



IALA ENAV COMMITTEE

REPORT OF THE 24TH SESSION OF THE IALA E-NAVIGATION INFORMATION SERVICES AND COMMUNICATIONS (ENAV) COMMITTEE

7 to 11 October 2019

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11 October 2019

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International Association of Marine Aids to Navigation and Lighthouse Authorities
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Report of the 24th Session of the IALA e-Navigation Information Services and Communications (ENAV) Committee

Executive Summary

The 24th meeting of the ENAV Committee was held between the 7 and 11 October 2019 at IALA Headquarters. Hideki Noguchi was the Chair of the Committee and Jorge Arroyo Vice Chair. The Secretary for the meeting was Kevin Gregory.

91 Participants from 26 countries and four Sister organisations participated in ENAV24, 15 for the first time. There were two observers.

This was the third meeting for the 2018-2022 Work Programme and the Committee considered 61 input papers and produced 21 output papers from three Working Groups.

Key outputs included:

The completion of a new Recommendation on the provision of VTS and AtoN Maritime Services in the context of e-Navigation.

The completion of a new Guideline on a template for the review of emerging technologies for possible use by IALA members.

The following liaison notes were prepared:

- To Council to approve the following submissions to:
 - the IHO on web service-based S-100 data exchange; and
 - the IMO Navigation, Communications and Search and Rescue Sub Committee (NCSR) on 3GPP in the maritime domain.
- To the ARM Committee on AMRD and ITU related matters.
- To the ARM Committee and Steering Committee of the IALA Cyber Security Workshop on suggested workshop themes.
- To the ENG Committee on VDES R-Mode related matters.
- To the Policy Advisory Panel on the ENAV document structure.

Based on the Work Programme 2018 – 2022 the ENAV Task Plan was reviewed and updated.

Contents

Executive Summary	3
1. Introduction	6
1.1 Administrative announcements	7
1.2 Welcome from the Secretary-General	7
1.3 Approval of the agenda	8
1.4 Introductions and apologies	8
1.5 Programme for the week	8
2. Review of Action Items from ENAV23	8
2.1 Action Items – IALA Secretariat	8
2.2 Action Items – ENAV Committee Participants	8
3. Reports from other bodies.....	8
3.1 IALA Council	8
3.2 IALA Policy Advisory Panel	9
3.3 E-Navigation Underway	9
3.4 IMO	9
3.5 IHO	9
3.6 RTCM	9
3.7 ITU	9
3.8 3GPP	10
4. Presentations	10
4.1 Outcomes of the IALA R-Mode Workshop	10
4.2 VDES Testing at the North Pole	10
4.3 Australian Autonomous Vessels Forum	10
4.4 The implications of MASS on IALA activities	10
4.5 Expert meeting on the use of digital communication technology in VTS	10
4.6 Vessel-Shore Reporting	10
4.7 Digital@Sea 2020	11
4.8 IALA VTS and ENAV Symposium 2020	11
4.9 The use of e-Radar and e-Racon systems in Singapore	11
4.10 Status of WRC-23 new agenda item proposal to WRC-19	11
5. Any Other Business	11
6. Review of input papers	11
7. Establish Working Groups.....	12
8. Working Group 1 – Digital Information System (WG1)	12
8.1 Review of the Terms of Reference	12

8.2	System for Vessel Shore Reporting	13
8.3	Lay persons description of e-Navigation	13
8.4	IT / Web Services based S-100 data exchange	13
8.5	Provision Maritime Services in the domain of IALA	13
8.6	Cyber Security	14
9.	Working Group 2 – Emerging Digital Technology (WG2).....	14
9.1	Review of emerging technologies	14
9.2	Digital HF	15
9.3	Enhanced Real Time Positioning System (ERPS)	Error! Bookmark not defined.
9.4	Additional Technologies	15
9.5	Input and interaction with 3GPP	16
9.6	S-100 and VDES	17
9.7	Cybersecurity	17
9.8	Frequently Asked Questions (FAQ) on IALA website	17
9.9	Discussion on Maritime Autonomous Surface Ships (MASS)	19
9.10	Other items	19
10.	Working Group 3 – Digital Communication System (WG3)	19
10.1	Report and actions from ENAV23 and August Intersessional	19
10.2	Input for this meeting	20
10.3	ARM/ITU Matters	20
10.4	Revise G1139 – Technical Specification of VDES	21
10.5	E-Navigation documentation structure proposal	23
10.6	News update after WRC-19	24
10.7	Write a guideline on MASS	24
10.8	VDES Test plan	24
10.9	Revision and future of E-144, G1095 ASM Harmonization/alignment	Error! Bookmark not defined.
10.10	Working Group 3 intersessional meeting	24
11.	Work Programme (2018 – 2022)	24
12.	Review of output and working papers.....	24
13.	Review of session report.....	24
14.	Date and venue of next meetings.....	24
15.	Closing of the Meeting.....	25
16.	List of Annexes	25
ANNEX A	ENAV24 Committee Agenda	26
ANNEX D	List of input papers.....	41
ANNEX E	List of Output Documents and Working Papers.....	44

