communications	V	V	V	V	V	V	On track WG3
		6.3.6*	Review and update R1007 The VHF Data Exchange System (VDES) for shore infrastructure	<u>Revised R1007</u> Update to the latest development of AIS							Finished WG3

Standard	Scope	No.	Task	Comment	4	5	6	7	8	9	Coop. entity
		6.3.7*	Liaise with ITU on Recommendation ITU-R.M 2092-1	<u>Liaison note</u> LN to ITU WP5B in regards with the Recommendation ITU-R.M 2092-1: Consider future development of VDES	V	V	V	V	V	V	On track  WG3
		6.3.8*	Liaise with IEC on the Test standard for VDES	<u>Liaison note and input document</u> Test standard for VDES: Contribute to the development of VDES test standard	V	V	V	V	V	V	On track  WG3
		6.3.9	Develop guidance on documentation on communications channels for public service digital information services in coastal areas	<u>New Recommendation or Guideline</u> Develop documentation on (free-to-air, non-commercial) communications channels to be used by coastal authorities for digital information transfer between ship and shore in coastal areas may absorb A-123 and A-124	V	V					Not started  WG2 / WG3
S1070 Information Services	S1070.1 Data models and data encoding	7.1.1*	Develop a discussion paper on digitalisation in the scope of IALA	<u>Discussion paper</u> Development of a vision for digitalization of shipping and maritime transportation - Document sketching the IALA vision on digitalization of waterways and shipping	V	V	V				On track  WG2

Standard	Scope	No.	Task	Comment	4	5	6	7	8	9	Coop. entity
		7.1.2*	Develop guidance on Digital Fairway	<u>New Guideline</u> Develop a guideline on the developments and implementation of the digital fairway. Reference G1058 and G1097	V	V					On track  WG2
		7.1.3*	Review G1114 A Technical Specification for the Common Shore-based System Architecture (CSSA)	<u>Revised Guideline</u> Consider developing a System Architecture Concept for Digitalized Waterways and Maritime Transformation: Architecture Pattern, Architecture Overview, Architecture Details / Platforms / Services		V	V	V	V	V	Not started  WG2
		7.1.4*	Consider developing a Recommendation for digital platforms	<u>New Recommendation</u> Recommendation on platforms to be used for implementation of the proposed Architecture (G1114 Update): Definition of the architecture based on Updated G1114, Description of platform elements							Finished  WG1
		7.2.1	Contribute to the standardization efforts with respect of the requirements of the S-100 domain experts		V	V	V	V	V	V	On track  WG1
		7.1.6	Development of MCP-related IALA documents		V	V	V				WG1

Standard	Scope	No.	Task	Comment	4	5	6	7	8	9	Coop. entity
		7.1.15	Consider the Development of Product Specification for Disaster Management		V	V	V	V	V	V	On track WG1
	S1070.2 Data exchange systems	7.1.5*	Review G1128 Specification of e-Navigation technical services	Review G1128 Revise the Guideline from basic concepts and guideline for developers on technical services adjusted to the digital platform concepts. Reference G1155	V						Finished  On track (G1143)  WG1
		7.1.14	Defining IALAs Role in MCP Trust Infrastructure			V	V	V			Not started WG1

**Legend:**

Blank: Ongoing or scheduled task  
 Light orange: To Council to note or approve  
 Light grey: Task completed or deleted  
 X: Prolonged task

**Legend for task numbering:**

Digit 1: WG 1, 2 or 3  
 Digit 2: S1040 VTS Scope No.; Other standards = 8; Standard not available = 9  
 Digit 3: In sequence (1, 2, 3 etc.)  
 Digit 4: Sub task a, b, c...(if needed)

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## Report of the fourth session of the IALA Digital Technologies (DTEC) Committee

### 1. INTRODUCTION

The fourth session of the DTEC Committee was held from 24 March to 03 April 2025, including the physical week at IALA HQ between 24 March to 28 March, chaired by Hideki Noguchi and vice-chaired by Dennis Khoo. The Secretary for the meeting was Alisa Nechyporuk.

The session began with an opening plenary and the physical week on Monday, 24 March, and continued until Friday, 28 March. The Chair welcomed everybody, both old as well as new participants, to the meeting and was pleased to see so many faces at IALA HQ. An approval period was followed, and the virtual closing plenary was held on Thursday, 03 April.

143 participants from 28 countries, two Sister organisations in DTEC4. 35 participants attended for the first time.



#### 1.1 Welcome from the Secretary-General

Deputy Secretary-General Omar Frits Eriksson warmly welcomed participants to Headquarters, including those joining online. He congratulated Hideki Noguchi on his reappointment as Chair and Dennis Khoo on his appointment as Vice-Chair of this important committee.

He reported on the General Assembly held in Singapore last month, which had over 350 participants. Key outcomes included the approval of governance documents, the election of the President, Vice President, Secretary-General, and Council, and the welcome of Albania, Belgium, Croatia, and Romania as new Council members. The IGO is now fully operational.

The relocation project is progressing well, thanks to the generous financial support of the French government. The timeline involves a contract signature in late spring, construction beginning immediately after summer, and

HQ completion by September/October 2026. The Plenary building is expected to be finished in late 2027. Council and Committee meetings will likely be held away from HQ between June and September/October 2026, with invitations extended to members to host these meetings.

Planning has begun for the next Conference/GA in Mumbai in Q3 2027, with dates to be announced soon. The next Symposium is scheduled for early 2029, followed by the May/June 2030 Conference.

The Deputy Secretary-General expressed interest in the diverse range of input papers presented, about 70 in total, particularly focusing on the Maritime Connectivity Platform, Maritime service registry, Maritime identity registry and its messaging service, Digitalization of waterways, MASS, Cybersecurity, and VDES. These are all very interesting and important topics, some of which reach across all committees and require careful coordination between the committees. This is where the new Policy Advisory Panel comes in.

He extended his best wishes for the meeting, thanking participants for their contributions in the spirit of the IALA family and expressing anticipation for further discussions throughout the week.

## 1.2 Approval of the agenda

The agenda was reviewed and approved (DTEC4-1.2.1).

## 1.3 Apologies

No apologies were received. A list of participants who attended DTEC4 can be found on the IALA Dashboard for DTEC and in Annex B.

## 1.4 Working Arrangements

The Committee Secretary made the following statement on the IALA General Data Protection Policy:

*IALA complies with the General Data Protection Regulations of the European Union. IALA will include a list of participants with their contact information in the report of this meeting. Any participant who wishes to remove their contact details from the participant's list should advise the Committee Secretary as soon as possible.*

The Committee Secretary asked the following statement:

*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.*

No patents were noted.

The Committee Secretary gave all participants a briefing on the *Committee Working Arrangements* document and available tools. This brief included an overview of the DTEC4 Action Plan that had been agreed by the DTEC Committee Management Team (CMT) to be progressed during DTEC4 through Task Groups (TG). Each task had a deadline for expressions of interest to participate to the specified Task Group Leader (TGL) by a specific date.

The Action Plan, which can be found on the IALA Dashboard for DTEC, displayed task items that were worked on at DTEC4.

The deadline for submitting documents to the silent approval procedure was set to 28 March 2025, 12:00 UTC, for documents forwarded to the ARM committees and 02 April 2025, 20:00 UTC, for other documents due to these [deadlines](#).

## 2. REVIEW OF ACTION ITEMS FROM DTEC3

The Committee Secretary confirmed that all Secretariat actions from DTEC3 were completed (input paper DTEC4-2.1.1).

### 3. REPORTS FROM OTHER BODIES

#### 3.1 IALA

##### 3.1.1 IALA General Assembly

Minsu Jeon, IALA Technical Director, reported on the IALA General Assembly held in Singapore from 18<sup>th</sup> to 20<sup>th</sup> February 2025. He mentioned two input papers, DTEC4-3.1.1 on the first General Assembly and DTEC4-3.1.1.1 on Credentials, participation, and numbering in IALA committees and subsidiary bodies as an IGO.

Key outcomes included adopting the declaration on IALA, Brazil's election as President, India's election as Vice-President and Francis Zachariae's election as Secretary-General. The assembly approved governance documents such as general and financial regulations. It retained the existing committee structure with ARM, ENG, VTS and DTEC as the four committees and confirmed the policy and legal advisory panels as subsidiary bodies. The General Assembly also decided that all standards, recommendations, guidelines, manuals, model courses, and other relevant documents from the former IALA will remain in effect under the new organization until they are reviewed or replaced.

##### 3.1.2 IALA Council

Minsu Jeon reported on two Council meetings since the last DTEC3 committee meeting, referring to the input papers DTEC4-3.1.2.1, DTEC4-3.1.2.1.1, and DTEC4-3.1.2.2.

The 3rd Transition Council meeting occurred from 10 to 13 December last year at the IALA HQ and was the final Transition Council meeting before IALA became an IGO. Discussions focused on governance, financial stability, technical progress and strategic initiatives. The Council approved most technical documents, including Guideline 1128 on Specification of e-Navigation Technical Services and Guideline 1183 on Provision of MCP identities. The Council approved a workshop proposal on maritime communication technologies (IMT) in Germany and selected Lingao Lighthouse, China, as the 2025 Heritage Lighthouse of the Year. The council approved most of the liaison notes, but the input paper on the development of the procedures and requirements for the recognition of the augmentation systems within WWRNS through NCSR was not approved because of the limited time given to the council approval.

The new Council's first session, held on the last day of the General Assembly on 21 February 2025 in Singapore, focused on strategy and operational direction. The Council approved the 2025 – 2027 Work programme, committee working arrangements, and the appointment of committee chairs and vice-chairs.

Minsu Jeon congratulated Hideki Noguchi and Dennis Khoo for their appointments as Chair and Vice-Chair of the DTEC committee.

Omar Frits Eriksson, Deputy Secretary-General, noted that the approval of the liaison paper to the IMO was delayed due to the need for further consultation, particularly among European stakeholders. To address this, a small working group is being established to develop a straightforward procedure for future approvals. While the process is challenging, the June Council meeting is expected to provide a structured and agreed-upon approach, ensuring smoother decision-making for moving forward.

##### 3.1.3 IALA Policy Advisory Panel (PAP)

Minsu Jeon reported on the 56th session of the PAP held from 4 to 6 February this year, referenced to the input paper DTEC4-3.1.3. The session focused on strengthening committee cooperation, advancing digitalization and addressing key policies and technical developments. Discussions included IALA's growing involvement in the Green Corridor initiative for sustainable maritime navigation, ongoing work on the Maritime Connectivity Platform and S-100 framework and advancements in digitalization and interoperability. Technical discussions covered AIS documentation, digitalization of waterways and improvements to S-200 products. Upcoming events were noted, including the Sustainability Workshop in Dublin, Ireland, in October 2025, the IMT Workshop in

Germany in September 2025, and a workshop on future radio navigation and communication systems to be held in 2026. The PAP also reviewed committee processes, enhancements to the online task tool and coordination on policy matters.

Additionally, the PAP decided to develop MASS recommendations and guidelines. Work on the holistic MASS guideline is paused until the recommendation is fully developed. Submitted MASS documents will be uploaded to a specific file share folder for future use.

Jin Hyoung Park, WG1 acting chair, highlighted the result of DTEC3's deletion of the task on the development of a new S-230 Application Specific Message (ASM) product specifications for disaster management from the IALA domain and the necessity of keeping this task for the ARM committee to represent IALA in IHO regarding the S-200 topic.

Stefan Pielmeier, WG3 chair, mentioned that the ongoing back-and-forth has not led to clear progress over the past two years. Instead of continuing this cycle, a collaborative workshop involving ARM, DTEC WG1, and 3 should be organized to define objectives and find solutions. The core issue seems to be a lack of shared understanding, and open discussions will help clarify what needs to be achieved.

Jillian Carson-Jackson, WG2 chair, noted ongoing challenges in inter-committee collaboration, particularly regarding attendance at inter-sessional meetings and delays in key discussions, such as MASS and digitalization. The current approach may not effectively engage stakeholders, leading to setbacks in guideline development. Additionally, clarity is needed on obtaining input from IALA to IMO and whether similar difficulties extend to ITU. Further guidance on these issues would help streamline progress and improve coordination.

Omar Frits Eriksson concluded that the long-standing communication issue between committees has become more urgent, and immediate improvements are necessary. The discussion at the next PAP meeting will be crucial in identifying effective solutions. Regarding ITU, approval delays are expected due to its UN affiliation, highlighting the need for more assertive national committee representation. Additionally, the recent PAP meeting focused on the Maritime Connectivity Platform, leading to the endorsement of two reference implementations for interoperability testing. Members are encouraged to use these interfaces to enhance system compatibility.

Regarding S-230 ASM Product Specifications, Minsu Jeon added that an inter-sessional, inter-committee task group is being established, with DTEC and ARM invited to participate. The Secretariat organises participant details, and interested members should reach out soon. While there has been frustration with the ongoing back-and-forth, this final discussion with ARM aims to resolve key issues. The Chair and Vice-Chair are also expected to attend, ensuring focused progress on S-230 matters.

Jillian Carson-Jackson, WG2 chair, highlighted the finalization of the MarCom Manual as a significant achievement, though it remains a living document. Updates will be managed through Working Group 2, with a structured review process, particularly for Table 2, which tracks evolving technologies. A comments form is available on the file share for continuous feedback, and the manual will be updated at least annually. Both hard copies and an online version (M0004) were maintained. She appreciated everyone involved, especially the Task Leader, for their contributions.

#### 3.1.4 WWA updates

Jaime Alvarez, Technical officer of IALA WWA, reported that the World-Wide Academy continues to advance IALA's Goal 2 by supporting coastal states in building capacity through education, training, and research. Recent efforts include training programs in Indonesia, India, France, the UK, and Italy, with a strong focus on Spanish-speaking countries through regional seminars. In 2025, courses will expand to China, Morocco, Suriname, and Colombia, among others. Increased demand for the AtoN Master Course highlights growing expertise in the field. Key training events, including a risk management course in Spain, will further strengthen global navigation capabilities.

Deputy Secretar-General added that Vincent Denamur, a highly qualified counsellor, obtained the position of WWA Dean. To provide strategic guidance, the Academy Advisory Board has been refreshed with new expert members, including a Japanese admiral and the President of the World Maritime University. The S-200 course saw moderate interest, indicating a need to reassess its focus and accelerate progress in developing technical infrastructure. The Academy and Secretariat remain committed to driving forward these initiatives to ensure meaningful advancements in training and capacity building.

### 3.2 Digital@Sea

Minsu Jeon reported that the Digital@Sea initiative has continued to progress since its transition from e-navigation in 2020. In 2023, two major conferences were held—one in North America and another in South Korea.

Mr. Hong from the Ministry of Oceans and Fisheries of South Korea, a longstanding participant, introduced the Digital@Sea conference for 2025, ensuring the initiative's continued development and engagement on a global scale. He mentioned the success of South Korea's e-navigation service launch in 2021, highlighting the importance of global harmonization and collaboration in maritime digitalization. The industry is progressing rapidly with initiatives like the S-100 standard, IMO resolutions, and ongoing discussions on communication frameworks. The upcoming Digital Asia-Pacific Conference on October 21–22 will focus on establishing a communication framework, including IP-based S-100 access, the Maritime Connectivity Platform, and SECOM. All stakeholders are encouraged to participate, share insights, and contribute to the future of maritime digitalization through cooperation and harmonization.

### 3.3 IHO

Minsu Jeon reported on recent activities with the IHO. IALA continues to cooperate with IHO on the portrayal of navigation features, terms and definitions, the IHO registry and S-124, S-125, S-201 and S-200 testbeds and trials. IALA participates in the Hydrographic Services and Standards Committee, the IHO Data Quality Working Group and the IHO S-100 Working Group. IALA contributes to the development of S-200 product specifications in collaboration with international organizations and IHO committees. It is also involved in creating testing and validation tools and providing training. In March 2025, IALA conducted S-200 training and a testbed in Korea, led by the ARM Committee, as part of its ongoing work on IHO matters.

### 3.4 IMO

Minsu Jeon provided a report on the 109<sup>th</sup> session of the IMO MSC, which was held from 2-6 December 2024 at IMO Headquarters in London. The discussions focused on autonomous ships, regulation, digitalization and navigation, and maritime safety improvements. As the key outcomes and IALA's contributions, a major topic was the development of the MASS code to the committee, updating the roadmap and ensuring the safe integration of MASS.