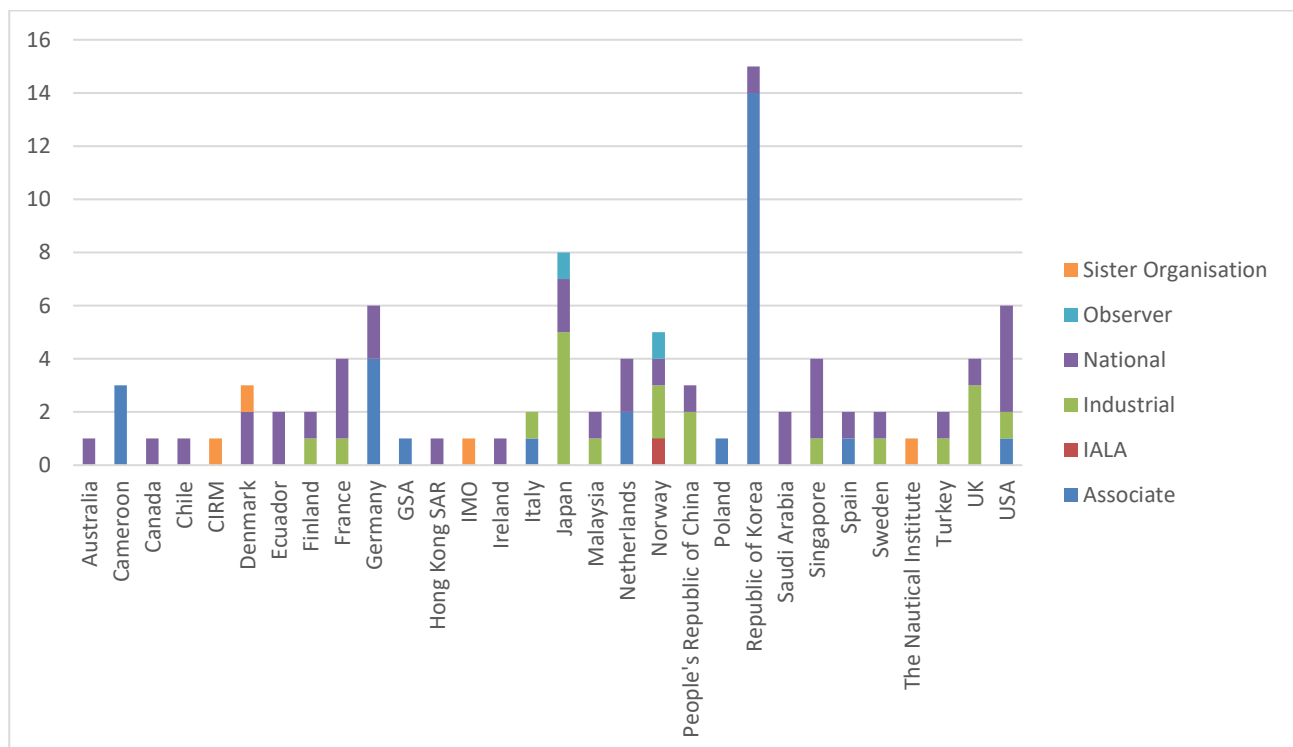
Report of the 24th Session of the IALA e-Navigation Information Services and Communications (ENAV) Committee

1. INTRODUCTION

The 24th meeting of the ENAV Committee was held between the 7 and 11 October 2019 at IALA Headquarters. Hideki Noguchi was the Chair of the Committee and Jorge Arroyo Vice-Chair. The Secretary for the meeting was Kevin Gregory.

91 Participants from 26 countries and four Sister organisations participated in ENAV24, 15 for the first time. There were two observers.

An analysis of the attendance at ENAV24 is in graph format below:



1.1 Administrative announcements

Paper ENAV24-1.1 (presentation) refers.

The Secretary provided Committee participants with safety and administrative information.

The following question was asked:

Does anyone present have the 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?

No patents were noted.

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

IALA has a policy regarding compliance with the General Data Protection Regulations. IALA will include a list of participants with their contact information in the report of this meeting. Any participant who wishes to remove their information from the participants list should advise the Committee Secretary as soon as possible.

1.2 Welcome from the Secretary-General

The Secretary-General welcomed all participants to Saint Germain-en-Laye and welcomed both new and returning participants. The Secretary-General thanked the Chair and Vice-Chair of the Committee for their hard work in preparing for this meeting and for facilitating the friendly and hardworking atmosphere for which the Committee is known. The Secretary-General also reflected on the successful ENAV Committee Meeting and Initial Operating Capability Phase for e-Navigation Services Workshop that were held in Singapore in April. Both events were extremely positive in promoting the operational capabilities of e-Navigation and we are grateful to the Maritime and Port Authority of Singapore for their efforts in hosting and for their hospitality.

This is a very busy period for IALA. The VTS and ENG Committees have met and the ARM Committee meets next week, it is the best time of the year for the Secretariat to have so many Committee participants attending the various meetings. The new Committee structure is now becoming established and all participants were thanks for their cooperation as the new arrangements were settling in. The VTS Committee finalised the revised IMO Resolution A.857(20) on Guidelines for Vessel Traffic Services at its recent meeting. This will change VTS completely in the future and, importantly, raises the status of the IALA Standards within the IMO and brings their importance closer to SOLAS.

The recent R-Mode workshop was a great demonstration of the cross-Committee working producing excellent results. Similarly, the recent e-Navigation Underway Asia Pacific event was excellently hosted by the Korean Ministry of Oceans and Fisheries. It was particularly pleasing to see the industrial members very active in the event and to see some results of e-Navigation application making seafarers lives easier, safer and more efficient.

There are a lot of interesting IALA events approaching, especially the Heritage Seminar which will take place alongside ENG11 in spring 2020. A workshop on the future of Marine Radio Beacon DGNSS will be held between the 27 and 31 January 2020 in Edinburgh, United Kingdom. The combined VTS and ENAV Symposium to be held between the 25 and 29 May 2020 in Rotterdam, the Netherlands. Registration will be open soon via the symposium website - www.iala-rotterdam2020.nl. An IALA Workshop on Cyber Security to be held between the 26 and 30 October 2020 in Quebec, Canada. Finally, the next IALA BATT/LITE event will take place in Australia in 2021. Participants should consider attending these interesting events.

A Diplomatic Conference will be held in Kuala Lumpur, Malaysia, in February 2020. This should be the final Diplomatic Conference where the participants will have the credentials from their respective Head of State to sign the final act of the new Convention for IALA paving the way for the change of status from a Non-

Governmental Organization to an Inter-Governmental Organization. This will result in IALA gaining the same status as organisations such as the IMO and IHO.

The Secretary-General wished all participants a fruitful week and reminded everyone that the Secretariat was ready to help in any way possible.

1.3 Approval of the agenda

The agenda was reviewed and adopted (ENAV24-1.3.1).

1.4 Introductions and apologies

The Chair welcomed the new participants of the Committee. Two apologies for absence were received.

See Annex B for the list of attendees, new participants and apologies.

1.5 Programme for the week

The Chair explained the programme for the week (ENAV24-1.5.1) which was adopted.

2. REVIEW OF ACTION ITEMS FROM ENAV23

Input paper ENAV24-2.1.1 refers.

2.1 Action Items – IALA Secretariat

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

2.2 Action Items – ENAV Committee Participants

The Chair reviewed the progress of the action items allocated to Committee Participants and noted that some input papers had been received associated with them which will be considered in the respective Working Groups.

3. REPORTS FROM OTHER BODIES

3.1 IALA Council

The highlights from document ENAV24-3.1.1 (report of Council 69) were presented to the Committee. The Council considered two important issues of relevance to the Committee, the future of DGNSS and a strategy workshop. The future of DGNSS will be further considered at a workshop in January 2020 to be held in Edinburgh.

The purpose of the workshop was to create a joint picture of possible future trends and global maritime developments, which are most likely to have an impact on IALA and how these may affect its priorities, structure and activities.