IALA co-sponsored the documents MSC 109-19-3, supporting the development of the S-100 active data distribution and connectivity. MSC 109 agreed to finalize guidance on this by 2026, with a potential SOLAS amendment to follow. As safety and risk management of the S-100 active data distribution and connectivity, IALA agreed to finalize guidance by 2026 with a potential SOLAS amendment to follow.

Hideki Noguchi added that with the MSC's approval of the new work agenda for the NCSR Subcommittee, it is crucial to begin preparations for both IP-based connectivity for S-100 ECDIS and the digitalization of VHF voice communication. While NCSR 12 may be too late to initiate substantial contributions, there is an opportunity to prepare for NCSR 13 next year, with DTEC5 as a key preliminary work platform. Additionally, ITU has already made significant progress on digital voice communication, with only the final agreement on the coding remaining. WG 1 and WG3 are encouraged to consider their roles in these initiatives and explore potential contributions.

### 3.5 ITU

Stefan Bober provided an update on the ITU-R WP5B meeting, which took place from 19 to 28 November 2024. The meeting made significant progress on multiple issues, including the revision of Recommendation ITU-R M.2092-1, which is on track for completion by the end of the year. The new digital voice recommendation received positive feedback, though further work is needed.

Additionally, study questions on VHF data exchange system coexistence with R-mode and digital voice introduction in maritime VHF channels have been approved and will continue to be addressed. Ongoing reports on VDES R-mode and digital voice are also being developed. Lastly, the issue of manufacturer ID availability is nearing resolution, and discussions on IMT-2030 and e-navigation are progressing, with further input invited.

### 3.6 IEC

Stefan Bobber reported that IEC continues developing CVDS standards, particularly ISC 63514, Edition 1. The work is expected to be completed by ISC Web Group 15 by the end of this year, with the publication and approval process anticipated to take approximately one year. As a result, the final international standard is projected to be available by late 2026 or early 2027.

Additionally, ISC Maintenance Team 7 is actively reviewing the standards, with a particular focus on the route exchange issue. A liaison note has been sent to JALA, and the VTS Committee has already been working on this matter. IEC expects a liaison response from JALA within this year to finalize the work. Given the tight timeline, there is some pressure, but overall, progress is moving in a positive direction.

### 3.7 ISO

Minsu Jeon reported on the ISO matters. IALA actively participated in the ISO-TC8 Subcommittee 11 (SC11) on Intermodal and Short-Sea Shipping. In November 2023, the International Association of Navigation Aids (IANA) and ISO established an official collaboration framework to enhance standardization efforts.

SC11 is responsible for developing technical standards related to administrative, operational, and logical data to improve efficiency and interoperability in maritime transport. To further support this work, an event will be held in May 2024 in Valencia to discuss these topics in greater detail.

### 3.8 ISO-IEC JTC 1

Jin Hyoung Park reported on ISO-IEC Joint Technical Committee 1. The ISO-IEC Joint Technical Committee 1, SD-41, which focuses on IoT and digital twin applications, has made significant progress in standardization efforts. At the November 2024 plenary meeting in Wuxi, five active working groups (WG3 to WG7) led discussions on key areas such as interoperability, applications, and maritime systems.

Key developments from the meeting include:

- Approval of new work items
- Creation of an ad-hoc group for conformance assessment and quality assurance in IoT and digital twins
- Updates to digital twin reference architectures and interoperability frameworks
- Review of environmental concerns in underwater communication systems
- Growing global collaboration with ISO, IEC, and JTC-1, including the formation of new joint working groups
- Emerging topics such as data spaces and sensor virtualization

With SD-41 expanding its influence across multiple industries, maritime IoT and digital twin technologies present valuable opportunities for ILO applications. Jin Hyoung Park proposed that IALA members actively participate in SD-41, particularly in Working Group 7, to leverage these technologies for maritime advancements.

IALA members interested in SD-41 activities are encouraged to contact Jin Hyoung Park for further details.

### 3.9 RTCM

Ross Norsworthy, a participant from the US Coast Guard, reported on RTCM Activities and the Upcoming Meeting. The RTCM extends its gratitude to all participants of our annual meeting in May last year. He announced that our next annual meeting will take place at the end of April or May, where key developments and ongoing initiatives will be discussed.

A significant highlight is the progress of Special Committee 139, chaired by Stefan Pielmeier, who has been actively working on developing a Maritime Messaging System Standard. He mentioned that this initiative has resulted in establishing an official standard, marking a major achievement for the committee.

### 3.10 3GPP

Hyunhee Koo (3GPP representative at SyncTechno Inc.) provided the 3GPP update on three agenda items: 3GPP timeline, public warning service (PWS) via satellite integrated with LTE and 5G, and the study on ultra-low bitrate speech codec.

Regarding the 3GPP timeline for 5G-Advanced to 6G standardization, which remains unchanged since it was reported at the DTEC3 meeting, she noted that 3GPP plans to begin reviewing the 6G standardization status at the end of 2025 to update the 6G timeline.

In addition, she reminded the group of the current AS-IS status of PWS support in commercial IMT networks, noting that further details can be found in her presentation at the IALA Conference 2023 in Brazil. Within the 3GPP standardization framework, stage 2 and stage 3 work is ongoing to support PWS over satellites integrated with LTE and 5G networks—raising the question: “How can PWS be employed for Marine AtoN via satellite LTE and 5G?” She emphasized that the answer to this question depends on regional and global regulatory policies and requirements applicable to the maritime sector.

Finally, Hyunhee Koo noted that 3GPP has been exploring voice calls using GEO satellites and that 3GPP TSG SA plenary approved a new study on ultra-low bitrate speech codec two weeks ago. She provided the objective of the study, which focuses on developing a codec for voice calls using GEO satellites. She invited all relevant participants of the IALA DTEC4 committee to join that session, as further discussion will continue during the IMT-2030 Task Group session in WG2 this week.

### 3.11 VDES Alliance

Stefan Pielmeier, Chair of WG3, provided an update on VDES Alliance. He noted that the VDES Alliance remains active and thriving, welcoming new participants interested in contributing to its initiatives. The working groups continue to make progress, with a newly established group focusing on use cases and promotional strategies for VDES, as well as developing an integration test guideline between MMS and VDES. While not a standard, this guideline provides a framework for assessing compatibility between systems. Additionally, a live demonstration of these test cases was planned during DTEC4 Physiafl week, offering valuable insights into our ongoing work. For more information, participants were invited to visit the VDES alliance website or reach out directly.

## 4. PRESENTATIONS

All presentations given at DTEC4 can be found on the [fileshare](#). The following presentations were given at DTEC4:

- Open digital incubator (AMSA, KRISO, AIVeNautics, GMT)
- SAT VDES (Maritime and Port Authority of Singapore – MPA)
- Field Trial on VHF Digital Voice Communication (Japan Coast Guard)

- VDES sea trials (FURUNO ELECTRIC CO., LTD.)
- Tackling Maritime Operations through Digitalisation (MPA)
- IMT Workshop (Jan-Hendrik Oltmann)

During the physical week, additional presentations on MMS, VDES, and the Maritime Connectivity Platform were given in WG3.

The DTEC dashboard contains recordings of the presentations and the results of the internal analysis conducted during the session.

## 5. WORK PROGRAMME MANAGEMENT

### 5.1 Work Programme 2025 – 2027, Task Plan, Task Register

The DTEC Committee Management Team updated the Task plan before the DTEC4 session. The Chair and Vice-Chair updated the Task Plan and Task Register using the online task tool, and the committee noted these. The current status of tasks can be found [here](#).

### 5.2 Action Plan for DTEC4

The [DTEC4 Action Plan](#), which can be found on the IALA Dashboard for DTEC, was noted by the Committee Secretary.

## 6. REVIEW OF INPUT PAPERS

The input papers for DTEC4 consisted of new input papers as well as working papers from the previous session. The input paper list (DTEC4-6.0.1) includes the working papers from DTEC3.

Input papers were numbered in line with the agenda and allocated to the relevant Working Group. The late input papers were referred to the participant's attention and are highlighted in green in the list of input papers.

## 7. ESTABLISH WORKING GROUPS

The Chair outlined the procedure to be followed by working groups, after which three working groups were established and their tasks outlined. The Working Group chairs and vice-chairs were introduced. Full lists of working group participants can be found in Annex F.

Working Group (WG)	Working Group Chair / Vice-Chair
WG1 – Digital Information Systems	Jin Hyoung Park (acting) / Julius Moeller (acting)
WG2 – Emerging Digital Technologies	Jillian Carson-Jackson / Dennis Khoo
WG3 – Digital Communication Systems	Stefan Pielmeier / Stefan Bober

## 8. WORKING GROUP 1 – DIGITAL INFORMATION SYSTEM (WG1)

During the 4<sup>th</sup> session of the DTEC committee, the WG1 – Digital Information Systems worked on the areas of disaster management, MRN, MCP specifications, SECOM and liaison notes to IEC were drafted.

The Chair and Vice-Chair of the Working Group thanked all participants, both in person and online for their hard work during the session.

Close to 22 individual participants attended one or more task group meetings formed under Working Group 1 - Digital Information Systems (WG1) during DTEC4.

The Work Plan was introduced, reviewed, and adopted by WG1. Additionally, the WG reviewed the DTEC WG1 task register. As part of the review, tasks DTEC-1.4.3 and DTEC-7.2.2 were deleted, DTEC-7.1.3 was transferred to WG2, and DTEC-6.1.1 was assigned to the ARM committee.

Throughout the physical session of the week, the WG focused on the following tasks:

- Task 7.1.5 Review G1128 Specification of e-Navigation technical services (SECOM Service Specification).
- Task 7.1.6 Development of MCP-related IALA documents (MCP and related matters).
- Task 7.2.1 Contribute to the standardisation efforts with respect to the requirements of the S-100 domain experts:
  - ✓ Task 7.2.1 a) Task on Maritime Resource Names (MRN);
  - ✓ Task 7.2.1 b) Service Design for VTS Traffic Clearance;
  - ✓ Task 7.2.1 c) Task on Service Design Technical service for AtoN.
- Task 7.1.14 Defining IALAs Role in MCP Trust Infrastructure.
- Task 7.1.15 Consider the Development of Product Specification for Disaster Management.

#### 8.1 Task 7.1.5 Review G1128 Specification of e-Navigation technical services (SECOM Service Specification)

**Task group lead:** Juho Pitkänen, Thomas Christensen, Julius Moeller

**Referencing Document(s):**

DTEC4-6.2.0.3	Liaison note from IEC TC80-MT7 to IALA (MT7-2426)
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**Comments:**

The group discussed the liaison note from IEC and acknowledged the draft response prepared by the VTS Committee. During the discussion, it was noted that DTEC is aligned with the comments made by the VTS Committee. It was further highlighted that the use of data sets may be more appropriate than ExchangeSets in the context of bi-directional ship-to-shore data exchange. This is due to the current inability of ships to obtain S-100 Part 15 producer codes, which prevents them from signing ExchangeSets with IHO-issued digital identities. As a result, relying on ExchangeSets could present implementation challenges. DTEC had no further comments and expressed full support for the draft liaison note from IALA to IEC as prepared by the VTS Committee.

Separately, WG1 drafted two liaison notes to IEC seeking clarification on the redistribution of machine-readable data model schemas and API definitions contained in IEC 63173-1 and 63173-2. These standards are highly relevant to IALA, particularly for the implementation of technical services in the context of e-Navigation. During the discussion, the following points were raised:

- There are legal uncertainties for IALA members when sharing service implementations and detailed specifications publicly, as the schemas referenced above are available via the CIRM website but are not accompanied by any licensing terms.
- Enabling the use of these files in open-source projects would be highly beneficial, as it would support broader adoption of the standards and facilitate the cost-effective development of digital maritime services.

**Output:**

DTEC4-15.2.2	Liaison note to IEC on SECOM OpenAPI specification
DTEC4-15.2.3	Liaison note to IEC on S-421 schema

**Action item(s):**

The **Secretariat** is requested to forward the Liaison note to IEC on SECOM OpenAPI specification (DTEC4-15.2.2) and Liaison note to IEC on S-421 schema (DTEC4-15.2.3) to the Council for approval.

**8.2 Task 7.1.6 Development of MCP-related IALA documents (MCP and related matters)**

**Task Group Leader:** Ramin Miraftabi, Thomas Christensen

**Referencing Document(s):**

DTEC4-6.2.1.1	Input paper on MSR
DTEC4-6.2.1.1.1	Draft Guideline on MSR
DTEC4-6.2.1.2	Information paper on the trust system of MCP
DTEC4-6.2.0.14	Input paper on RTCM SC139 standard
DTEC4-6.2.0.14.1	Annex RTCM standard 13900.0

**Comments:**

The working group continued its work on the guideline for the MCP Maritime Service Registry (MSR) and finalised the draft.

During the development of the MSR guideline, it was identified that a revision to Guideline G1128 is necessary, as the MSR contains information about service instances described in G1128. The working group therefore also made consequential changes to the relevant sections of G1128 to be aligned with the new MSR guideline.

The working group organized a joint session with WG 3 for demonstrating the up-to-date development of MMS including RTCM SC139 standard. During the session, overall contents of the MMS standard were explained and delivery of service, such as NW and MPA, via MMS over IP and VDES were demonstrated.

In addition, the group reviewed and discussed an information paper on a decentralised trust system, which led to broader discussion about a potential extended role for IALA in the context of MCP.

Finally, a vision for IALA's role in the certification of MCP instances was presented and discussed. It was agreed that the relevant task group should, during DTEC5, finalise a proposal outlining such an extension of IALA's role. Specifically, this could include IALA endorsing operational MCP instances and maintaining mechanisms to identify and authenticate them – similar to the role currently fulfilled by the MCP Consortium (see IALA G1183), and possibly in a second stage, to setup an operational MCP.

A new task (DTEC-7.1.14) was created to track progress on this work.

Input papers on these topics are encouraged for DTEC5.

**Output:**

DTEC4-15.2.4	GXXXX Maritime Service Registry Technical Specification
DTEC4-15.2.5	G1128 Ed1.7 Specification of e-Navigation Technical Services

### Action item(s):

The **Secretariat** is requested to forward the revised Guideline G1128 on Specification of e-Navigation Technical Services (DTEC4-15.2.4) to the Council for approval.

The **Secretariat** is requested to forward the new draft Guideline on the Maritime Service Registry (DTEC4-15.2.5) to the Council for approval.

The **Secretariat** is requested to publish the additional files (MSR OpenAPI.json, searcharea. geojson for the MSR guideline / ServiceInstanceSchema.xsd ) of the guideline G1128 on the IALA website.

**Committee participants** are invited to submit input papers on the development of guidance on the MCP's decentralised trust system.

**Committee participants** are invited to submit input papers addressing IALA's potential role in establishing a certification scheme for MCP instances, as well as strategies for providing an operational instance of the MCP.

## 8.3 Task 7.2.1 Contribute to the standardization efforts with respect of the requirements of the S-100 domain experts

### 8.3.1 Task 7.2.1 a) Task on Maritime Resource Names (MRN)

**Task Group Leader:** Rasmus Madsen Jensen

#### Document(s):

ARM19-11.3.4	Liaison note to PAP and all committees on MRN inter-sessional work
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#### Comments:

The group discussed the internal responsibilities within IALA regarding the Maritime Resource Names (MRN). After some deliberation, it was agreed that the current allocation of responsibilities within IALA concerning MRN is unclear. The group proposed that the overarching responsibility for MRN should lie with DTEC, while individual committees should be responsible for its application, usage, and structural aspects within their respective domains (e.g. ARM for MRN use in the context of Aids to Navigation). It was further noted that the use cases for MRN are not limited to Aids to Navigation but extend to a wide range of technical applications across S-100, the Maritime Connectivity Platform (MCP), database management, and maritime services. Given this broad technical relevance, it was considered appropriate for overall responsibility to reside with DTEC. This division of responsibility should be reflected in the existing overarching MRN guideline.

It was suggested that each committee could benefit from developing an MRN guideline specific to its domain or contributing dedicated annexes to the existing MRN documentation. The group also recommended that this issue be raised within PAP for further consideration.

In addition, the group discussed a liaison note from ARM, which proposed the establishment of an inter-committee intersessional task group to review MRN guidance and support the development of an IMO Circular to inform IMO Member States about MRN. A draft liaison note was prepared to support the creation of such a group, including additional suggestions for its terms of reference.

#### Output:

DTEC4-15.2.1	Liaison note to ARM on MRN intersessional work
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### Action item(s):

The **Secretariat** is requested to forward the Liaison note on MRN inter-sessional work (DTEC-15.2.1) to the next session of the ARM committee.

**Committee participants** interested in participating in the intersessional inter-committee meeting should contact Rasmus Madsen Jensen ([rmj@dma.dk](mailto:rmj@dma.dk)).

**The committee chair** is requested to raise the issue of responsibilities for the development of MRN guidance in the next session of PAP.

#### 8.3.2 Task 7.2.1 b) Service Design for VTS Traffic Clearance

##### Comments:

This task group was initially established under the VTS Committee with support from DTEC. Work has since progressed within the VTS Committee, resulting in the development of a version 1.x technical service specification. As the task group's activities are now fully embedded within the VTS Committee, it is no longer necessary for it to be listed under DTEC. It will, therefore, continue its work solely as a VTS task group.

#### 8.3.3 Task 7.2.1 c) Task on Service Design Technical service for AtoN.

##### Comments:

Similar to the task group on traffic clearance, a version 1.x technical service specification has been developed, and there is no longer a need for DTEC's involvement. The work will continue under the responsibility of the ARM Committee.

### 8.4 Task 7.1.15 Consider the Development of Product Specification for Disaster Management

**Task Group Leader:** CDR. Kinji TAKEUCHI, Japan Coast Guard (JCG)

##### Referencing Document(s):

DTEC4-6.2.0.5	Input PS on Disaster Management
DTEC4-6.2.0.5.1	Annex to the Input PS on Disaster Management

##### Comments:

During DTEC3, WG1 reviewed an input paper from Japan proposing the development of a new S-200 product specification for application-specific messages (ASM) related to disaster management. WG1 noted potential overlap between the proposed specification and the existing S-124 product specification for navigational warnings and requested the Japan Coast Guard (JCG) to clarify the distinctions.

In response, JCG submitted a follow-up paper to DTEC4 outlining the relationship between the proposed new product specification and S-124 and further elaborated on their use case. WG1 discussed paper DTEC4-6.2.0.5 and reached the following conclusions:

- WG1 supported the development of a new S-200 product specification focused on disaster management in general.
- The current proposal was considered too narrowly focused on JCG's national use case. JCG was asked to develop and submit a generalised operational concept suitable for international application, which could serve as the foundation for the product specification.
- It was recognised that the scope of the proposed work overlaps with certain responsibilities of the VTS Committee. As such, JCG was encouraged to also submit an input paper to the next VTS Committee session to inform them about the progress on this task.
- A new task (DTEC-7.1.15) was created to track progress on this work.

##### Output:

New Task DTEC-7.1.15

### Action item(s):

**Japan Coast Guard** is requested to submit an input paper to DTEC5 to clarify the operational concept for the proposed new S-200 product specification on disaster management.

**Committee participants** interested in the task DTEC-7.1.15, are requested to contact Cdr Kinji Takeuchi ([takeuchi-s98d2@mlit.go.jp](mailto:takeuchi-s98d2@mlit.go.jp)) to share their views.

## 9. WORKING GROUP 2 – EMERGING DIGITAL TECHNOLOGIES (WG2)

During the 4<sup>th</sup> session of the DTEC committee, the WG2 – Emerging Digital Technology worked on several tasks regarding emerging digital technologies.

Referencing Document(s): DTEC 04– WG2 Schedule-vs1.pdf

The proposed working schedule was introduced, reviewed and adopted by the WG.

The Chair and Vice-Chair of the Working Group thanked all participants, both in person and online for their hard work during the session. They noted the ongoing success of the hybrid working environment.

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

- Task 1.2.1 – Develop guidance for IALA members on going from development test bed/ trial reporting to implementation.
- Task 1.2.4 – Develop guidance on the provision of Marine AtoN for autonomous vehicle/vessel operations (Maritime Autonomous Surface Ship, MASS).
- Task 6.2.1 – Contribute to the development of IMT-2030 by formulating user requirements for Marine AtoN.
- Task 6.3.14 – Develop a manual on maritime communications (MARCOM Manual) (carried over from 2018-2023 work programme).
- Task 7.1.1 – Develop a discussion paper on digitalisation in the scope of IALA.
- Task 7.1.2 – Develop a guideline on the developments and implementation of the digitalisation of waterways.
- Task 7.2.1 – Consider guidance on the implementation of S-100 from AtoN Authority Perspective.
- Task 8.3.1 – Review of new / candidate technologies for use in the IALA domain.

### 9.1 Task 1.2.1 Develop guidance for IALA members on going from development test bed/ trial reporting to implementation

**Task group leader:** Ernest Batty

**Input papers:**

DTEC3	11.2.2.10	Draft Guideline on Innovation to Implementation (forwarded from DTEC3)
DTEC4	---	For DTEC4-DraftGuideline-Innovation to implementation_01.docx

#### Comments:

This task was commenced at DTEC2 with a review of different approaches to taking innovation solutions from test bed to implementation. Based on the results of the discussion, the task group leader developed an initial draft guideline that was reviewed and developed at DTEC3. Document development continued at DTEC4.

#### Key outcomes include:

The draft guideline continued development, with input from the working group on several topics including the addition of non-functional requirements to be considered during innovation, as well as the need to consider vendor neutrality and the usefulness of including a RFI (Request for Information) process before the actual procurement process by the procurement party.

A table was created to illustrate the differences between technical readiness and technology maturity. Scalability was also included as a key perspective. The working group also noted the challenges faced by innovators today on the need to purchase numerous documents on standards from various organisations which could result in substantial upfront investment costs.

#### Output:

The working document will be forwarded to DTEC5.

The task group will continue to work intersessionally through an asynchronous email discussion. Contact Ernie Batty ([ernie.b@imisglobal.com](mailto:ernie.b@imisglobal.com)) by 1 May to confirm interest in participating in the intersessional development of this document.

#### Action item(s):

**Committee participants** are invited to join the intersessional task group meeting on the development of guidance on moving from innovation to implementation Guidelines, and contact Ernest Batty ([ernie.b@imisglobal.com](mailto:ernie.b@imisglobal.com)) on or before 1st May 2025 if they plan to attend.

### 9.2 Task 1.2.4 Develop guidance on the provision of Marine AtoN for autonomous vehicle/vessel operations (Maritime Autonomous Surface Ship, MASS)

**Task group leader:** Jillian Carson-Jackson

#### Input papers:

DTEC4	6.2.2.3.3	Draft Discussion paper on MASS compatible AtoNs
DTEC4	6.2.2.3.4	Draft Liaison note DTEC to ARM on MASS compatible AtoNs
DTEC4	6.2.2.5	Recommendations for updating the cybersecurity related chapters of the MASS Guideline.docx

#### Comments:

The input papers were noted, but this item has been put on hold until after ARM has finished their review.

#### Output:

The papers will be forwarded as working documents to DTEC5.

#### Action item(s):

The **Secretariat** is requested to forward the working paper DTEC4-15.5.5 related to the development of the MASS Recommendation and MASS Guideline to DTEC5 for further review.

### 9.3 Task 6.2.1 Contribute to the development of IMT-2030 by formulating user requirements for Marine AtoN

**Task group leader:** Hyounhee Koo

**Input papers:**

DTEC4	3.10	Report of 3GPP update_submitted
DTEC4	6.2.0.1	Liasion note ITU WP5D to IALA
DTEC4	6.2.0.7	Liasion note to IALA from ITU WP5D
DTEC4	-	Draft IALA Guideline on Marine AtoN over IMT-2030
DTEC4	-	Report of ITG on IMT-2030

**Comments:**

The working group discussed the 3GPP report (3.10) in greater detail. Specifically, it was noted that IMT developments have wide ranging implications on the ongoing discussions on digitalization of waterways, MASS as well as emerging technologies such as Qualcomm’s 5G Precise Positioning. The working group proposed, recalling past presentations on CODECs such as dPMR and CODEC 2, that the inputs required for the FS-ULBC (Ultra Low Bitrate speech Codec) would more appropriately be studied and provided by WG3 or a subgroup of experts in codec.

The working group further discussed on the topics of “positioning” and “timing” as specified in the IMT-2030 Framework in Recommendation ITU-R M.2160 and noted the relationship to related work in the review of developing technologies (Qualcomm 5G-NR).

The working group discussed the different roles performed by ITU-R Working Party (WP) 5B (<https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5b/Pages/default.aspx>) and ITU-R Working Party (WP) 5D (<https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/default.aspx>). Recognising the excellent, and ongoing, participation of IALA at WP 5B, the meeting agreed that there could be scope for IALA, as an IGO, to provide appropriate guidance to member states to encourage their respective telecommunications authorities to raise awareness of the maritime use cases within IMT-2020 and IMT-2030 technologies to support discussion at future ITU-R WP5D and/or ITU-R WP5B.

**Output:**

No output paper for this task. The draft IALA Guideline on Marine AtoN over IMT-2030 will be forwarded to DTEC5.

Related to the development of the Guideline, the past work on a draft recommendation related to the use of IMT technologies will continue to be progressed.

The task group will continue to work in asynchronous, email intersessional meetings through focused ‘topics’.

**Action item(s):**

**Committee participants** are invited to participate in the intersessional task group asynchronous meeting on the development of use cases for maritime in IMT-2030 and contact Hyounhee Koo ([koo@synctechno.com](mailto:koo@synctechno.com)) on or before 1st May 2025 if they plan to attend.

**IALA Member States** are encouraged to communicate with their delegates participating ITU-R Working Party 5D (WP5D) regarding their national maritime use cases for use of the IMT technologies.

The **Secretariat** is requested to forward the draft Guideline on Marine AtoN of IMT-2030 (DTEC4-15.5.2) to DTEC5 for further review.

#### 9.4 Task 6.3.14 Develop a manual on maritime communications (MARCOM Manual) (carried over from 2018-2023 work programme)

**Task group leader:** Ernest Batty / Jillian Carson-Jackson

**Input papers:** NIL

**Comments:**

This work task was completed at DTEC3, and the MARCOM manual has been made available in print during DTEC4.

**Key outcomes include:**

The MARCOM Manual was officially launched at DTEC4. As this would be a living document, a "Feedback Form" has been developed for IALA members to provide comments and suggestions to further improve and update the MARCOM Manual as and when needed.

**Output:**

This form is located on the IALA File Share under Committees / ENAV-DTEC / ENAV-DTEC-WG2-Reference / MARCOM Manual Comments.

**Action item(s):**

*The **Secretariat** is requested to publish the digital version of the MARCOM manual on the IALA website.*

***IALA Members** are asked to review the MARCOM Manual and provide comments, corrections, additions as appropriate using the MARCOM Manual Comment Form located on the IALA File Share.*

#### 9.5 Task 7.1.1 Develop a discussion paper on digitalisation in the scope of IALA

**Task group leader:** Nicholas Chiew

**Input papers:**

DTEC4	6.2.2.7	Input Paper on Progress Update for Task on Developing a Discussion Paper on Digitalisation in the Scope of IALA
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**Comments:**

The Task Group Leader presented the input paper DTEC4-6.2.2.7.

The working group reviewed the progress updates from the intersessional meeting held in December 2024 and continues to make good progress at DTEC4. The task remains on track for completion.

At DTEC4, the working group continued its work on the draft discussion paper and agreed on its preliminary content that includes Section 1, "Digitalisation in Sea Transportation & Shipping"; Section 2, "IALA's Vision for Digitalisation in Waterways and Shipping"; and Section 3, "IALA Emerging Digital Technologies Development Roadmap." This will be the baseline for the Task group's discussion paper draft. There were other several great inputs noted during the discussions including:

- Recognising the need to elicit inputs from various IALA committees including ARM, VTS, ENG and PAP
- Positioning the paper as a living document, to be updated in response to emerging digital technologies.
- Considering the inclusion of roadmaps for Maritime Services, Internet of Things, and Artificial Intelligence technologies

**Key outcomes include:**

The task group will continue to work in intersessional meetings before DTEC5 The intersessional meeting schedule will be published on the IALA DTEC Committee Dashboard and on the IALA Fileshare. The meeting will be held on:

- 28 August 2025, from 09:00 to 10:30 UTC.

A liaison note on the Digitalisation in the Scope of IALA (DTEC4-15.3.5) was agreed to be forwarded to ARM, VTS, ENG and PAP.

#### **Action item(s):**

The **Secretariat** is requested to forward a Liaison note on the Digitalisation in the Scope of IALA (DTEC4-15.3.5) to ARM, VTS, ENG and PAP.

**Committee participants** are invited to join the intersessional task group meeting on the Discussion Paper on Digitalisation in the Scope of IALA and contact Nicholas Chiew ([Nicholas\\_chiew@mpa.gov.sg](mailto:Nicholas_chiew@mpa.gov.sg)) on or before 14 August 2025 if they plan to attend.

The **Secretariat** is requested to forward the working paper on Developing a Discussion Paper on Digitalisation in the Scope of IALA (DTEC4-15.5.6) to DTEC5 for further review.

### **9.6 Task 7.1.2 Develop a guideline on the developments and implementation of the digitalisation of waterways**

**Task group leader:** Kaisu Heikonen

#### **Input papers:**

DTEC4	6.2.2.1	Liaison note ENG to DTEC committee on digitalisation of waterways guideline
DTEC4	6.2.2.3	Report on Task 7.1.2 Digitalization of waterways
DTEC4	6.2.2.3.1	Draft Guideline on Digitalization of waterways_post intersessional_v1.0
DTEC4	6.2.2.3.2	Draft Guideline on Digitalization of waterways_post intersessional_clean_v2.0
DTEC4	6.2.2.3.3	Draft Discussion paper on MASS compatible AtoNs
DTEC4	6.2.2.3.4	Draft Liaison note DTEC to ARM on MASS compatible AtoNs
DTEC4	6.2.2.4	Proposal on further improving the content of digital waterway guideline
DTEC4	6.2.2.4.1	Annex Draft IALA Guideline on digitalization of waterways
DTEC4	6.2.2.11	Liaison note to PAP and DTEC on Digitalisation of Waterways
DTEC4	6.2.2.12	Liaison Note to DTEC on digitalization of waterways

#### **Comments:**

The input papers were noted by the working group.

The DTEC committee recognised the valuable feedback received.

The draft guideline was progressed during DTEC 4, with reference to the task objective as stated on the IALA Workplan and DTEC Task Register. This included recalling:

- The name of the draft Guideline had been modified and agreed at DTEC1 to make it more inclusive. Waterway is general term which includes fairways, channels, and other navigable waters. However, it was noted that IALA dictionary does not currently give definition to either of the term's waterway or fairway.
- The relationship between this task and DTEC 7.1.1 - Develop a discussion paper on digitalisation in the scope of IALA is drafting a high-level discussion paper. Task 7.1.1 is the development of a living document, outlining IALA's vision for the digitalization of waterways and shipping.

### Key outcomes include:

DTEC committee plans to continue drafting intersessionally and send an updated version of the draft new Guideline on Digitalization of Waterways to other technical committees for review and comments after its next meeting, DTEC5.

The intersessional meeting is scheduled for schedule will be published on the IALA DTEC Committee Dashboard and on the IALA Fileshare. The meetings will be held on:

- 5 June 2025 – 0900-1000 UTC
- 21 August 2025 – 0900-1000 UTC

An inter-committee intersessional meeting is planned for 6 Nov. 2025 0900-1030 UTC. This date was identified to be following the next meeting of the IALA VTS Committee, noting the comments in the liaison note from VTS57.

### Output:

Output documents were developed and reviewed:

1. DTEC4-15.3.6 – Liaison note on the Digitalisation of Waterways (for forwarding to VTS Committee)
2. DTEC4-15.3.3 – Liaison note on AtoNs specifically designed to support autonomous navigation, with a copy of the draft discussion paper and the IALA conference paper on the topic) (for forwarding to ARM Committee)

### Action item(s):

**Committee participants** are invited to join the intersessional task group meeting on Digitalisation of Waterways and contact Kaisu Heikonen ([kaisu.heikonen@ftia.fi](mailto:kaisu.heikonen@ftia.fi)) on or before 1st May 2025 if they plan to attend.