The workshop identified several important trends and developments, such as:

- the development of autonomous, automated and/or unmanned vessels;
- massive digitalisation, big data and associated risks such as cyber-security and information overload;
- the need for connectivity and interoperability of systems;
- the climate change and other environmental challenges;
- global economic developments and developments in trade patterns;
- the competition for utilizing the sea space and marine resources (MSP); and
- the demand for efficiency in the transport chain.

The Council also considered the proposal from the Japan Coast Guard to hold ENAV27 in Tokyo.

3.2 IALA Policy Advisory Panel

The 38th meeting of the Policy Advisory Panel (PAP), consisting of the Chairs and Vice-Chairs of all IALA Committees, met between the 11 and 13 September at IALA Headquarters. The PAP discussed several issues including the complementary use of AtoN for tsunami warning systems, the future of DGNSS, the revision of IMO Resolution A.857(20) on Guidelines for Vessel Traffic Services as well as cyber security issues. The PAP also considered the general coordination of activities between the Technical Committees.

3.3 E-Navigation Underway

E-Navigation Underway Asia Pacific was held between the 2 and 3 September 2019 in Seoul, Republic of Korea and was hosted by the Ministry of Oceans and Fisheries. A presentation (ENAV24-3.2.3) was given summarising the key outcomes of the meeting as well as providing information on the e-Navigation Capacity Building event which was run back-to-back with the e-Navigation underway event. The e-Navigation Underway Asia Pacific event for 2020 was introduced and it is hoped that this will take place in June to coincide with the Korea Maritime Week. The report of the e-Navigation Underway Asia Pacific conference is available as input paper ENAV24-3.2.3.1.

E-Navigation Underway North America will be held between the 12 to 13 November 2019 in Tampa, United States of America. An introductory presentation (ENAV24-3.2.4) was provided giving information on the conference arrangements.

The e-Navigation Underway International conference will not be held in 2020 but a new 'Digital@Sea' event will take place in January 2020.

3.4 IMO

The Committee noted reports from IMO MSC 101(ENAV24-3.3.2) and the verbal report provided on IMO Council 122. The MSC101 considered input papers from IALA concerning the revisions to IMO Resolution A.857(20) on Guidelines for Vessel Traffic Services and the establishment of the World Marine Aids to Navigation Day. The IMO Council endorsed the revised IMSAS schedule and, within IALA, the VTS and ARM Committees will update their respective guidance documents for auditors and auditees.

3.5 IHO

IALA and the IHO have regular technical cooperation meetings with the next due to take place during the ARM Committee. The agenda includes a range of matters related to charting requirements for new light characteristics, updates to the IHI GI Registry, MRN and matters related to S-100 and S-200 matters.

3.6 RTCM

Jorge Arroyo provided participants with an update on RTCM matters. The last meeting was in September which considered issues related to maritime autonomous surface ships and cyber security. A new Committee has been established to examine issues related to electromagnetic interference caused by LED technologies. Evidence of interference has been obtained and a laboratory has been established to conduct further tests.

3.7 ITU

Stefan Bober provided participants with an update on ITU activities with a full briefing provided in paper ENAV24-3.5.1. ITU-R Working Party 5B (WP 5B) considered issues related to the maritime mobile service including Global Maritime Distress and Safety System (GMDSS), aeronautical mobile service and radiodetermination service. The meeting was held between 29 April and 10 May 2019. This was the last meeting in the study cycle 2015 to 2019.

IALA had a specific interest in Maritime mobile service including Global Maritime Distress and Safety System (GMDSS) and radiodetermination service, with particular emphasis on the development of VDES, VDE-SAT, AIS and autonomous radio devices (AMRD) operating in the maritime VHF mobile band.

IALA had sent a Liaison Note regarding “IALA Maritime Radio Communications Plan (MRCP)” to the ITU WP 5B meeting in November 2018. Based on that input ITU WP 5B started working towards a draft new Report ITU-R [MAR-RADIO] “An overview of systems in the maritime mobile radiocommunication service and their mode of operation”. IALA was invited to further contribute to the work especially in the light of the results of WRC-19 which should be reflected in an updated document of IALA’s MRCP.

3.8 3GPP

The Deputy Secretary-General provided a presentation on the outcomes of a recent meeting with 3GPP (presentation ENAV24-3.5.5). The presentation highlighted that it may be beneficial to describe IALA members 5G requirements, identify other larger segments with similar requirements, join forces with the custodians of these segments and to work jointly with 3GPP and CIRM, as appropriate to adopt the requirements.

4. PRESENTATIONS

4.1 Outcomes of the IALA R-Mode Workshop

Paper ENAV24-4.1 (presentation) refers.

The presentation was given by Dr Stefan Gewies on the outcomes of the recent IALA workshop on R-Mode. The report of the workshop and associated documents can be found as input paper ENAV24-6.1.17.

4.2 VDES Testing at the North Pole

Paper ENAV24-4.2 (presentation) refers.

The presentation was given on behalf of Andreas Kjøl by Hans Haugli concerning practical testing of VDES at the North Pole by the Norwegian Coastal Administration.

4.3 Australian Autonomous Vessels Forum

Paper ENAV24-4.2 refers.

A verbal briefing was provided by Mahesh Alimchandani on the outcomes of the two-day Australian Autonomous Vessels Forum held in Canberra, Australia.

4.4 The implications of MASS on IALA activities

Paper ENAV24-4.4 (presentation) refers.

The presentation was given by Ørnulf Jan Rødseth from the Norwegian Forum for Autonomous Ships on the implications of MASS on IALA activities.

4.5 Expert meeting on the use of digital communication technology in VTS

Paper ENAV24-5.5 (presentation) refers.

The presentation was given by LCDR Mio Ando from the Japan Coast Guard on the recent international expert meeting on the use of digital communication technology in VTS. A copy of the meeting report and associated international presentations can be found as input paper ENAV24-6.1.1.

4.6 Vessel-Shore Reporting

Paper ENAV24-4.6 (presentation) refers.

The presentation was given by Boon Wee Teng from ST Engineering Electronics, Singapore, on vessel-shore reporting systems.

4.7 Digital@Sea 2020

Paper ENAV24-4.7 (presentation) refers.

The presentation was given by Linda Assel Hald presenting the Digital@Sea International conference to be held between the 28 and 30 January 2020 onboard a DFDS ferry from Copenhagen.

4.8 IALA VTS and ENAV Symposium 2020

Paper ENAV24-4.8 (presentation) refers.