The **Secretariat** is requested to forward a Liaison note on the Digitalisation of Waterways (DTEC4-15.3.6) to the VTS Committee.

The **Secretariat** is requested to forward a Liaison note on AtoNs specifically designed to support autonomous navigation (DTEC4-15.3.3) to the ARM Committee.

**VTS members** are encouraged to consider attending the online inter-committee drafting meeting to be held 6 Nov. 2025 from 0900-1030 UTC.

The **Secretariat** is requested to forward the working paper on developing guidance for the digitalization of waterways (DTEC4-15.5.7) to DTEC5 for further review.

## 9.7 Task 7.2.1 S-100 World from a Marine AtoN Authority perspective

**Task group leader:** Jan-Hendrik Oltmann

### Input papers:

DTEC4	6.2.0.11	Input paper on the IMT Workshop
DTEC4		Presentation on IMT Workshop
DTEC3		Working Paper – IALA S-100 from an Authority Perspective

### Comments:

The input papers and presentation were noted.

Reference was made to the presentation held during opening plenary on the preparation for the IMT workshop, to be held 1-5 Sept in Karlsruhe Germany.

DTEC has recognised the urgent need for guidance to IALA members regarding the ongoing development of S-100 data products to support the transfer of information within maritime services.

DTEC 4 discussed S-100 in light of the recent developments at IMO to realize the full potential of the S-100 based ECDIS (MSC109/19/3).

In particular, the impact on AtoN Authorities and the consequential work required to meet the emerging IMO requirements in a structured approach was discussed. This included the use of generic architectural terms defined in a 'Services-Data-Connectivity stack'.

- The **Services** domain would include the 'Maritime Services in the context of e-navigation' (IMO MSC.1/Circ.1610Rev1, 2024, refers)
- The **Data** domain would include the S-100 world defined data
- The **Connectivity** domain would provide the necessary data messaging means for shore-to-ship/ship-to-shore data exchanges.

The working group noted that IMO MSC 109 agreed to become an associated organ of the development of a comprehensive strategy on maritime digitalization led by the Facilitation Committee (FAL). IMO MSC 109 also agreed to the development of guidance for a framework to support IP based connectivity between shore-based facilities and ships.

DTEC is aware of similar work in the ARM Committee, and in other committees. To avoid duplication of effort, and to build on the work already carried out on these matters, a liaison note was prepared (DTEC4-15.3.4). To progress this topic it is proposed that an asynchronous e-mail correspondence group be commenced. Those who are interested in participating in this correspondence group are asked to contact Mr. Jan-Hendrik Oltmann [Jan-Hendrik.Oltmann@wsv.bund.de](mailto:Jan-Hendrik.Oltmann@wsv.bund.de) by 30 April 2025.

#### Action item(s):

**Committee participants** are invited to join the email correspondence group meeting on S-100 World from a Marine AtoN Authority perspective and contact Jan-Hendrik Oltmann ([Jan-hendrik.oltmann@wsv.bund.de](mailto:Jan-hendrik.oltmann@wsv.bund.de)) on or before 30th April 2025 if they plan to attend.

The **Secretariat** is requested to forward a Liaison note on S-100 Aton Authority Perspective (DTEC4-15.3.4) to ARM and PAP.

### 9.8 Task 8.3.1 Review of new / candidate technologies for use in the IALA domain (ongoing task, includes a review of IALA G1153)

**Task group leader:** Jillian Carson-Jackson

#### Input papers:

DTEC4	6.2.2.8	Additional Notes of the Metal Surface Wave Technology (MS@MS)
DTEC4	6.2.2.9	Additional Review of Radio-free wireless communication based on Metal Surface Wave in the maritime sector
DTEC4	6.2.0.2	Review of IALA G1153 Updates to the Emerging Technology Assessment Template and Internal Procedures
DTEC4	6.2.2.2	Proposal for Developing a Guideline for Exchanging GNSS Interference Data
DTEC4	-	G1178 Ed1.0 An introduction to the Artificial Intelligence (AI) from an IALA perspective

DTEC4	-	G1179 Ed1.0 An introduction to the Internet of Things from an IALA perspective
DTEC4	6.2.2.13	Liaison note to all Committees on Development of IoT Guidance (ARM19-11.2.2)

#### Comments:

Input papers DTEC4-6.2.0.2, DTEC4-6.2.2.2, DTEC4-6.2.2.8, DTEC4-6.2.2.9 and DTEC4-6.2.2.13 were reviewed. In addition, G1178 and G1179 were considered.

DTEC4 focused on completing reviews of technologies previously presented as well as reviewing two new technologies as presented during the meeting. In addition, the feedback from LAP on G1153 was reviewed and addressed.

The summary note of new technologies was updated, and all updated G1153 reviews were placed on the IALA file share under the parent folder 'Committees' in the sub folder 'Technology Reviews – Summary and Folders'.

#### 9.8.1 Review of the Metal Surface Wave Technology (MS@MS)

Input Papers: DTEC4-6.2.2.8 and DTEC4-6.2.2.9

It was noted that The Metal Surface Wave Technology (MS@MS) was initially presented at ENAV 30. MS@MS was reviewed using the G1153 template at ENAV-EM1 and the review was completed at DTEC1. And DTEC1 WG2, through DTEC1-12.3.3.2, requests IALA members to conduct tests for implementation of MS@MS technology and to present results of trial.

During DTEC3, the input paper presented the results of trials for Radio-free wireless communication based on the Metal Surface Wave (MS@MS) on a coastal passenger ship ('Jagalchi Cruise') to confirm the communication performance ('Latency, Network Band Width, Packet Loss Rate'). The results were demonstrated at DTEC3 and are summarized in input paper DTEC3-5.2.2.5. Further testing will be conducted to confirm operation of various sensors to implement an IoT communication system based on MS@MS.

During DTEC4, WG2 completed the review of the new technology using G1153, updating previous reviews based on the presentation and results of the trials. In particular, the use of the technology in the AtoN environment, and the ability to use on curved surfaces, was note.

The issue of intellectual property rights was discussed, and the WG noted that the IP owner, KRISO, will be contacting IALA to confirm use of the technology under the IALA patent statement and licensing declaration. Option 2 indicates that *the Patent Owner is prepared to grant a license to IALA and IALA members on a worldwide, fair, reasonable and non-discriminatory basis and on reasonable terms and conditions to make, use and sell implementations of the above IALA document.*

A copy of the presentation was provided on the IALA Fileshare.

#### Action item(s):

**IALA Members** are asked to note the completion of the review of the MS@MS Technology.

#### 9.8.2 Review of Ship Air Draft Remote Measurement Technology (SADRMT)

Input paper: NA

DTEC3 discussed vessel height detection systems within the VTS (Vessel Traffic Services) environment, and WG2 members noted a largely manual process for measuring air draft, with some systems providing 'air gap' and other using the selection of top and bottom lines in CCTV images to calculate vessel heights. It was noted that automation in this process, with increased accuracy, would assist in efficiency and support safe transits under

bridges and overhead structures. The significance of accurate measurements was highlighted, particularly in ensuring safe air clearance, with possibility for alerts triggered by the system when vessels breach safety zones, in a manner similar to that currently done for the dynamic approach to under keel clearance. During DTEC3, OMC International (Australia) provided a presentation on the development of 'Bridge Clear' technology.

The work of PIANC (specifically Report 121 (2014) 'Harbour Approach Channels Design Guidelines) was noted. Participants acknowledged the need for automation to enhance accuracy and discussed potential collaborations with relevant committees.

At DTEC4, Singapore MPA gave a presentation overview of their Shipmast Height Detection System (SHDS) during WG2. It was noted that a no-go decision point was at the 2km mark so as to allow the operator to intervene timely. It was also noted that in Singapore MPA's context, the SHDS system was not integrated with the VTS system and was overseen by the VTS watch manager via a separate screen.

DTEC4 completed the review document on Ship Air Draft Remote Measurement Technology (SADRMT) and updated the IALA FileShare with the completed review.

#### **Action item(s):**

**IALA members** asked to note the completed review document on Ship Air Draft Remote Measurement Technology.

##### **9.8.3**      **Update on Qualcomm's 5G Precise Positioning for Ports**

Input paper: NA

DTEC4 continued the review of Qualcomm 5G-NR technology, based on the updated G1153 document provided by Qualcomm at DTEC3. Following confirmation of 3 remaining items with Qualcomm, the review was completed.

#### **Action item(s):**

**IALA Members** are asked to note the completed review document on Qualcomm's 5G Precise Positioning for Ports.

##### **9.8.4**      **Overview of Addvalue's Inter-satellite Data Relay System (IDRS)**

Input Paper: NA

Ho Wing Kei from Maritime and Port Authority of Singapore gave an overview of this presentation during Opening Plenary and invited interested DTEC members to join in the Addvalue's presentation slot on 26 Mar 2025.

Francis Low from Addvalue gave an overview of the Inter-satellite Data Relay System (IDRS) technology, which essentially extends the coverage of LEO satellites by leveraging the global coverage of Inmarsat/Viasat's network of GEO satellites. He shared that the IDRS infrastructure was already in place, operational and fully tested. It was noted that there are already 20 IDRS-enabled satellites launched by Inmarsat/Viasat to date, and is expected to grow by about another 30 more over the next few years. It is globally available to commercial, scientific and government LEO satellites, and is designed with secure end-to-end links and supportable with customer-defined encryption. It was noted that the key benefit of IDRS will be more apparent for large LEO constellations, in which case can provide truly ubiquitous maritime communications coverage globally.

#### **Action item(s):**

NIL

##### **9.8.5**      **Overview of Proposal for Developing a Guideline for Exchanging GNSS Interference Data**

Input paper: DTEC4-6.2.2.2 refers

Olli Soininen from FinTraffic shared the intent behind this proposal, which was a conceptual need for a standardized method to exchange Global Navigation Satellite System (GNSS) interference data between shore and ship and vice versa.

Olli shared that the increasing reliance on GNSS for safe maritime navigation makes it crucial to detect and mitigate GNSS interferences. He added that there was no standardized mechanism for ships to receive GNSS interference alerts from shore nor a system for ships to report detected interference back to shore authorities in a structured manner. To the query whether this solution would be suitable for S-124 for navigation warnings, Olli explained that more precise locations, and hence smaller cells, might be required to support this.

The working group supported the proposal to create a new work task for this and Olli would be creating a request based on IALA procedures. This work task would present relevance to other IALA committees, such as ENG due to R-mode, ARM due to the operational elements entailed, and VTS due to the operational workflows. New collaborators could be added under the scope of the work tasks, noting the related recommendation R1017 and guideline G1180.

#### **Action item(s):**

*The **Secretariat** is requested to forward the proposed new task on developing guidance for exchanging GNSS interference data in updated Work Programme 2025-2027 to the Council for approval as appropriate.*

#### **9.8.6      Review of IALA G1153**

Input Document: DTEC4-6.2.0.2

#### **Comments**

DTEC3 had asked LAP several questions regarding IALA G1153 Template for the review of emerging technologies for possible use by IALA including the update of the wording after the change to IGO status, text of the questions, legal issues associated with the implementation of the technology and intellectual property rights (essential patents) associated with the technology. In the input document provided by LAP, it was recommended for DTEC to consider the following:

- Deletion of references to the working group.
- Maintaining the essence of the guideline as a useful tool for assessing new and emerging technologies.
- Continuing the review of technologies as received by the Committee as an internal process.

In carrying out the revision, the members wish to confirm that the response is appropriate to the feedback from LAP. As such, the revised version (in track changes) is being forwarded for consideration prior to final approval by the Committee for forwarding to IALA Council.

#### **Output:**

Output documents were developed and reviewed:

1. DTEC4-15.3.1 – Liaison note on the Review of IALA G1153 – Template for the Review of Emerging Technologies for Possible Use by IALA Members

#### **Key outcomes include:**

The working group noted the input document and the G1153 document and prepared a revised G1153 for confirmation with LAP that the comments have been addressed.

#### **Action item(s):**

*The **Secretariat** is requested to forward the Liaison note on the Review of IALA G1153 (DTEC4-15.3.1) to LAP.*

#### **9.8.7      Review of IALA G1178**

Input Document: G1178 Ed1.0 An introduction to the Artificial Intelligence (AI) from an IALA perspective.

#### **Comments**

Based on the review of developing technologies, and noting the significant developments in AI and ML since the development of the document in 2019-2022, the working group agreed that G1178 should be reviewed and updated.

Olaf Christians agreed to be task leader for this review, which will commence at DTEC5.

**Output:**

No output on this item at DTEC4.

**Key outcomes include:**

The working group encouraged members to contribute to the review of IALA G1178 in preparation for DTEC5.

Initial thoughts for the review of G1178 were noted in the MSWord version of the guideline.

**Action item(s):**

*The **Secretariat** is requested to forward the working paper on G1178 Introduction to AI in IALA Domain (DTEC4-15.5.3) to DTEC5 for further review.*

**9.8.8 Response to ARM on Liaison Note on Development of Guidance on the use of simple IoT sensors on physical Aids to Navigation**

**Input Documents:**

1. G1179 Ed1.0 An introduction to the Internet of Things from an IALA perspective
2. DTEC4-6.2.2.13 Liaison note to all Committees on Development of IoT Guidance (ARM19-11.2.2)

**Comments**

The working group noted the existing IALA G1179 – An Introduction to the Internet of Things (IoT) from an IALA Perspective, which indicates that IoT refers to a network of physical objects (“things”) that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet. It is also noted that the automated sharing of data from multiple “objects” (“things”) is used in many aspects of AtoN but may not have been considered as an IoT system, nothing that machine-to-machine connectivity has been in use for some time. The “objects” have usually been hard-wired or connected through private networks, which is different to the use of the internet for the connectivity.

**Output:**

The following output document was developed and reviewed:

1. DTEC4-15.3.2 - Liaison note to ARM on Development of Guidance on the use of simple IoT sensors on physical Aids to Navigation

*Attachment – IALA G1179 MSWord Version*

**Key outcomes include:**

The ARM committee is requested to note the inputs from the DTEC Committee and is invited to review and refine IALA G1179.

**Action item(s):**

*The **Secretariat** is requested to forward a Liaison note on Development of Guidance on the use of simple IoT sensors on physical Aids to Navigation (DTEC4-15.3.2) to ARM for consideration.*

**9.9 Review of Additional Documents**

As identified during the opening Plenary, WG2 noted and reviewed the following additional input documents:

DTEC4	3.1.1	Report of the 1st General Assembly of IALA
DTEC4	3.1.1.1	Credentials, participation, numbering etc. in IALA committees and subsidiary bodies as an IGO
DTEC4	3.1.3	Report of PAP56 (PAP56-7.1)
DTEC4	3.4.1	IALA Report on MSC109
DTEC4	3.5.1	IALA Report Joint IMO-ITU Expert group 7th to 11th October 2024
DTEC4	3.5.2	IALA Report on ITU-R WP5B meeting 19 to 28 November 2024
DTEC4	6.2.0.3	Liaison note from IEC TC80-MT7 to IALA (MT7-2426)
DTEC4	6.2.0.6	IMO-ITU EG 20-WP.1 Draft Report to the NCSR Sub-Committee and ITU
DTEC4	6.2.0.12	Input paper on the Seminar on the Safety of Navigation
DTEC4	6.2.0.12.1	Annex to the Input paper on the Seminar on the Safety of Navigation
DTEC4	6.2.0.13	Input paper on the Seminar on VDES
DTEC4	6.2.0.13.1	Report on the Seminar on VDES
DTEC4	6.2.0.15	Consideration regarding the proposal for the development of IALA's position on the WRC-27 agenda items

All additional documents were reviewed.

## 10. WORKING GROUP 3 – DIGITAL COMMUNICATION SYSTEMS (WG3)

During the 4<sup>th</sup> session of the DTEC committee, the WG3 worked mainly on VDES and AIS topics to further develop the tasks assigned to the working group.

The Chair and Vice-Chair of the Working Group thanked all participants, both in person and online for their hard work during the session. They noted the ongoing success of the hybrid working environment.

During DTEC4 the Working Group met in a hybrid meeting environment and focused on the following items:

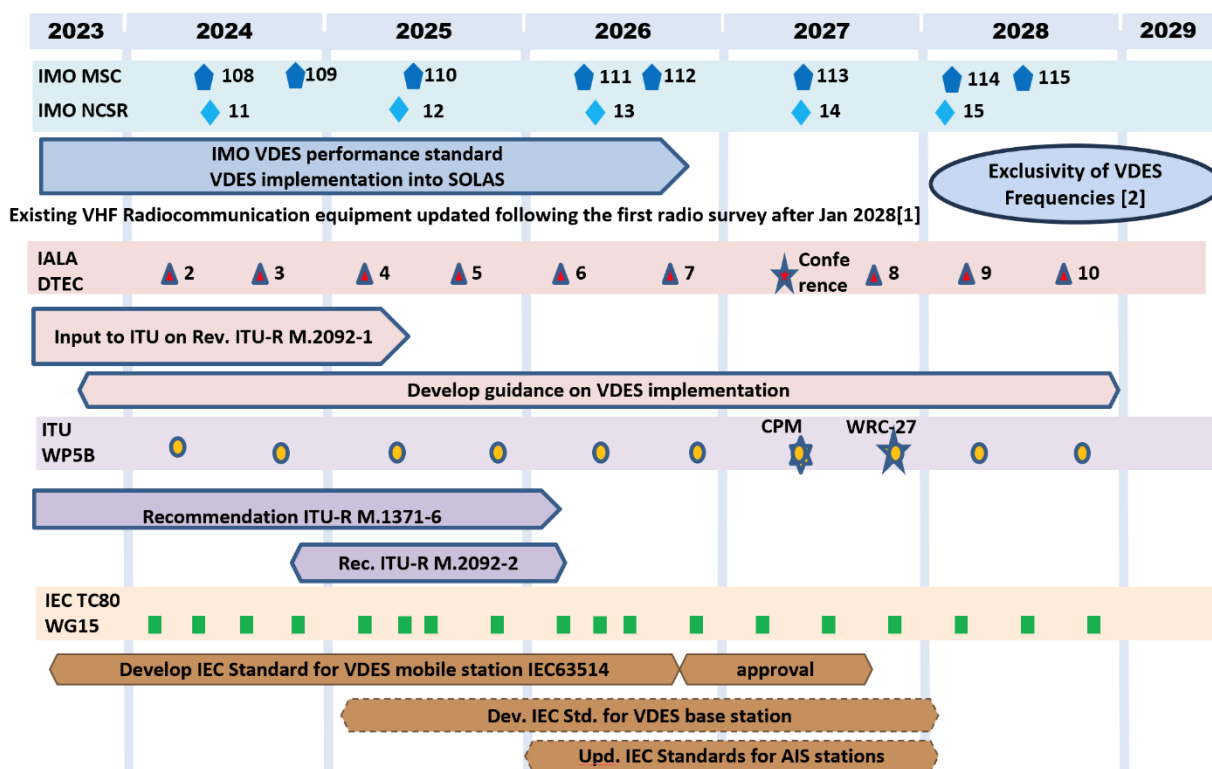
- Liaise with IMO on Working Group topics.
- Task 6.1.1 on ASM for disaster management
- Task 6.1.1 on Updates to Circ. 289.
- Task 6.3.4 Develop Guidelines on VDES Authentication Techniques.
- Task 6.3.4 Task on VDES R-mode.

- Task 6.3.5 Develop Guidelines on VDES resource sharing and coordination/cooperation.
- Task 6.3.6 Review and update R1007 The VHF Data Exchange System (VDES) for shore infrastructure.
- Task 6.3.7 Liaise with ITU on Recommendation ITU-R.M 2092-1.
- Task 6.3.10 New IALA Guideline on VDES system integration into ship and shore side.
- Task DTEC-6.3.11 Recommendation for the AIS Service.
- Task 6.3.12 Review of the contents of A-124 series recommendations.
- Liaison with ITU on ITU-R M.1371.
- IALA position on WRC-27.
- VDES Guideline on VDES Signal Measurement.
- VDES use cases for GNSS.
- VDES Circular Polarized Ship Antenna.

Tasks not started because of missing inputs:

- 6.3.2: Develop guidance on Digital VHF communication, it should be considered to take that task over to WG2 in the task registry.
- 6.3.9: Develop guidance on documentation on communications channels for public service digital information services in coastal areas, where the A-123 and A-124 part should be considered as covered by Task 6.3.10.

The group reviewed the working version of the VDES roadmap from DTEC3 and did not see the need for any amendments.



[1]: MSC.1/Circ.1460/Rev.5

[2]: according to Appendix 18 to the ITU Radio Regulations of 2024 (WRC-19), the VDES frequencies are exclusively assigned for VDES 1<sup>st</sup> of January 2030;

Figure 1 updated VDES implementation plan, see file Committees/ENAV-DTEC/WG3/20240930\_DTEC3/WORKING/20241002\_VDES\_Roadmap.pptx

### 10.1 Liaise with IMO on Working Group topics

**Task group leader:** Hideki Noguchi, DTEC Chair, Japan

**Input papers:**

6.2.0.9	IMO VDES CG report to NCSR12
6.2.0.10	IMO NCSR 12_9 VDES CG Report

**Comments:**

Hideki reported on the advances of the IMO VDES Performance Standard and the consequential changes to many IMO documents.

The group notes that many countries can be expected be interested in authentication of AIS messages and R-Mode, which VDES supports, and maritime operators to incentivize VDES because of the use cases it provides (see Guideline G1117).

With the current draft IMO Performance Standard, VDES may support GMDSS, as e.g. AIS is today with its position reports.

Hideki, however, highlights that VDES, according to the draft IMO VDES Performance Standard is not GMDSS equipment, but the document doesn't prevent VDES to enter GMDSS in the future.

To make VDES enter SOLAS, a consensus at IMO needs to agree that VDES is "the" technology to solve certain IMO needs that are not addressable by other IMO instruments.

Hideki informed the group of the growing interest in VDES, e.g. WMO is investigating it's usability for VDE-SAT uplink weather reports from ships.

**Output:**

None.

### 10.2 Task 6.1.1 on ASM for disaster management

**Comments:**

It was decided in the opening plenary not to progress this task in DTEC4.

**Output:**

None.

### 10.3 Task 6.1.1 Updates to Circ. 289

**Task group leader:** Hideki Noguchi

**Input papers:**

None.	
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**Comments:**

The group received a walkthrough of the document by China MSA for DTEC3.

No inputs were received for DTEC4. The task was not progressed.

Some members of the group propose to consider using the new Maritime Messaging System (RTCM 13900.0).

Some members remind us to consider that the use of ASM's as defined by IALA and in IMO SN.1/Circ.289 can be used today with existing equipment.

Further work is necessary, and the groups encouraged China MSA to continue that effort.

**Output:**

None.

**Action item(s):**

**Committee participants** interested in contributing to the drafting work on an update of SN.1/Circ.289 are invited to contact Shuaiheng Huai by email to [huaishuaiheng@dlmu.edu.cn](mailto:huaishuaiheng@dlmu.edu.cn).

#### 10.4 Task 6.3.4 Develop Guidelines on VDES Authentication Techniques

**Task group leader:** Jan Safar, GLA

**Comments:**

Jan Safar presented the current change proposals to the document, managed on [https://github.com/gla-rad/iala\\_g\\_vdes\\_authentication](https://github.com/gla-rad/iala_g_vdes_authentication).

The group agreed that a good first use case for VDES authentication is virtual AtoN authentication, and to concentrate on the target to get a first edition published covering only that use case as a start.

The group reviewed all current change proposals prepared by GLA for that goal and provided additional contributions that were incorporated immediately into the document.

The group considered in that work to be compatible with the known revisions to ITU-R M.2092-1 and the upcoming IEC equipment standard for VDES mobile stations.

The group notes that this draft first edition could be very valuable to address the risks posed by non-authenticated virtual AtoN, and should be noted by IMO. However, as the deadline for NCSR12 is over, a verbal comment by the IALA delegation at NCSR12 could be beneficial for IMO members to be made aware of the new Guideline's existence.

The group further notes, that virtual AtoN is only the first use case covered by this guideline, and there will be more use cases to be covered during the work progressed in the next DTEC meetings, i.e. the Task is not closed, however the group sees significant value in the proposed Edition 1.0, which should be disseminated to the maritime world as to the pressing need to start investigating solutions to mitigate the risks associated with un-authenticated AIS transmissions.

**Output:**

Draft Edition 1.0 of the Guidelines on VDES Authentication Techniques

**Action item(s):**

*The **Secretariat** is requested to forward the new draft Guideline on VDES Authentication Techniques (DTEC4-15.4.2) to the Council for approval.*

**Committee participants** are invited to submit the consequential updates to R1007 for DTEC5 and to work on a liaison note to IMO regarding the new guideline and the updated R1007 during DTEC5.

**Committee participants** interested in contributing to the work on the new guideline on VDES Authentication are invited to email the task group lead, Jan Safar, [jan.safar@gla-rad.org](mailto:jan.safar@gla-rad.org) to join the group.

## 10.5 Task 6.3.4 on VDES R-mode

**Task group leader:** Ronald Raulefs, DLR

**Input papers:**

Presentation	By Krzysztof Bronk, NIT, see <a href="https://nextcloud.iala.int/index.php/f/342277">https://nextcloud.iala.int/index.php/f/342277</a> in <a href="#">Presentation - Dateien - IALA Nextcloud</a>
Presentation	By Ronald Raulefs, DLR, see <a href="https://nextcloud.iala.int/index.php/f/345965">https://nextcloud.iala.int/index.php/f/345965</a> in <a href="#">Presentation - Dateien - IALA Nextcloud</a>
6.2.2.2	Proposal for Developing a Guideline for Exchanging GNSS Interference Data (Fintrafik, Kongsberg, DLR)

**Comments:**

The presentation from NIT showed that with high effort on time synchronization between base stations, an average precision of 7m can be achieved by use of VDES R-mode.

The group discussed that cryptographic protection against spoofing should be considered also for R-mode, to be covered in the work on Taks-6.3.4 [Develop Guidelines on VDES Authentication Techniques](#).

The presentation from DLR showed that:

The presentation from DLR showed that:

- G1158 v2.0 was accepted and published by IALA.
- New enhancements in G1158 are foreseen:
  - Timing information for ASM R-Mode
  - Considering VDE-SAT for R-Mode ranging source
  - Flexibility to adapt the resources for ranging sequences
  - Providing details about 6.2.2.2. (Proposal for Developing a Guideline for Exchanging GNSS Interference Data) to be considered by a future G1158.
- Discussing the current status of the proposal submitted by multiple European countries, as well as the European Commission, for an IMO R-Mode performance standard to the last IMO MSC 109 meeting. The next MSC 110 meeting will discuss the proposal.
  - **Committee members are kindly requested to support the R-Mode performance standard proposal at the next MSC 110 meeting in June 2025.**
- Providing details about the study item question at ITP WP5B about VDES R-Mode. It is not clarified if a radionavigation service allocation is needed.

**Output:**

No outputs.

**Action item(s):**

**Committee members** are invited to support the European proposal at IMO MSC 110 to develop an R-Mode Performance standard.

## 10.6 Task 6.3.5 Develop Guidelines on VDES resource sharing and coordination/cooperation

**Task group leader:** Koichi Yoshida, Japan

#### Input papers:

6.3.2.1	Draft Guidelines on VDES Resource Sharing
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#### Comments:

Koichi Yoshida from Japan presented the input and noted that taking the draft VDES authentication guideline into account and liaise with the work on the draft VDES infrastructure guideline.

#### Output:

No outputs.

#### Action item(s):

**Committee members** are invited to participate in the intersessional meeting through correspondence to Koichi Yoshida [yoshida@rime.jp](mailto:yoshida@rime.jp).

### 10.7 Task 6.3.6 Review and update R1007 The VHF Data Exchange System (VDES) for shore infrastructure

#### Comments:

Council asked DTEC to create a Liaison with IMO to inform about the update of R1007 to Edition 2.0.

The group agreed on a Liaison to MSC 110.

#### Output:

DTEC4-15.4.1 MSC information paper on VDES\_draft.docx

#### Action item(s):

The **Secretariat** is requested to forward the Information paper on VDES (DTEC4-15.4.1) to the Council for approval, and subsequently to IMO MSC according to the applicable MSC information paper input deadline.

### 10.8 Task 6.3.7 Liaise with ITU on Recommendation ITU-R.M 2092-1

**Task group leader:** WG3 Plenary

#### Input papers:

6.2.0.8	Proposal of amendment to ITU-R M2092-1 (Japan)
6.2.2.6	Proposed Revisions to Recommendation ITU-R M.2092-1 (China MSA)
20250324_CML	Informal input on equalizer performance, and to remove the temporarily added multicarrier linkIDs.
20250321_Furuno	Informal input.

#### Comments:

The inputs were provided with the purpose to identify inconsistencies between IEC, ITU and current other change proposals before the ITU WP5B meeting. The activity maximises alignment and success probability for each change proposal. Following feedback was given:

For 6.2.0.8: on low power VDES to ITU WP5B => the group agrees to input after amendments.

For 6.2.2.6:

- MSA-1 controlling mobile terminal use of the ASM-SAT UL: was discussed by the group, China agreed to revise the proposal for reinspection by the group.
- MSA-2 simplifying/correcting VDE-TER terminal capabilities: The group agreed that the revision of ITU-R M.2092-1 would benefit from this proposal.
- MSA-3 adding the capability to overlapping VDE-TER control station areas into 2092: the group agrees there is need for a method to manage overlapping coverage areas, but would welcome a more analytic approach first to investigate alternative methods to handle overlapping areas. The proposed method would make type approval much more complex which could motivate to investigate alternatives.
- MSA-4: flora from China: the group thanks China for the proposal, which is highlighting an implicit limitation of VDE-SAT in 2092. While it is not strictly necessary to point that out in 2092, it is important to take that work forward in IEC.

For 20250324\_CML: the group reviewed the measured equalizer performance and the proposed changes to IEC to ensure VDES performance will be tested in accordance with the observed channel conditions in type approved equipment. The group agreed that the revision of ITU-R M.2092-1 would benefit from this proposal and Yoshio agreed to propose it to the Japanese ITU delegation.

For 20250321\_Furuno: Corrections of wrong colours and message IDs in several message sequence charts. The group agreed that the revision of ITU-R M.2092-1 would benefit from this proposal and Yoshio agreed to propose it to the Japanese ITU delegation.

#### Output:

None.

#### Action item(s):

**Committee Members** are invited to analyze methods to treat overlapping VDE-TER coverage and control station areas (indicated by bulletin board), including the proposed method in MSA-3, comparing the methods and trying to find an effective method balancing complexity in understanding, implementation, testing, training and operations to continue work during DTEC5.

### 10.9 Task 6.3.10 New IALA Guideline on VDES system integration into ship and shore side

**Task group leader:** Lukas Kim, All4Land

#### Input papers:

6.2.3.3	Proposal on Supplementing the Content of the New Guideline for VDES Service and Infrastructure (China MSA)
6.2.3.7	Draft Guideline for Shore VDES Infrastructure (All4Land)
6.2.0.14	Input paper on RTCM SC139 standard (RTCM)

#### Comments:

The group reviewed the inputs 6.2.3.3 and 6.2.3.7 and amended a small part during the time available at DTEC4.

There was significant participation by many committee members.

The amount of not reviewed material, and the amount of newly identified work and necessary clarifications triggered the group to plan for an intersessional:

The Intersessional meeting is planned as follows:

“IALA DTEC Intersessional on VDES Shore Infrastructure and Resource Sharing”, August 18-21 (Monday-Thursday), 2025 (9-17h local time) in Quebec, Canada, please subscribe as soon as possible to [sp@albatros-tech.eu](mailto:sp@albatros-tech.eu), [stefan.bober@wsv.bund.de](mailto:stefan.bober@wsv.bund.de) and [Jean-francois.Coutu@dfo-mpo.gc.ca](mailto:Jean-francois.Coutu@dfo-mpo.gc.ca). In that email, please indicate if you plan virtual or physical participation to allow us planning the physical means.

The Input 6.2.0.14 was presented by Stefan Pielmeier in a common plenary session, highlighting the value of the Maritime Messaging System, as part of the MCP, providing transport of maritime trusted services over multiple possible transfer carriers, such as VDES, NAVDAT or internet (for now), providing interfacing to services over the SECOM interface, and others.

A following demo was provided by AiVeNautics and

**Output:**

No outputs.