The presentation was given by Maarten Berrevoets from the Netherlands Ministry of Infrastructure and Water management to provide Committee participants with an update on the arrangements for the forthcoming IALA VTS and ENAV Symposium to be held in Rotterdam between the 25 and 29 May 2020. A [copy of the invitation video can be found here](#).

4.9 The use of e-Radar and e-Racon systems in Singapore

Paper ENAV24-4.9 (presentation) refers.

The presentation was given by Weylin Tang from the Maritime and Port Authority of Singapore on the use of e-Radar and e-Racon systems in Singapore and the results of sea trials.

4.10 Status of WRC-23 new agenda item proposal to WRC-19

Paper ENAV24-4.10 (presentation) refers.

The presentation was given by Yoshio Miyadera from Japan Radio Company related to the status of a new agenda item proposal for WRC23 which will be made at WRC19.

The Chair thanked all speakers for the presentations and participants for their questions.

5. ANY OTHER BUSINESS

5.1 Review of IALA Model Course L1.4 on GNSS and e-Navigation

The Committee decided to commence a review of IALA Model Course L1.4 on GNSS and e-Navigation with a view to making it applicable to both operational managers within Marine Aids to Navigation Authorities as well as engineers responsible for implementing e-Navigation solutions. It was agreed that MPA Singapore, AMSA and the IALA World-Wide Academy would contribute to the review of the Model Course.

6. REVIEW OF INPUT PAPERS

Input papers were numbered in line with the agenda and allocated to the relevant Working Group.

The Committee had no comments on the list input papers as presented by the Secretary. All papers are available on the IALA website.

7. ESTABLISH WORKING GROUPS

The Chair invited all Working Group Chairs to introduce the work planned for ENAV24.

The Chair informed all participants that Working Groups 2 and 3 would be holding a joint workshop session on the afternoon of Tuesday 8 October.

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

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

The following activities were addressed during ENAV24 by Working Group 1.

8.1 Review of the Terms of Reference

Reference document: ENAV24-9.0

The document was reviewed by the Working Group. Several changes were proposed due to the fact of cross-cutting issues between different ENAV Working Groups and IALA Committees (especially ARM) and other organisations. In the opinion of the Working Group, it sees its tasks in the generic guidance and support of the development and implementation of digital information systems. Specific work on AtoN and VTS will be supported by this Working Group but naturally is in the responsibility of the dedicated committees.

Based on this the Working Group participants clarified the Terms of Reference of Working Group 1 as follows:

1. Provide guidance on the description and implementation of “Maritime Services in the Context of e-Navigation” (MS) to other committees, to support their work on AtoN and VTS and IALA’s role as a domain coordinating body.
2. Facilitate harmonization in the development of data models, technical services and platforms at IALA and other organizations, particularly the IHO S-100WG.
3. Define concepts, procedures, services and platforms for identity management (such as Maritime Resource Name (MRN) excluding its application on AtoN and VTS).
4. Develop, review and update IALA recommendations and guidelines on
 - the common maritime data structure (CMDs;
 - Maritime Services;
 - cyber security;
 - e navigation technical services;
 - connectivity platforms; and
 - MRN.
5. Support other committees in their development of S-2xx Product Specifications.
6. Organize workshops, seminars in support on these matters, as necessary.
7. Work with other Working Groups and liaise with other committees when necessary.
8. Submit a written report to plenary at the end of each session.

Action item:

*The **Chair and Vice-Chair of the ENAV Committee** are requested to coordinate the content of the terms of reference for Working Group 1 with the chairs of VTS, ARM, ENG and within PAP.*

8.2 System for Vessel Shore Reporting

Reference document: ENAV 24-6.15 System for Vessel Shore Reporting

The Working Group noted the input and the presentation at plenary with high interest. It was noted that referencing standards / MCP and its usage may enrich the document.

8.3 Lay persons description of e-Navigation

Reference documents: ENAV24-6.1.19, ENAV24-9.1

The Working Group noted the Liaison Note from VTS47 (ENAV24-6.1.19). The Working Group decided to seek further input and revise the document. A presentation is planned for the IALA VTS and ENAV Symposium in Rotterdam. The input from VTS committee will be used during further editing.

Action items:

*That **Committee Participants** are encouraged to contribute to the document 'a lay person's description of e-Navigation' (ENAV24-12.2.2) and to provide input to ENAV25.*

*The **IALA Secretariat** is requested to forward the document 'a lay person's description of e-Navigation' (ENAV24-12.2.2) as a working paper to ENAV25.*

8.4 IT / Web Services based S-100 data exchange

Reference document: ENAV24-6.1.6.

The Working Group agreed that IP / Web Service based data exchange is a core concept for the implementation of Maritime Services in the Context of e-Navigation and decided to prepare a Guideline based on the input paper to explain and encourage the online data exchange of S-100 and the usage of G 1128. The Working Group prepared a draft version of the Guideline and a Liaison Note to IHO S-100WG and IHO S-124 correspondence group to seek feedback for finalization of the Guideline.

Actions items:

*That **Committee Participants** are encouraged to contribute to the development of the draft Guideline on 'web services based on S-100 data exchange' (ENAV24-12.3.3) and provide input to ENAV25.*

*The **IALA Secretariat** is requested to forward the Draft Guideline 'Web Services based S-100 data exchange' (ENAV24-12.3.3.1) as a working paper to ENAV25.*

*The **IALA Secretariat** is requested to forward the Liaison Note to the IHO on the 'IALA Guideline on IP (Web Service) based S-100 data exchange' (ENAV24-12.3.3) and its associated draft Guideline (ENAV24-12.3.3.1) to the Council for approval and, following approval, to the IHO S-100 Working Group and the IHO S-124 Correspondence Group.*

8.5 Provision Maritime Services in the domain of IALA

Reference documents: ENAV24-6.9.2 and ENAV24-6.9.3.

The Working Group continued to work on IALA Recommendation and the Guideline for the Provision Maritime Services in the context of e-Navigation in the domain of IALA and on platforms for Maritime Services. These documents shall support members and other IALA committees in their work on the implementation of Maritime Services.

Action items:

*The **IALA Secretariat** is requested to forward the draft Recommendation on 'Maritime Services in the Domain of IALA' (ENAV24-12.3.1) to Council for approval.*

*The **IALA Secretariat** is requested to forward the draft Guideline on 'Platforms for Maritime Services' (ENAV24-12.2.1) as a working paper to ENAV25.*

*That **Committee Participants** are encouraged to contribute to the development of the draft Guideline on 'Platforms for Maritime Services' (ENAV24-12.2.1) and provide input to ENAV25.*

8.6 Cyber Security

Reference document: ENAV24-6.1.2

The Working Group welcomed the planned workshop on Cyber Security and sees this as an important contribution for the further reliable development of e-Navigation and a contribution to safety at sea. The Working Group reviewed the Council approved workshop proposal and proposed minor changes to extend the focus. The outcome was formulated in a Liaison Note coordinated with Working Group 2.

Action item:

The IALA Secretariat is requested to forward the Liaison Note on the IALA Cyber Security Workshop (ENAV24-12.3.2) to the ARM Committee and Workshop Steering Committee.

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

The Chair of the Working Group thanked all participants for their hard work during the week and to the Vice Chair, Ernie Batty, who stepped in to role at short notice.

9.1 Review of emerging technologies

The following inputs were reviewed: Wiki <http://wiki.e-navigation.nl/tiki-index.php>; ENAV24-6.1.20 (LTE); ENAV24-6.1.21 (LTE); ENAV24-6.1.9 (4G); ENAV24-6.1.10; ENAV24-6.1.15 (digital HF); ENAV24-6.1.15.1 (digital HF); ENAV24-6.1.8 (ERPS)

The template document for review of new and emerging technologies was reviewed and revised slightly. The resulting template was agreed to be published as a Guideline on 'template for review of emerging technologies for possible use by IALA members. The objective of this guideline is to encourage identification of existing or emerging technologies that may be of interest to evaluate and identify their advantages, limitations and applicability of these technologies in consideration of user requirements and needs of IALA membership.

Based on the review of the emerging technologies the WG reviewed the IALA Strategy Document 'Position on the development of Aids to Navigation Services' available at <https://www.iala-aism.org/content/uploads/2018/04/Position-on-the-development-of-AtoN-services-2017-12-15.pdf> It was recognised that the section of this document related to Digital Communication Strategies requires updating.

Action item:

The IALA Secretariat is requested to forward the draft Guideline Template for review of emerging technologies for possible use by IALA members (ENAV24-12.3.4) to IALA Council for approval.

The IALA Secretariat is requested to consider the process for updating the 'Position on the development of Aids to Navigation Services'.

9.1.1 Review of 4G (3GPP release 13)

The input regarding LTE and 4G was reviewed. It was noted that, within the context of the terminology used, LTE is considered an element of 4G. For more information on the structure and processes related to the work of 3GPP (see section 9.4 of the Report below).

WG 2 thanked the Republic of Korea and China for their submissions and ongoing work in this area. Although unable to be present at the meeting, the Author of the input from China participated remotely.

A detailed review of all input was carried out, and the template for assessment of emerging technologies was completed. It was deemed that 4G (3GPP release 13 and beyond) is a suitable candidate for further consideration in meeting the needs of IALA members. A summary of the review was provided in working paper ENAV24-12.2.5 Candidate Technology Review for 4G to be forwarded to WG3 for a more detailed technical review.

Action Item

The IALA Secretariat is requested to forward working paper on Candidate Technology Review for 4G (ENAV24-12.2.5) to ENAV25 for review by Working Group 3.

9.1.2 Digitization of VHF voice channels

The WG noted the task related to digital voice communications as presented in ENAV24-7.2. It is recognised that there are a number of options to implement voice over VHF, including digital Private Mobile Radio (dPMR) that uses Frequency Division Multiple Access (FDMA) and Digital Mobile Radio (DMR) that uses Time Division Multiple Access (TDMA) technologies.

P Hizey, representing the dPMR Association and author of the dPMR protocol, was present at the meeting to discuss dPMR. This enabled a detailed review of the technology using the IALA candidate technology review template.

Following the assessment of the technology, it was deemed that digital voice over VHF, using the example of dPMR, is a suitable candidate for consideration in meeting the needs of IALA members. A summary of the review, and all input documents received, were compiled into a folder and provided to WG3 for a more detailed technical review of the technology.

During the initial assessment of dPMR, WG2 identified that a suitable vocoder needs to be identified as a standard for maritime use to ensure interoperability. A summary of the review was provided in working paper ENAV24-12.2.6 Candidate Technology Review for Digital Voice over VHF (dPMR example) to be forwarded to WG3 for a more detailed technical review.

Action Item

The IALA Secretariat is requested to forward working paper on Candidate Technology Review for Digital Voice over VHF (dPMR example) (ENAV24-12.2.6) to ENAV25 for review by Working Group 3.

P Lane (CIRM) is asked to investigate existing use of vocoder(s) for maritime use and provide a report to ENAV25 with recommendations and justifications on suitable vocoder(s) for consideration in further review of this technology.

9.2 Digital HF

A presentation was provided on digital HF, noting the current implementation of a test bed in Korea. The presentation highlighted the specific use case of providing positional data which is being developed as an annex of ITU-R M.1798. It was noted that an update on the status and implementation of Digital HF will be provided at ENAV25.

In discussion, it was noted that:

- there are different international standards for digital HF. An example includes the 2G-ALE, based on MIL-STD 188-141A.
- commercial HF radios (mobile and fixed / base station) meeting this standard are available from equipment manufacturers.
- maritime HF frequencies have intercontinental range.

9.3 Additional Technologies

ENAV24-6.1.10 was reviewed, noting the technologies that had been brought to the attention of WG2 following ENAV23.

These include:

- Oneweb – announced global maritime shipping services at Nor-Shipping (<https://www.oneweb.world/media-center/oneweb-announces-global-maritime-services-at-nor-shipping>)
- LoRa / LoRaWAN – a low power-wide area network (LP-WAN) system that enables long transmission with limited power consumption. (<https://www.mdpi.com/2079-9292/8/1/15/htm> - tracking and

monitoring system based on LoRa Technology for lightweight boats; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6163321/> Experimental study of LoRa transmission over seawater).

- GSM Connect – LTE, 4G and 3G, recently announced by Navarino to provide GSM data service of up to 100Mbps to vessels within range of shore networks. (<https://smartmaritimenetwork.com/2019/07/25/navarino-adds-100mbps-gsm-option/>)

It was noted that the listed technologies can be used for proprietary maritime communications but may not address standardization or security aspects.

The Oneweb system is an example of a number of Low Earth Orbit (LEO) constellations which are being launched to provide connectivity. It was agreed that these LEO developments should be reviewed further.

LoRA / LoRaWAN is an existing capability that is being trialled and implemented in some areas. It was agreed that this technology should be reviewed further.

It was felt that GSM Connect is closely linked to the work already carried out on 4G and does not need further review at this time.

As there was no expertise in these technologies present within the WG, the items were noted. It is requested that members consider these, and other technologies, and provide input to ENAV25 using the template for review of emerging technologies (ENAV24-12.3.4).