**10.10 Task 6.3.11 Recommendation for the AIS Service and 6.3.12 Review of the contents of A-124 series recommendations**

**Task group leader:** WG3 Plenary

**Input papers:**

none	
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**Comments:**

The group is taking A-124 into account in it's work on Task DTEC-6.3.10.

**Output:**

No outputs planned, will be taken over entirely by Task DTEC-6.3.10.

**10.11 Liaison with ITU on ITU-R M.1371**

**Input papers:**

6.2.3.4	Proposed Revision to Preliminary Draft of Recommendation ITU-R M.1371-5 (China MSA)
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**Comments:**

China MSA presented the input, proposing corrections to the retransmission control of AIS Messages 6 and 12, as well as improvements to the parameters in AIS Message 28.

After discussion and review, the group thanks for the review and considers the proposed changes as valuable input to the revision of ITU-R M.1371-5 and encourages China MSA to forward them to ITU WP5B.

**10.12 IALA position on WRC-27**

**Input papers:**

6.2.0.4	Propose on the development of IALA's position on the WRC-27
6.2.0.15	Consideration regarding the proposal for the development of IALA's position on the WRC-27 agenda items [from VTS-57]

**Comments:**

The group reviewed the inputs and agreed to the action proposed by VTS-57 in input 6.2.0.15 that PAP may decide for the process how IALA liaises with ITU on the positions of different committees.

### 10.13 VDES Guideline on VDES Signal Measurement

#### Input papers:

Working	Draft Guideline on VDES Singal Measurements
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#### Comments:

The group developed a draft guideline on performing high quality VDES Signal Measurements.

It was prepared as a new output.

#### Output:

Draft Guideline on VDES Signal Measurements.

#### Action item(s):

*The **Secretariat** is requested to forward the Draft Guideline on VDES Signal Measurements (DTEC4-15.4.3) to the Council for approval.*

### 10.14 VDES use cases for GNSS

#### Input papers:

6.2.3.6	Analysis on the options for retransmission of SBAS data through VDES (EUSPA, ESSP)
6.2.3.2	Transmission of GNSS augmentation data over VDES (CML)

#### Comments:

The input 6.2.3.6 was presented by ESSP EUSPA.

The input is considering the use case to transport SBAS over different VDES channels to improve the precision of GNSS positions, in areas where the weak signal from the geostationary satellites broadcasting the SBAS signal cannot be received sufficiently.

The proposal uses ASM, VDE-TER and VDE-SAT message types as published in ITU-R M.2092-1 and therefore does not need further amendments to that ITU recommendation.

The group encourages ESSP and EUSPA to consider proposing change proposals to IEC for the VDES and GNSS and IMO performance standards to ensure the corrections are output from VDES in a standardized format and are digested in the GNSS receivers internal and external to the VDES.

During the review of input 6.2.3.2 by CML, the group was informed that the existing differential GNSS transmissions might not be capable of transmitting corrections for all GNSS systems due to bandwidth limitations. VDES has a significant higher bandwidth and could accommodate these differential corrections better.

To give proper guidance, the Guideline G1117 section on GNSS might benefit from an update.

#### Action item(s):

**Committee Members** are invited to propose amendments to the IALA Guideline G1117 chapter on GNSS for the DTEC5 to provide more structure and overview of the different helping technologies for GNSS and how the architecture on shore and ship would need to look like to consume them. This change could include the proposed changes by ESSP, EUSPA and CML.

## 10.15 VDES Circular Polarized Ship Antenna

### Input papers:

6.2.3.5	Input paper on AIS Performance using RHCP Ship Antenna
Presentation	<a href="#">WG3/20250324 DTEC4/Presentation/Kongsberg RHCP antenna AIS measurements DTEC4 20250326</a>

### Comments:

Kongsberg presented AIS performance measurement results with a novel VDE-SAT optimized RHCP VDES antenna. While expecting a 3dB loss for AIS reception with the RHCP antenna, the report indicates a slight AIS performance increase. Reasons are suspected to be noise reduction from other terrestrial VHF sources. Further measurements are planned according to Kongsberg.

## 10.16 Review of IALA Work Programme 2025-2027 and DTEC WG3 Task Register

The IALA work programme was reviewed in conjunction with the DTEC WG3 detailed task register.

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

## 11. SUMMARY OF OUTPUT AND WORKING PAPERS

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

Outputs from DTEC4 were approved by the Committee using the approval procedure. The output documents and working papers are listed in Annex D.

## 12. REVIEW OF SESSION REPORT

The draft report of the meeting (DTEC4-12.1) was approved by the Committee at the Closing Plenary.

## 13. DATE AND VENUE OF NEXT MEETINGS

DTEC5 is planned to be held between 29 September 2025 - 03 October 2025 at IALA Headquarters, Saint Germain-en-Laye, France.

Other IALA events will be publicised on the IALA website.

## 14. ANY OTHER BUSINESS

## 15. CLOSING OF THE MEETING

The Chair thanked all Committee participants again for all the engagement and hard work. He hoped that all the participants would return again to DTEC5.

Finally, the Chair asked if there were any final comments that participants wished to make; there were none.

## 16. LIST OF ANNEXES

### A. Agenda

A copy of the agenda is at Annex A.

- B. Participants list  
A list of participants is at Annex B.
- C. Input Papers  
A list of input papers is at Annex C.
- D. Output and Working papers  
A list of output and working papers is at Annex D.
- E. Action Items  
A list of action items is at Annex E.
- F. Working Group Participants Lists  
Lists of working group participants is at Annex F



## 4<sup>th</sup> Meeting of the Digital Technologies Committee (DTEC4)

The physical week of the 4<sup>th</sup> session of the DTEC Committee will take place on the 24 – 28 March 2025 at the IALA HQ, Saint Germain-en-Laye, France. Please note that the Opening Plenary will be held hybrid on Monday, 24 March, starting at 09:00 UTC. The Closing Plenary will be held online on Thursday 3 April 2025 starting at 10:00 UTC.

### Agenda

1. Introduction
  - 1.1. Welcome from the Secretary-General Francis Zachariae
  - 1.2. Approval of agenda Hideki Noguchi
  - 1.3. Apologies Hideki Noguchi
  - 1.4. Working arrangements Alisa Nechyporuk
2. Review of action items from last session
  - 2.1. Review of action items from DTEC3 Hideki Noguchi
3. Reports from other bodies and initiatives
  - 3.1. IALA Minsu Jeon
    - 3.1.1. IALA General Assembly Minsu Jeon
    - 3.1.2. IALA Council Minsu Jeon
    - 3.1.3. IALA Policy Advisory Panel (PAP) Minsu Jeon
    - 3.1.4. WWA Updates Jaime Alvarez
  - 3.2. Digital@Sea Minsu Jeon
  - 3.3. IHO Minsu Jeon
  - 3.4. IMO Hideki Noguchi / Minsu Jeon
    - 3.4.1. MSC
    - 3.4.2. NCSR
  - 3.5. ITU Stefan Bober
  - 3.6. IEC Stefan Bober / Jorge Arroyo
  - 3.7. ISO Minsu Jeon
  - 3.8. ISO-IEC JTC 1 Jin Hyoungh Park
  - 3.9. RTCM Ross Northswordy / Johnny Schultz
  - 3.10. 3GPP Hyounhee Koo
  - 3.11. VDES Alliance Stefan Pielmeier
4. Presentations

- 4.1. Open digital incubator (AMSA, KRISO, AIVeNautics, GMT)
- 4.2. SAT VDES (Maritime and Port Authority of Singapore – MPA)
- 4.3. Field Trial on VHF Digital Voice Communication (Japan Coast Guard)
- 4.4. VDES sea trials (FURUNO ELECTRIC CO., LTD.)
- 4.5. Tackling Maritime Operations through Digitalisation (MPA)
- 4.6. IMT Workshop (Jan-Hendrik Oltmann)
5. Work programme management
  - 5.1. Work Programme, Task Plan, Task Register
  - 5.2. Action plan for this session
6. Review of input papers
  - 6.1. Introduction of input papers Submitter(s)
  - 6.2. Allocation of input papers Hideki Noguchi
7. DTEC4 Working Group programmes and arrangements
  - 7.1. WG1 – Digital Information System Jin Hyoung Park
  - 7.2. WG2 – Emerging Digital Technology Jillian Carson-Jackson
  - 7.3. WG3 – Digital Communication System Stefan Pielmeier
8. Break out into Working Groups
9. Reconvene Plenary Session (Friday 28 March, 07:00 – 09:00 UTC)
10. Summary of Working Group reports, documents, and output papers (Plenary Session)
  - 10.1. WG1 – Digital Information System Jin Hyoung Park
  - 10.2. WG2 – Emerging Digital Technology Jillian Carson-Jackson
  - 10.3. WG3 – Digital Communication System Stefan Pielmeier
11. DTEC4 Output's Review Period
12. Closing Plenary (Thursday 03 April, 10:00 – 13:00 UTC, online)
  - 12.1. Review of session report
  - 12.2. Review of outcome documents
  - 12.3. Date and venue of next meeting
13. Close of the meeting
14. Any other business
15. Summary of output and working papers
  - 15.1. Committee wide
  - 15.2. WG1 output
  - 15.3. WG2 output
  - 15.4. WG3 output
  - 15.5. Working papers

## ANNEX B LIST OF PARTICIPANTS

Last Name	First Name	Member Type	Country	Organization
Moeller	Julius	Member State (IGO)	Australia	Australian Maritime Safety Authority
Mbene Koah	Alain Serge	Affiliate (IGO)	Cameroon	Port Authority of Kribi
Riendeau	Natacha	Member State (IGO)	Canada	Canadian Coast Guard
Arriagada	Henry	Member State (IGO)	Chile	Armada de Chile – DIRECTEMAR
Araneda	Rodrigo	Member State (IGO)	Chile	Armada de Chile – DIRECTEMAR
Fuentes	Héctor	Member State (IGO)	Chile	Armada de Chile – DIRECTEMAR
Mella	José	Member State (IGO)	Chile	Armada de Chile – DIRECTEMAR
Pérez	Jordan	Member State (IGO)	Chile	Armada de Chile – DIRECTEMAR
Pizarro	Víctor	Member State (IGO)	Chile	Armada de Chile – DIRECTEMAR
Huai	Shuaiheng	Member State (IGO)	China	Ministry of Transport of the People's Republic of China
Li	Yang	Member State (IGO)	China	Ministry of Transport of the People's Republic of China
Liu	Jialin	Member State (IGO)	China	Ministry of Transport of the People's Republic of China
Yao	Gaole	Member State (IGO)	China	China Maritime Safety Administration
Xue	Feng	Member State (IGO)	China	China Maritime Safety Administration
Di	Eduardo	Affiliate (IGO)	Czech Republic	European Union Agency for Space Programme (EUSPA)
Christensen	Thomas	Affiliate Industrial (IGO)	Denmark	AlVeNautics
Haagh	Oliver	Affiliate Industrial (IGO)	Denmark	AlVeNautics
Jensen	Rasmus Madsen	Member State (IGO)	Denmark	Danish Maritime Authority
Pfeiffer	Michael	Member State (IGO)	Denmark	Ministry of Resilience and Preparedness
Saarnak	Christopher	Member State (IGO)	Denmark	Ministry of Resilience and Preparedness
Pielmeier	Stefan	Affiliate Industrial (IGO)	Denmark	Albatros-Tech ApS
Strandberg	Michael	Member State (IGO)	Denmark	Danish Maritime Authority
Weibrecht	Jakob	Affiliate Industrial (IGO)	Denmark	Sternula A/S
Moltsen	Lars	Affiliate Industrial (IGO)	Denmark	Sternula A/S
Svendsen	Mads S.	Affiliate Industrial (IGO)	Denmark	Sternula A/S
Heikonen	Kaisu	Member State (IGO)	Finland	Finland-Finnish Transport Infrastructure Agency
Kannos	Sirpa	Affiliate (IGO)	Finland	Fintraffic Vessel Traffic Services Ltd
Kukkonen	Antti	Affiliate Industrial (IGO)	Finland	Furuno Finland Oy
Miraftabi	Ramin	Affiliate (IGO)	Finland	Fintraffic Vessel Traffic Services Ltd
Pitkanen	Juho	Affiliate (IGO)	Finland	Fintraffic Vessel Traffic Services Ltd
Soininen	Olli	Affiliate (IGO)	Finland	Fintraffic Vessel Traffic Services Ltd
Christians	Olaf	Affiliate Industrial (IGO)	France	Airbus Defence and Space
Duret	Anne	Member State (IGO)	France	Direction générale des affaires maritimes, de la pêche et de

Last Name	First Name	Member Type	Country	Organization
				l'aquaculture, Secrétariat d'Etat chargé de la Mer
Hernoe	Xavier	Member State (IGO)	France	Direction générale des affaires maritimes, de la pêche et de l'aquaculture, Secrétariat d'Etat chargé de la Mer
Larue	Johann	Affiliate Industrial (IGO)	France	Airbus Defence and Space
Rigole	Antoine	Member State (IGO)	France	Direction générale des affaires maritimes, de la pêche et de l'aquaculture, Secrétariat d'Etat chargé de la Mer
Bober	Stefan	Member State (IGO)	Germany	Federal Waterways and Shipping Agency
Kirkedal Thomsen	Michael	Affiliate (IGO)	Germany	DLR (and University of Copenhagen/University of Oslo)
Oltmann	Jan-Hendrik	Member State (IGO)	Germany	Federal Waterways and Shipping Agency
Raulefs	Ronald	Affiliate (IGO)	Germany	German Aerospace Centre
Ritterbusch	Jochen	Member State (IGO)	Germany	Federal Maritime and Hydrographic Agency
Chensudar	Kartik	Member State (IGO)	India	Directorate General of Lighthouses and Lightships
Yadav	Birendra	Member State (IGO)	India	Directorate General of Lighthouses and Lightships
Boyle	Ronan	Member State (IGO)	Ireland	Commissioners of Irish Lights
Butchart	Cameron	Affiliate Industrial (IGO)	Ireland	Wartsila Voyage Limited
Hollanti	Juha	Affiliate Industrial (IGO)	Ireland	Wartsila Voyage Limited
Rostopshin	Dmitry	Affiliate Industrial (IGO)	Ireland	ICS TECHNOLOGIES s.r.l.
Balbo	Sara	Associate (IGO)	Italy	Ministero delle infrastrutture e dei trasporti-Italian Coast Guard
Borghese	Francesco	Affiliate Industrial (IGO)	Italy	ELMAN S.r.l.
Caluisi	Cristiano	Associate (IGO)	Italy	Ministero delle infrastrutture e dei trasporti-Italian Coast Guard
Fiorentino	Luca	Affiliate Industrial (IGO)	Italy	ELMAN S.r.l.
Pizzimento	Johnny Paolo	Associate (IGO)	Italy	Italian Navy - Direzione Fari e Segnalamenti
Stagira	Francesco	Associate (IGO)	Italy	Ministero delle infrastrutture e dei trasporti-Italian Coast Guard
Tomaino	Marco	Associate (IGO)	Italy	Ministero delle infrastrutture e dei trasporti-Italian Coast Guard
Varde	Damiano	Associate (IGO)	Italy	Ministero delle infrastrutture e dei trasporti-Italian Coast Guard
Kambire	Hollo	Associate (IGO)	Ivory Coast	Port Autonome d'Abidjan
Arita	Mayumi	Member State (IGO)	Japan	Japan Coast Guard
Card	Michael	Affiliate Industrial (IGO)	Japan	Zeni Lite Buoy Co Ltd
Fukuto	Junji	Affiliate (IGO)	Japan	JSTRA
Kawagoe	Koichi	Member State (IGO)	Japan	Japan Coast Guard
Kimura	Daisuke	Affiliate Industrial (IGO)	Japan	Furuno Electric Co Ltd
Kowaki	Minoru	Affiliate Industrial (IGO)	Japan	Furuno Electric Co Ltd
Miyadera	Yoshio	Affiliate Industrial (IGO)	Japan	Japan Radio Co., Ltd.