Actions:

***J F Coutu** is requested to provide a review of LEO constellation developments, using Template for review of Emerging Technologies, and provide this for review at ENAV25.*

***K Heikonen** is requested to provide a review of LoRA / LoRaWAN, using the Template for review of Emerging Technologies, and provide this for review at ENAV25.*

*That **Committee Participants** are asked to provide input on the identified, and other, emerging technologies that may be suitable for use by IALA members and provide input and expertise to ENAV25.*

9.4 Input and interaction with 3GPP

The following inputs and references were reviewed: ENAV24-6.1.4; ENAV24-6.1.4.1; IALA Plenary Presentation on 3GPP; IMO/ITU EG 15/8 para 8.9; ENAV22-14 (report of ENAV22); 3GPP website <https://www.3gpp.org/>

The WG reviewed the liaison from 3GPP, which identified the process for forwarding the input from IALA to the appropriate body within 3GPP. The liaison note was a confirmation of the process in place and did not require a response.

Paragraph 8.9 of the report of the IMO/ITU Experts Group (IMO-ITU EG 15/8), under the heading “*Technical standardization for public mobile networks*”, was reviewed:

“8.9 During the ensuing discussion, the delegations that took the floor recognized that these were relevant developments and that IMO should be more proactive and get involved in the work of the 3rd Generation Partnership Project (3GPP). Noting that IALA had been approached already by 3GPP, the Group invited IALA to keep IMO informed of future developments.”

A response to IMO on the activity of 3GPP was prepared and agreed for forwarding to IMO, NCSR 7. The timing for input to this meeting requires silent approval process from IALA Council.

In the review of elements related to 3GPP the role of CIRM and the IALA Industrial members was highlighted. In particular, the WG highlighted the opportunities to explore possibilities for closer cooperation between IALA and CIRM on development of technical issues of mutual interest (e.g. 3GPP systems, and digital HF and VHF). This cooperation could include participation in CIRM working groups and technical meetings

Action item

The IALA Secretariat is requested to send the information paper on 3GPP (ENAV24-12.3.5) to IALA Council for e-mail approval and, following approval, to IMO NCSR 7.

P Lane (CIRM) is asked to coordinate with IALA on ways to ensure close cooperation on technical issues of mutual interest, including the participation in CIRM working groups and technical meetings.

9.5 S-100 and VDES

Presentations and discussion on the ship to shore service provision using S-100 series with VDES and as a consideration in the Common Shore Station Architecture (IALA G113 and G114 refer) was held in a combined WG2 / WG3 session.

9.6 Cybersecurity

The following inputs and references were reviewed: Input Papers – ENAV24-6.1.2; ENAV24-6.1.14; VTS47-3.1.10.

A presentation by the Korean Registry on cyber security highlighted that the risk of maritime cyber-attacks in the maritime domain is increasing globally, and the importance of maritime cyber security has emerged in the international community, such as International Maritime Organization (IMO), International Association of Classification Societies (IACS), Baltic and International Maritime Council (BIMCO), Oil Companies International Marine Forum (OCIMF). KR has developed a cyber security type approval program that can be applied to components and systems based on IEC 62443 4-2 and IEC 61162-460 standard. The IEC 62443 and IEC 61162-460 standards were introduced, with a focus on IEC 62443 3-3 (system security requirements and security level).

Following the presentation, the proposal for the IALA Cyber Security Workshop was reviewed. Comments were provided to Working Group 1, for inclusion in a liaison note to ARM and the Steering Committee for the IALA Workshop on Cyber Security.

9.7 Frequently Asked Questions (FAQ) on IALA website

The following inputs and references were reviewed: Input Papers – ENAV24-2.1.1; ENAV21-14.1.2; PAP34-18.1; input from IALA secretariat on use of IALA FAQ pages

At IALA ENAV21 the Committee prepared a liaison note to PAP to highlight the need for a frequently asked questions area on the IALA website (ENAV21-14.1.2, 22 September 2017). In that liaison, the Committee noted that the FAQ on e-navigation were last reviewed in September 2013 (ENAV14) and, since their publication in 2013, e-navigation has been developed and e-navigation solutions implemented.

A review of the IALA website identified that the ENAV FAQ have been removed. The only FAQ identified on the IALA website are the VHF Data Exchange System (VDES) FAQ, under 'Technical / Connectivity / VDES'.

The WG discussed the benefits of a FAQ area on the IALA website, including questions that cover all the activities under the remit of IALA.

9.7.1 Discussion

At ENAV24 the Committee reviewed the webpage statistics for the current VDES FAQ. The page has been visited approximately 3.5 thousand times in a period of 8 months, with an average time on the page of 2.5 minutes. This indicates that the FAQ is considered useful, and that persons visiting the page are taking the time to read content (Figure 1 refers).

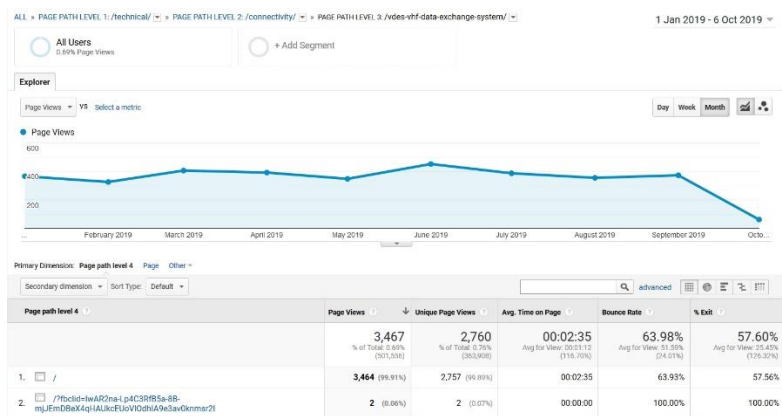


Figure 1 – Statistics on the use of the IALA VDES FAQ page (8 months)

The Committee in general was of the opinion that there is a need for a range of FAQ pages on various items addressed by IALA. This includes questions related to each of the IALA Committees (ARM, ENAV, VTS and ENG) as well as general questions on the work and structure of IALA. For example, under the ENAV Committee there could be a list of FAQs for topics such as VDES (existing); S-100, Maritime Services, and developing technologies. The implementation of the FAQ pages would require search engine optimisation (SEO).

Important considerations include:

- A logical and transparent structure for the FAQ;
- The presentation of the FAQ on the website;
- Provision of a print friendly version for the FAQ; and
- A defined period for review and update of content.

An effective FAQ area should improve the efficiency of IALA when responding to common questions.

9.7.2 Comments

Taking into account the growing need for reliable information to provide guidance, to enlarge awareness and for educational purposes, the Committee proposes:

- IALA implements a separate and specific, second level, area on the IALA website for FAQ. It is proposed that this be included under the heading 'About IALA'.
- The landing page for the FAQ should direct the reader to a specific topic area under the remit of IALA (i.e. each of the IALA Committees).
- Each FAQ list should have a user-friendly, logical and transparent structure, with a print friendly option;
- Where there is cross-over between key words or concepts, there is a hot link to that specific definition (i.e. similar to Wikipedia)
- This section should have the ability to provide statistics on the use of the FAQ pages (e.g. as currently available for the VDES FAQs on IALA's website).

9.7.3 Proposed Actions

- IALA creates a FAQ page under the 'About IALA' area of the website.
- The current VDES FAQ are moved to the new area of the website, and a print friendly version is prepared.
- The Committees are requested to develop FAQ for their areas of expertise and provide to the IALA Secretariat.
- The Committees review their FAQ on a regular basis, as an ongoing task, and provide updates to the Secretariat;

- Once a FAQ lists have been developed, it is anticipated that the review and update will require little effort by the relevant Committees;
- The Technical Department of the IALA Secretariat keeps a record of incoming questions (by phone or mail) and identifies these to the appropriate Committee for possible inclusion in the relevant FAQ lists;

Action Item

*The **IALA Secretariat** is asked to consider the implementation of an FAQ area on the IALA website and identify a suitable method to ensure content is provided by the Committees and maintained, to address the technical and logistical FAQs, as appropriate.*

9.8 Discussion on Maritime Autonomous Surface Ships (MASS)

The following inputs and references were reviewed: ENAV24-7.1; ENAV24-7.2.

A facilitated discussion session was held to identify areas related to MASS that may be of interest for IALA members. A mind map was developed, and a process for intersessional work was agreed. The mind map will be documented and developed further and be provided as input for ENAV25.

In discussion the work of IMO was noted, as well as a number of MASS trials. The work on this item will include reference to related international developments.

Action Item:

***E Batty** is asked to further develop the mind map, noting input through the intersessional electronic discussion process, and provide as input to ENAV25.*

9.9 Other items

9.9.1 Use of Wiki

The WG noted the value in using a secure Wiki to facilitate intersessional work between ENAV23 and ENAV24 for the review of emerging technologies. It was noted that IALA has a Wiki, which could be suitable for this purpose. IALA Secretariat demonstrated and discussed the use of the IALA Wiki.

Action Item

*The **IALA Secretariat** is requested to consider providing access to the protected area of the IALA Wiki for the use of IALA Committees, noting the specific use requirement of Working Group 2 in support of the review of emerging technologies.*

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

10.1 Report and actions from ENAV23 and August Intersessional

The Working Group reviewed the action items from ENAV23 and the August intersessional. All actions were found to be completed except:

Aug19/Action3: Availability of superseded documents for reference.

Action Item:

*The **IALA Secretariat** is requested to consider placing a note on the IALA website to state that superseded documents may be available upon request.*

Aug19/Action7: planned for WRC-19

Aug19/Action9: QPSK point specifications publishing: open. The group received a proper IPR statement from ESA on the QPSK point files. G1139 will refer to G1139-1 for the QPSK/CDMA sequence from G1139 edition 4 on.

Action Item:

The IALA Secretariat is asked to consider adding the QPSK point files 'G1139-1_QPSK_points.zip' to the edition 3 of G1139 on the IALA website page as document G1139-1.

Aug19/Action11: VDES Logo. Two proposals have been received. It was considered not to promote the use of a logo because of the risk:

- of the logo to be abused by producers not following the required test specs;
- of the logo indicating commercialization that might reduce shore authorities' willingness to invest in the technology; and
- that discussion might not be ended, but it came up that AIS led to the same discussions about a logo earlier.

However, following logo was found to have the most support from the Working Group:



Aug19/Action12: no response on registering VDES trademark, yet.

Aug19/Action13: VDE-SAT channelization and transmission structure through Wikipedia

Action:

The IALA Secretariat is requested to consider actions to ensure that the IALA IPR Wikipedia page is published correctly and linked from the IALA web and IALA Wikipedia pages.

10.2 Input for this meeting

The group reviewed the list of input papers and assigned them to the following work topics.

10.3 ARM/ITU Matters

10.3.1 ITU-R M.1371-5 Revision

Stefan Bober informed the Working Group that the IALA liaison Note submitted to the ITU from the 19 of April 2019 (ENAV23) has not yet been considered by ITU WP5B.

The Working Group prepared a Liaison Note for the ARM Committee related to a 'working document towards a preliminary draft revision of Recommendation ITU-R M.1371-5'.

Action items:

*That **Committee Participants** are invited to provide input to further revision of 'working document towards a preliminary draft revision of Recommendation ITU-R M.1371-5' (ENAV24-12.3.9.1) to the Chair of Working Group 3 before the 17 January 2020 for consideration at the intersessional meeting planned for February 2020.*

*That the **IALA Secretariat** forwards the Liaison Note on 'working document towards a preliminary draft revision of Recommendation ITU-R M.1371-5' to ARM10.*

10.3.2 Support ARM with regards to the development of Autonomous Marine Radio Devices (AMRD)

Input paper ENAV24-6.1.7.1 was reviewed and a Liaison Note to the ARM Committee was drafted.