Last Name	First Name	Member Type	Country	Organization
Nakamura	Daichi	Affiliate Industrial (IGO)	Japan	ArkEdge Space Inc.
Nemoto	Yu	Member State (IGO)	Japan	Japan Coast Guard
Nishimura	Koichi	Affiliate Industrial (IGO)	Japan	TST Corporation
Noguchi	Hideki	Member State (IGO)	Japan	Japan Coast Guard
Ogino	Ichiya	Affiliate Industrial (IGO)	Japan	Furuno Electric Co Ltd
Takahashi	Tetsuo	Affiliate Industrial (IGO)	Japan	ArkEdge Space Inc.
Takeuchi	Kinji	Member State (IGO)	Japan	Japan Coast Guard
Uemura	Ryohei	Affiliate Industrial (IGO)	Japan	ArkEdge Space Inc.
Watagawa	Masanori	Affiliate Industrial (IGO)	Japan	ArkEdge Space Inc.
Watanabe	Hiroaki	Affiliate Industrial (IGO)	Japan	IHI Corporation
Yoshida	Koichi	Member State (IGO)	Japan	Sasakawa Peace Foundation, Ocean Policy Research Institute
Hong	Sunbae	Affiliate (IGO)	Korea, South	Korea Maritime Cooperation Center
Hyun	Chaewon	Affiliate (IGO)	Korea, South	Korea Maritime Cooperation Center
Kim	Hyun	Affiliate Industrial (IGO)	Korea, South	GMT Co Ltd
Kim	Peter	Affiliate Industrial (IGO)	Korea, South	GMT Co Ltd
Kim	Younghun	Affiliate Industrial (IGO)	Korea, South	GMT Co Ltd
Kim	Bu Young	Affiliate (IGO)	Korea, South	KRISO Korea Research Institute of Ships and Ocean Engineering
Lee	Elly Seomgyeol	Affiliate Industrial (IGO)	Korea, South	GMT Co Ltd
Lee	Han Jin	Affiliate (IGO)	Korea, South	KRISO Korea Research Institute of Ships and Ocean Engineering
Lee	Wonhee	Affiliate (IGO)	Korea, South	KRISO Korea Research Institute of Ships and Ocean Engineering
Park	Jin Hyoung	Affiliate Industrial (IGO)	Korea, South	AIVeNautics Corp.
Park	Dayoung	Affiliate (IGO)	Korea, South	Korea Maritime Cooperation Center
Shim	Woo-seong	Affiliate (IGO)	Korea, South	KRISO Korea Research Institute of Ships and Ocean Engineering
Shin	Chanock	Member State (IGO)	Korea, South	Ministry of Oceans and Fisheries
Kim	Dong Hyun	Affiliate (IGO)	Korea, South	RIMS
Yoo	Ju-Yeon	Affiliate (IGO)	Korea, South	RIMS
Hwang	Hungyu	Affiliate (IGO)	Korea, South	RIMS
Na	Claire	Affiliate Industrial (IGO)	Korea, South	ALLFORLAND
Kim	Lukas	Affiliate Industrial (IGO)	Korea, South	ALLFORLAND
Jaafar	Shah Habidin Arib	Member State (IGO)	Malaysia	Ministry of Transport Malaysia
Mohd Daud	Norazihan	Member State (IGO)	Malaysia	Ministry of Transport Malaysia
Tachghou	Mohamed	Associate (IGO)	Morocco	Ministry of Public Works and Transport
de Bie	Gerrit Jan	Affiliate (IGO)	Netherlands	Port of Rotterdam Authority
Åsheim	Harald	Member State (IGO)	Norway	Norwegian Coastal Administration
Lars	Loge	Member State (IGO)	Norway	Norwegian Coastal Administration
Bjoernevik	Anders	Affiliate Industrial (IGO)	Norway	Kongsberg Discovery
Hovda	Knut	Member State (IGO)	Norway	Norwegian Coastal Administration

Last Name	First Name	Member Type	Country	Organization
Isaksen	Lasse	Affiliate Industrial (IGO)	Norway	Kongsberg Discovery AS
Bronk	Krzysztof	Affiliate (IGO)	Poland	National Institute of Telecommunications
Altalhi	Ayyaf	Member State (IGO)	Saudi Arabia	Saudi Ports Authority
Bafana	Luthfi	Member State (IGO)	Singapore	Maritime and Port Authority
Chiew	Nicholas	Member State (IGO)	Singapore	Maritime and Port Authority
Ho	Wing Kei	Member State (IGO)	Singapore	Maritime and Port Authority
Khoo	Dennis	Member State (IGO)	Singapore	Maritime and Port Authority
Sen	Indranil	Affiliate Industrial (IGO)	Singapore	NCS Pte. Ltd
Teo	Jotham	Member State (IGO)	Singapore	Maritime and Port Authority
Carson-Jackson	Jillian	Sister Organization	Sister Organization	Nautical Institute
Lopez Cabeceira	Marcos	Affiliate Industrial (IGO)	Spain	GMV Aerospace and Defence S.A.U
Martin Sanchez	Jose Luis	Affiliate (IGO)	Spain	ESSP-SAS
El Bacha	Taoufik	Affiliate Industrial (IGO)	Sweden	Saab TransponderTech
Karlsson	Fredrik	Member State (IGO)	Sweden	Swedish Maritime Administration
Lindborg	Johan	Affiliate Industrial (IGO)	Sweden	Saab TransponderTech
Nyberg	Magnus	Affiliate Industrial (IGO)	Sweden	Saab TransponderTech AB
Olofsson	Mikael	Affiliate Industrial (IGO)	Sweden	Combitech AB (Saab)
Alagha	Nader	Affiliate (IGO)	The Netherlands	European Space Agency
Berrevoets	Maarten	Member State (IGO)	The Netherlands	Ministry of Infrastructure and Water Management
van Gils	Jeffrey	Member State (IGO)	The Netherlands	Ministry of Infrastructure and Water Management
Aydogan	Orkun	Affiliate Industrial (IGO)	Türkiye	HAVELSAN AS
Demir	Denizcan	Affiliate Industrial (IGO)	Türkiye	HAVELSAN AS
Kanyilmaz	Ali Okan	Affiliate Industrial (IGO)	Türkiye	Aselsan A.S
Pronenko	Volodymyr	Associate (IGO)	Ukraine	State Hydrographic Service of Ukraine
Smirnov	Iurii	Associate (IGO)	Ukraine	State Hydrographic Service of Ukraine
Tuzak	Viktoriia	Associate (IGO)	Ukraine	State Hydrographic Service of Ukraine
Batty	Ernest	Affiliate Industrial (IGO)	United Kingdom	IMIS Global Ltd
Burton	Paul	Affiliate (IGO)	United Kingdom	UK Hydrographic Office
Labushagne	Attie	Affiliate Industrial (IGO)	United Kingdom	CML Microcircuits
Love	Derek	Affiliate Industrial (IGO)	United Kingdom	CML Microcircuits
Meyer	Rhyno	Affiliate Industrial (IGO)	United Kingdom	IMIS Global Ltd
Ricketts	Simon	Member State (IGO)	United Kingdom	Department of Transport

Last Name	First Name	Member Type	Country	Organization
Safar	Jan	Member State (IGO)	United Kingdom	General Lighthouse Authorities of the UK & Ireland
Winter	Pieter	Affiliate Industrial (IGO)	United Kingdom	CML Microcircuits
Istanbullu	Cafer Ozkan	Sister Organization	United Kingdom	IMO
Armstrong	Patrick	Associate (IGO)	United States	US Coast Guard
Arroyo	Jorge	Associate (IGO)	United States	US Coast Guard
Diamond	Clayton	Affiliate (IGO)	United States	American Pilots Association Inc
Foster	Sean	Associate (IGO)	United States	US Coast Guard
Gallagher	Patrick	Associate (IGO)	United States	US Coast Guard
Schultz	Johnny	Associate (IGO)	United States	US Coast Guard
Norsworthy	Ross	Associate (IGO)	United States	US Coast Guard
Williams	Matthew	Sister Organization	United Kingdom	IMPA

All papers are posted on the Committee section of the IALA website. Items in blue = late or updated paper.

Meeting	Agenda Item	Output Paper Title	Source	Action
DTEC4	1.2.1	Provisional agenda v1.0	Secretariat	All
DTEC4	1.4	Programme for the week	Secretariat	All
DTEC4	2.1	Final report of DTEC3	Secretariat	All
DTEC4	2.1.1	DTEC3 Action Items	Secretariat	All
DTEC4	3.1.1	Report of the 1st General Assembly of IALA	Secretariat	All
DTEC4	3.1.1.1	Credentials, participation, numbering etc. in IALA committees and subsidiary bodies as an IGO	Secretariat	All
DTEC4	3.1.2.1	Report of the 3rd transition council (TC03-19.1)	Secretariat	All
DTEC4	3.1.2.1.1	Report on Transition Council 03	Secretariat	All
DTEC4	3.1.2.2	Report of the 1 <sup>st</sup> session of the Council	Secretariat	All
DTEC4	3.1.3	Report of PAP56 (PAP56-7.1)	Secretariat	All
DTEC4	3.4.1	IALA Report on MSC109	Secretariat	All
DTEC4	3.5.1	IALA Report Joint IMO-ITU Expert group 7th to 11th October 2024	Secretariat	All
DTEC4	3.5.2	IALA Report on ITU-R WP5B meeting 19 to 28 November 2024	Secretariat	All
DTEC4	5.1.1	Committees Work programme 2025-2027	Secretariat	All
DTEC4	5.1.1.1	Annex Work Programme 2025-2027	Secretariat	All
DTEC4	6.0	Input paper Committee meeting template	Secretariat	All
DTEC4	6.0.1	List of input papers	Secretariat	All
DTEC4	6.2.0.1	Liasion note ITU to IALA	ITU	All

DTEC4	6.2.0.2	Review of IALA G1153 Updates to the Emerging Technology Assessment Template and Internal Procedures	LAP27	All
DTEC4	6.2.0.3	Liaison note from IEC TC80-MT7 to IALA (MT7-2426)	IEC	All
DTEC4	6.2.0.4	Propose on the development of IALA's position on the WRC-27	Japan Coast Guard	All
DTEC4	6.2.0.5	Input PS on Disaster Management	Japan Coast Guard	WG1 WG3
DTEC4	6.2.0.5.1	Annex to the Input PS on Disaster Management	Japan Coast Guard	WG1 WG3
DTEC4	6.2.0.6	IMO-ITU EG 20-WP.1 Draft Report to the NCSR Sub-Committee and ITU	IMO-ITU EG	All
DTEC4	6.2.0.7	Liaison note to IALA from ITU WP5	ITU	All
DTEC4	6.2.0.8	Proposal of amendment to ITU-R M2092-1	Japan	WG3
DTEC4	6.2.0.9	IMO VDES CG report to NCSR12	Hideki Noguchi	WG3
DTEC4	6.2.0.10	IMO NCSR 12_9 VDES CG Report	Hideki Noguchi	WG3
DTEC4	6.2.0.11	Input paper on the IMT Workshop	Secretariat	All
DTEC4	6.2.0.12	Input paper on the Seminar on the Safety of Navigation	Secretariat	All
DTEC4	6.2.0.12.1	Annex to the Input paper on the Seminar on the Safety of Navigation	Secretariat	All
DTEC4	6.2.0.13	Input paper on the Seminar on VDES	Secretariat	All
DTEC4	6.2.0.13.1	Report on the Seminar on VDES	Secretariat	All
DTEC4	6.2.0.14	Input paper on RTCM SC139 standard	Stefan Pielmeier	WG1 WG3
DTEC4	6.2.0.14.1	Annex RTCM standard 13900.0	Stefan Pielmeier	WG1 WG3
DTEC4	6.2.0.15	Consideration regarding the proposal for the development of IALA's position on the WRC-27 agenda items	VTS57	All
DTEC4	6.2.1.1	Input paper on MSR	Fintraffic, AlVeNautics, GLA, SMA	WG1
DTEC4	6.2.1.1.1	Draft Guideline on MSR	Fintraffic, AlVeNautics, GLA, SMA	WG1

DTEC4	6.2.1.2	Information paper on the trust system of MCP	GLA, DLR, AIVeNautice	WG1
DTEC4	6.2.1.3	Report on MCP related work conducted in international projects_Sternula AS, AIVeNautics	Sternula A/S, AIVeNautics corp.	WG1
DTEC4	6.2.1.4	Report on MCP related work conducted in international projects_AIVeNautics	AIVeNautics corp.	WG1
DTEC4	6.2.2.1	Liaison note ENG to DTEC committee on digitalisation of waterways guideline	ENG19	WG2
DTEC4	6.2.2.2	Proposal for Developing a Guideline for Exchanging GNSS Interference Data	Fintraffic VTS, Kongsberg, DRL	WG2
DTEC4	6.2.2.3	Report on Task 7.1.2 Digitalization of waterways	TG 7.1.2	WG2
DTEC4	6.2.2.3.1	Draft Guideline on Digitalization of waterways v1.0	TG 7.1.2	WG2
DTEC4	6.2.2.3.2	Draft Guideline on Digitalization of waterways v2.0	TG 7.1.2	WG2
DTEC4	6.2.2.3.3	Draft Discussion paper on MASS-compatible AtoNs	TG 7.1.2	WG2
DTEC4	6.2.2.3.4	Draft Liaison note DTEC to ARM on MASS compatible AtoNs	TG 7.1.2	WG2
DTEC4	6.2.2.4	Proposal on further improving the content of digital waterway guideline	China MSA	WG2
DTEC4	6.2.2.4.1	Annex Draft IALA Guideline on digitalization of waterways	China MSA	WG2
DTEC4	6.2.2.5	Recommendations for updating the cybersecurity related chapters of the MASS Guideline	China MSA	WG2
DTEC4	6.2.2.6	Proposed Revisions to Recommendation ITU-R M.2092-1	China MSA	WG3
DTEC4	6.2.2.7	Input Paper on Progress Update for Task on Developing a Discussion Paper on Digitalisation in the Scope of IALA	Maritime and Port Authority of Singapore	WG2
DTEC4	6.2.2.8	Additional Notes of the Metal Surface Wave Technology (MS@MS)	KRISO	WG2
DTEC4	6.2.2.9	Additional Review of Radio-free wireless communication based on Metal Surface Wave in the maritime sector	KRISO	WG2
DTEC4	6.2.2.10	Liaison Note to DTEC on Update on Emerging Technology Review Final Version	VTS56	WG2

DTEC4	6.2.2.11	Liaison note to PAP and DTEC on Digitalisation of Waterways	ARM19	WG2
DTEC4	6.2.2.12	Response to the draft Guideline on Digitalization of Waterways	VTS57	WG2
DTEC4	6.2.2.13	Liaison note to all Committees on Development of IoT Guidance	ARM19	WG2
DTEC4	6.2.3.1	Draft Guidelines on VDES Resource Sharing	Atsushi KATO, Koichi YOSHIDA	WG3
DTEC4	6.2.3.2	Transmission of GNSS augmentation data over VDES	CML Mircocircuits	WG3
DTEC4	6.2.3.3	Proposal on Supplementing the Content of the New Guideline for VDES Service and Infrastructure	China MSA	WG3
DTEC4	6.2.3.4	Proposed Revision to Preliminary Draft of Recommendation ITU-R M.1371-5	China MSA	WG3
DTEC4	6.2.3.5	Input paper on AIS Performance using RHCP Ship Antenna	Kongsberg Discovery, Space Norway	WG3
DTEC4	6.2.3.6	Analysis on the options for retransmission of SBAS data through VDES	EUSPA, ESSP	WG3
DTEC4	6.2.3.7	Draft Guideline for Shore VDES Infrastructure	ALLFORLAND	WG3
DTEC4	6.2.3.8	Research on Resource Coordination System among AIS, ASM and VDE-TER for Improving Resource Utilization Efficiency	ALLFORLAND	WG3

### Working papers from DTEC3

Meeting	WP no.	Working Paper Title	Source	Action
DTEC3	11.2.1.6	Use cases for MCP Service Registry	WG1	to DTEC4
DTEC3	11.2.2.10	Draft Guideline on Innovation to implementation	WG2	to DTEC4
DTEC3	11.2.2.11	SADRMt review table	WG2	to DTEC4
DTEC3	11.2.2.12	Completed Review of Radio-free wireless communication	WG2	to DTEC4
DTEC3	11.2.2.13	Draft IALA Guideline on Digitalization of waterways	WG2	to DTEC4
DTEC3	11.2.2.14	Summary Note on New Technologies Reviewed after DTEC3	WG2	to DTEC4

**Output documents** are submitted to a body other than the Committee initiating the document for further review/action or as information.

Meeting	Output paper number	Output Paper Title	Source	Action
DTEC4	15.2.1	Liaison note to ARM on MRN Interessional work	WG1	ARM20
DTEC4	15.2.2	Liaison note to IEC on SECOM OpenAPI specification	WG1	Council
DTEC4	15.2.3	Liaison note to IEC on S-421 schema	WG1	Council
DTEC4	15.2.4	New draft Guideline on Maritime Service Registry Technical Specification	WG1	Council
DTEC4	15.2.5	Revised G1128 Ed1.7 Specification of e-Navigation Technical Services	WG1	Council
DTEC4	15.3.1	Liaison note to LAP on G1153 Review	WG2	LAP28
DTEC4	15.3.1.1	Annex G1153 Ed1.1-Review of Emerging Technologies	WG2	LAP28
DTEC4	15.3.2	Liaison note to ARM on IoT	WG2	ARM20
DTEC4	15.3.2.1	Revised G1179 Ed1.0 Introduction to IoT from an IALA perspective	WG2	ARM20
DTEC4	15.3.3	Liaison note to ARM on AtoNs support autonomous navigation	WG2	ARM20
DTEC4	15.3.3.1	Draft Discussion paper on AtoNs designed to support autonomous navigation	WG2	ARM20
DTEC4	15.3.3.2	Conference paper “What makes an AtoN MASS-compatible”	WG2	ARM20
DTEC4	15.3.4	Liaison note on S-100 AtoN Authority Perspective	WG2	ARM20 PAP57
DTEC4	15.3.4.1	WSV IMT Application Workshop	WG2	ARM20 PAP57
DTEC4	15.3.5	Liaison note on IALA Digitalisation Discussion Paper	WG2	ARM20 VTS58 ENG20 PAP57
DTEC4	15.3.6	Liaison note to VTS on Digitalisation of Waterways	WG2	VTS58
DTEC4	15.4.1	Information paper on VDES to MSC 10	WG3	Council
DTEC4	15.4.2	New draft Guideline on VDES authentication	WG3	Council
DTEC4	15.4.3	Draft Guideline on VDES signal measurement	WG3	Council

**Working papers** will remain within the Committee for further review during DTEC4.

Meeting	Agenda Item	Working Paper Title	Source	Action
DTEC4	15.5.1	S-100 from an Authority Perspective	WG2	to DTEC5
DTEC4	15.5.2	Draft IALA Guideline on Marine AtoN over IMT-2030	WG2	to DTEC5
DTEC4	15.5.3	G1178 Ed1.0 An intro to AI in IALA Domain	WG2	to DTEC5
DTEC4	15.5.4	Recommendations for updating the cybersecurity related chapters of the MASS Guideline	WG2	to DTEC5
DTEC4	15.5.5	Input Paper on Progress Update for Task on Developing a Discussion Paper on Digitalisation in the Scope of IALA	WG2	to DTEC5
DTEC4	15.5.6	Draft IALA Guideline on Digitalization of waterways	WG2	to DTEC5

*Action Items for the IALA Secretariat*

1. The **Secretariat** is requested to forward the Liaison note to IEC on SECOM OpenAPI specification (DTEC4-15.2.2) and Liaison note to IEC on S-421 schema (DTEC4-15.2.3) to the Council for approval.
2. The **Secretariat** is requested to forward the revised Guideline G1128 on Specification of e-Navigation Technical Services (DTEC4-15.2.4) to the Council for approval.
3. The **Secretariat** is requested to forward the new draft Guideline on the Maritime Service Registry (DTEC4-15.2.5) to the Council for approval.
4. The **Secretariat** is requested to publish the additional files (MSR OpenAPI.json, searcharea. geojson for the MSR guideline / ServiceInstanceSchema.xsd ) of the guideline G1128 on the IALA website.
5. The **Secretariat** is requested to forward the Liaison note on MRN intersessional work (DTEC-15.2.1) to the next session of the ARM committee.
6. The **Secretariat** is requested to forward the working paper DTEC4-15.5.5 related to the development of the MASS Recommendation and MASS Guideline to DTEC5 for further review.
7. The **Secretariat** is requested to forward the draft Guideline on Marine AtoN of IMT-2030 (DTEC4-15.5.2) to DTEC5 for further review.
8. The **Secretariat** is requested to publish the digital version of the MARCOM manual on the IALA website.
9. The **Secretariat** is requested to forward a Liaison note on the Digitalisation in the Scope of IALA (DTEC4-15.3.5) to ARM, VTS, ENG and PAP.
10. The **Secretariat** is requested to forward the working paper on Developing a Discussion Paper on Digitalisation in the Scope of IALA (DTEC4-15.5.6) to DTEC5 for further review.
11. The **Secretariat** is requested to forward a Liaison note on the Digitalisation of Waterways (DTEC4-15.3.6) to the VTS Committee.
12. The **Secretariat** is requested to forward a Liaison note on AtoNs specifically designed to support autonomous navigation (DTEC4-15.3.3) to the ARM Committee.
13. The **Secretariat** is requested to forward the working paper on developing guidance for the digitalization of waterways (DTEC4-15.5.7) to DTEC5 for further review.
14. The **Secretariat** is requested to forward a Liaison note on S-100 Aton Authority Perspective (DTEC4-15.3.4) to ARM and PAP.
15. The **Secretariat** is requested to forward the proposed new task on developing guidance for exchanging GNSS interference data in the updated Work Programme 2025-2027 to the Council for approval as appropriate.
16. The **Secretariat** is requested to forward the Liaison note on the Review of IALA G1153 (DTEC4-15.3.1) to LAP.
17. The **Secretariat** is requested to forward the working paper on G1178 Introduction to AI in the IALA Domain (DTEC4-15.5.3) to DTEC5 for further review.
18. The **Secretariat** is requested to forward a Liaison note on Development of Guidance on the use of simple IoT sensors on physical Aids to Navigation (DTEC4-15.3.2) to ARM for consideration.

19. The **Secretariat** is requested to forward the new draft Guideline on VDES Authentication Techniques (DTEC4-15.4.2) to the Council for approval.
20. The **Secretariat** is requested to forward the Information paper on VDES (DTEC4-15.4.1) to the Council for approval, and subsequently to IMO MSC according to the applicable MSC information paper input deadline.
21. The **Secretariat** is requested to forward the Draft Guideline on VDES Signal Measurements (DTEC4-15.4.3) to the Council for approval.

#### Action Items for Participants

22. **Japan Coast Guard** is requested to submit an input paper to DTEC5 to clarify the operational concept for the proposed new S-200 product specification on disaster management.
23. **Committee participants** interested in the task DTEC-7.1.15, are requested to contact Cdr Kinji Takeuchi ([takeuchi-s98d2@mlit.go.jp](mailto:takeuchi-s98d2@mlit.go.jp)) to share their views.
24. **Committee participants** interested in participating in the intersessional inter-committee meeting should contact Rasmus Madsen Jensen ([rmj@dma.dk](mailto:rmj@dma.dk)).
25. **The committee chair** is requested to raise the issue of responsibilities for the development of MRN guidance in the next session of PAP.
26. **Committee participants** are invited to submit input papers on the development of guidance on the MCP's decentralised trust system.
27. **Committee participants** are invited to submit input papers addressing IALA's potential role in establishing a certification scheme for MCP instances, as well as strategies for providing an operational instance of the MCP.
28. **Committee participants** are invited to join the intersessional task group meeting on the development of guidance on moving from innovation to implementation Guidelines, and contact Ernest Batty ([ernie.b@imisglobal.com](mailto:ernie.b@imisglobal.com)) on or before 1st May 2025 if they plan to attend.
29. **Committee participants** are invited to participate in the intersessional task group asynchronous meeting on the development of use cases for maritime in IMT-2030 and contact Hyounhee Koo ([koo@synctechno.com](mailto:koo@synctechno.com)) on or before 1st May 2025 if they plan to attend.
30. **IALA Member States** are encouraged to communicate with their delegates participating ITU-R Working Party 5D (WP5D) regarding their national maritime use cases for use of the IMT technologies.
31. **IALA Members** are asked to review the MARCOM Manual and provide comments, corrections, additions as appropriate using the MARCOM Manual Comment Form located on the IALA File Share.
32. **Committee participants** are invited to join the intersessional task group meeting on the Discussion Paper on Digitalisation in the Scope of IALA and contact Nicholas Chiew ([Nicholas\\_chiew@mpa.gov.sg](mailto:Nicholas_chiew@mpa.gov.sg)) on or before 14 August 2025 if they plan to attend.
33. **Committee participants** are invited to join the email correspondence group meeting on S-100 World from a Marine AtoN Authority perspective and contact Jan-Hendrik Oltmann ([Jan-hendrik.oltmann@wsv.bund.de](mailto:Jan-hendrik.oltmann@wsv.bund.de)) on or before 30th April 2025 if they plan to attend.
34. **Committee participants** are invited to join the intersessional task group meeting on Digitalisation of Waterways and contact Kaisu Heikonen ([kaisu.heikonen@ftia.fi](mailto:kaisu.heikonen@ftia.fi)) on or before 1st May 2025 if they plan to attend.

35. **VTS committee participants** are encouraged to consider attending the online inter-committee drafting meeting to be held 6 Nov. 2025 from 0900-1030 UTC.
36. **IALA Members** are asked to note the completion of the review of the MS@MS Technology.
37. **Committee participants** are invited to join the email correspondence group meeting on S-100 World from a Marine AtoN Authority perspective and contact Jan-Hendrik Oltmann ([Jan-hendrik.oltmann@wsv.bund.de](mailto:Jan-hendrik.oltmann@wsv.bund.de)) on or before 30th April 2025 if they plan to attend.
38. **IALA members** asked to note the completed review document on Ship Air Draft Remote Measurement Technology.
39. **IALA Members** are asked to note the completed review document on Qualcomm's 5G Precise Positioning for Ports.
40. **Committee participants** interested in contributing to the drafting work on an update of SN.1/Circ.289 are invited to contact Shuaiheng Huai per email to [huaishuaiheng@dlmu.edu.cn](mailto:huaishuaiheng@dlmu.edu.cn).
41. **Committee participants** are invited to submit the consequential updates to R1007 for DTEC5 and to work on a liaison note to IMO regarding the new guideline and the updated R1007 during DTEC5.
42. **Committee participants** interested in contributing to the work on the new guideline on VDES Authentication are invited to email the task group lead, Jan Safar, [jan.safar@qla-rad.org](mailto:jan.safar@qla-rad.org), to join the group.
43. **Committee members** are invited to support the European proposal at IMO MSC 110 to develop an R-Mode Performance standard.
44. **Committee members** are invited to participate in the intersessional meeting through correspondence to Koichi Yoshida [yoshida@rime.jp](mailto:yoshida@rime.jp).
45. **Committee Members** are invited to analyze methods to treat overlapping VDE-TER coverage and control station areas (indicated by bulletin board), including the proposed method in MSA-3, comparing the methods and trying to find an effective method balancing complexity in understanding, implementation, testing, training and operations to continue work during DTEC5.
46. **Committee Members** are invited to propose amendments to the IALA Guideline G1117 chapter on GNSS for the DTEC5 to provide more structure and overview of the different helping technologies for GNSS and how the architecture on shore and ship would need to look like to consume them. This change could include the proposed changes by ESSP, EUSPA and CML.

**Working Group 1****Digital Information Systems**

Chair – Jin Hyoungh Park, Aivenautics

Vice-chair – Julius Moeller, Australian Maritime Safety Authority

Last name	First name	Organization
Haagh	Oliver	AlVeNautics
Kirkedal Thomsen	Michael	DLR (and University of Copenhagen/University of Oslo)
Hong	Sunbae	Korea Maritime Cooperation Center
Bafana	Luthfi	Maritime and Port Authority
Li	Yang	Ministry of Transport of the People's Republic of China
Duret	Anne	Direction générale des affaires maritimes, de la pêche et de l'aquaculture, Secrétariat d'Etat chargé de la Mer
Armstrong	Patrick	US Coast Guard
de Bie	Gerrit Jan	Port of Rotterdam Authority
Takeuchi	Kinji	Japan Coast Guard
Strandberg	Michael	Danish Maritime Authority
Miraftabi	Ramin	Fintraffic Vessel Traffic Services Ltd
Olofsson	Mikael	Combitech AB (Saab)
Jensen	Rasmus Madsen	Danish Maritime Authority
Demir	Denizcan	HAVELSAN AS
Pitkanen	Juho	Fintraffic Vessel Traffic Services Ltd
Jaime	Alvarez	WWA
Lee	Wonhee	KRISO Korea Research Institute of Ships and Ocean Engineering
Christensen	Thomas	AlVeNautics
Kannos	Sirpa	Fintraffic Vessel Traffic Services Ltd
Hyun	Chaewon	Korea Maritime Cooperation Center
Meyer	Rhyno	IMIS Global Ltd

Chair – Jillian Carson-Jackson, Nautical Institute

Vice-chair – Dennis Khoo, Maritime and Port Authority

Last name	First name	Organization
Burton	Paul	UK Hydrographic Office
Carson-Jackson	Jillian	Nautical Institute
Chiew	Nicholas	Maritime and Port Authority of Singapore
Christians	Olaf	Airbus Defence and Space
Diamond	Clayton	American Pilots Association Inc
El Bacha	Taoufik	Saab TransponderTech
Heikonen	Kaisu	Finnish Transport Infrastructure Agency
Hernoe	Xavier	Direction Générale des Affaires Maritimes, de la Pêche et de l'Aquaculture (DGAMPA)
Hwang	Hun-Gyu	South Korea RIMS
Kambire	Hollo	Port Autonome d'Abidjan
Khoo	Dennis	Maritime and Port Authority of Singapore
Kim	Bu Young	KRISO Korea Research Institute of Ships and Ocean Engineering
Kim	Dong Hyun	South Korea RIMS
Liu	Jialin	China MSA
Nemoto	Yu	Japan Coast Guard
Oltmann	Jan-Hendrik	German Waterways and Shipping Agency
Park	Dayoung	Korea Maritime Cooperation Center
Pfeiffer	Michael	Danish Emergency Management Agency (DEMA)
Riendeau	Natacha	Canadian Coast Guard
Rostopshin	Dmitry	ICS TECHNOLOGIES s.r.l.
Saarnak	Christopher	Danish Emergency Management Agency (DEMA)
Soininen	Olli	Fintraffic Vessel Traffic Services Ltd
Stagira	Francesco	Italian Coast Guard
Varde	Damiano	Italian Coast Guard
Yoo	Ju Yeon	South Korea RIMS
Tachghou	Mohamed	Tangier City Port Management Company

Chair – Stefan Pielmeier, Sternula AS

Vice-chair – Stefan Bober, Germany, Federal Waterways and Shipping Administration

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Ho	Wing Kei	Maritime and Port Authority
Labushagne	Attie	CML Microcircuits
Moltsen	Lars	Sternula A/S
Svendsen	Mads S.	Sternula A/S
Yoshida	Koichi	Sasakawa Peace Foundation, Ocean Policy Research Institute
Xue	Feng	China Maritime Safety Administration
Yao	Gaole	China Maritime Safety Administration
Huai	Shuaiheng	Ministry of Transport of the People's Republic of China
Norsworthy	Ross	US Coast Guard
Istanbulu	Cafer Ozkan	IMO
Foster	Sean	US Coast Guard
Schultz	Johnny	US Coast Guard
Nishimura	Koichi	TST Corporation
Miyadera	Yoshio	Japan Radio Co., Ltd.
Lindborg	Johan	Saab TransponderTech
Alagha	Nader	European Space Agency
Na	Claire	ALLFORLAND
Kim	Lukas	ALLFORLAND
Batty	Ernest	IMIS Global Ltd
Fiorentino	Luca	ELMAN S.r.l.
Borghese	Francesco	ELMAN S.r.l.
Lee	Elly Seomgyeol	GMT Co Ltd
Watanabe	Hiroaki	IHI Corporation
Bronk	Krzysztof	National Institute of Telecommunications
Weibrecht	Jakob	Sternula A/S
Nyberg	Magnus	Saab TransponderTech AB
Jaafar	Shah Habidin Arib	Ministry of Transport Malaysia
Raulefs	Ronald	German Aerospace Centre
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