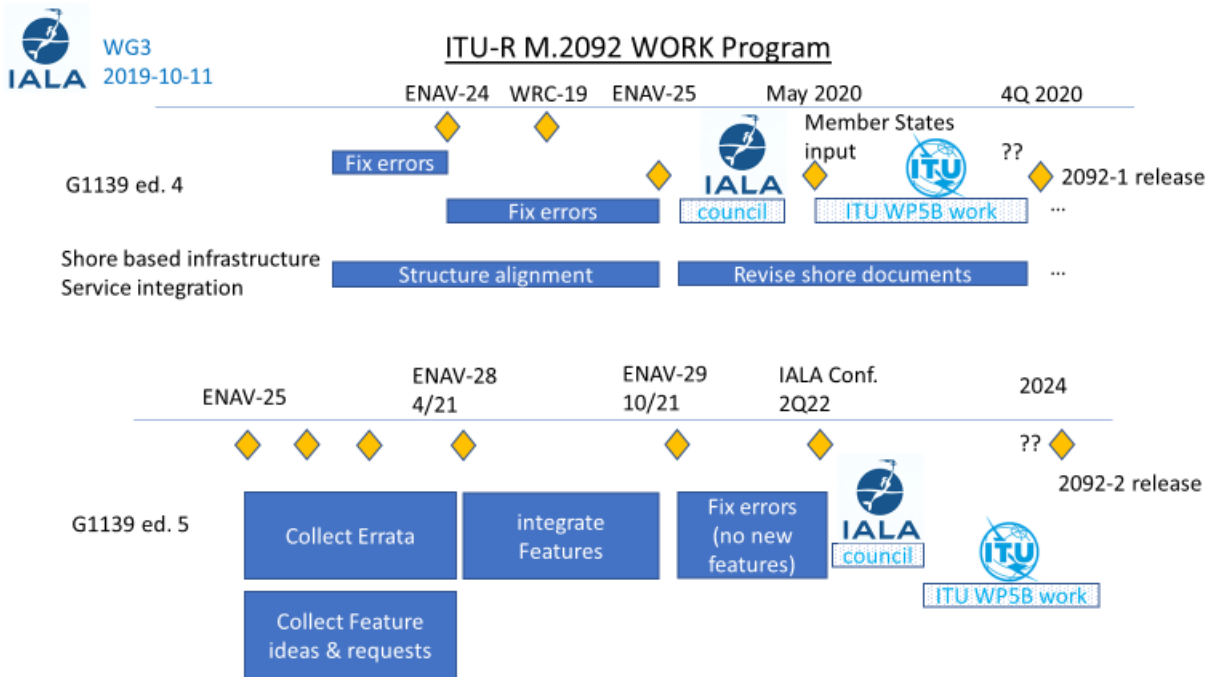
Action item:

*The **IALA Secretariat** is requested to forward the Liaison Note on Assignment and use of identities in the maritime mobile service for AMRD Group B (ENAV24-12.3.6) to ARM10.*

10.4 Revise G1139 – Technical Specification of VDES

10.4.1 Process

As decided by the August intersessional meeting, following process applies regarding VDES work progress:



10.4.2 Input papers

Following input papers and proposals received from the Working Group 3 G1139 Change Log (ENAV24-12.2.7) were reviewed by the Working Group. Documents referred to that are not ENAV24 input papers may be found on the Working Group 3 file share. Access to the file share may be obtained from the IALA Secretariat or via the Chair of Working Group 3:

- Proposal from Pieter Winter to discuss the situation where multiple base stations can be seen by a ship terminal
- 20190918_G1139_CP_0_PieterWinter.docx
 - The group acknowledges the proposed mechanism as appropriate. The action to include it into G1139 is awaiting proposals for pre-defined bulletin boards. The group agrees on keeping the proposal open until we have pre-defined bulletin boards available that we can use together with the proposed method.
- ENAV24-6.1.13 design of VDES testbed (KR), together with WG1 and WG2
 - Juntae Kim presented the presentation PRESENTATION/ design_VDES_TestBed_GW_Smart-Navigation_Project_20190926_v2.pptx
- ENAV24-6.1.11 VDES requirement to carry S100 (JF), together with WG1 and WG2
 - Ernie Batty presented “Ship to shore service provision using S-100 series...” introducing the group to the S-2XX documents and the architecture behind transport of services using S-100 architecture, read G-1113 and 1114 Common Shore Side Architecture.
 - Jean François presents ENAV-6.1.11, the motivation of Canadian Coast Guard to use S-100 to transfer maritime services to ships through the dedicated maritime digital communication means (AIS, ASM, VDE-SAT, VDE-TER and NAVTEX/DAT); push is a use case; Axel Hahn noted that S-100 doesn’t require to be transported as files, data can be

transported more efficiently, see S-100 Dec 2019 1.4.0.0 chapter 14 (online data). Jean-François notes that in phase 1, Canada plans to only use broadcast shore to ship.

- 20190918_G1139_CP_1_PieterWinter.docx
 - The group accepted this change proposal, see WD_changelog.
- 20190905_G1139_CP_2_PieterWinter.docx
 - The group accepted this modified change proposal, see WD_changelog. 50kHz channel bandwidth is for future use.
- 20190922_G1139_CP_1_RR.docx (DLR)
 - Based on this change proposal to make 25 and 50 kHz channel bandwidth mandatory again, the group decided to modify 20190905_G1139_CP_2_PieterWinter.docx to only make 50kHz bandwidth to be for future use and keep 25kHz mandatory. The decision is based on the need to adapt to difficult propagation conditions.
- The group received a presentation of ENAV24-6.1.16 was presented by Karel Callewaert. The project is not connected with the Norsat-2 trials on EGNOS.
- ENAV24-6.1.12 Initial VDES Sea trial and test plan (KR) was presented by Juntae Kim, explaining the first results (< 1% PER on 25kHz ASM and VDE-TER channels).
- 20190906_IEC_WG15_MTG32_O_005_Liasison_note_to_IALA_on_G1139.docx
 - Proposal 1 is accepted
 - Proposal 2 was taken back by IEC representative in the meeting
 - Proposal 3 is accepted
 - Proposal 4 needs rework by IEC to incorporate avoidance to relay AIS messages that are too old. Stefan Bober will feedback to IEC on that topic.
 - Proposal 5 is accepted by the group.
- 20190923_G1139_CP_1-5_JHKIM.docx
 - All 5 editorial change proposals are accepted by the group.
- 20190923_G1139_CP_6_JHKIM-1.docx
 - The group accepted the change proposal with the changes applied during the session.
- 20191007_G1139_CP_item67_exactEarth.docx (EA)
 - The group reviewed the change proposal but cannot agree to it as there are questions that need answering by EA (absent) first.
- 20190919_G1139-3_Problems_Krontech_ver.3_YB commented WG3.docx (KT)
 - We worked through all open items in that (working) document, solved some of them and forwarded some to Kongsberg for answering at the intersessional in February.
- ENAV-6.1.24 The VDES network protocol 10-02 (China MSA)
 - This input will be handled by Working Group 3 when starting to work on shore infrastructure documentation from ENAV25 on. The document is retained as a working document.
- 20191009_G1139_KSX1_BulletinBoard_v2.docx
 - This is approved in the edited version
20191009_G1139_KSX1_BulletinBoard_v3_edited_by_WG3.docx

These changes will be applied on top of this version 'WORKING/20190919_Revisions to G1139 Rev_3.docx'. The change log 'WORKING/20191010_G1139_WD_changelog.xlsx' was used to track all updates, agreed

actions and open issues. As per the agreed process (see Intersessional August 2019 report, section 10.10, ENAV24-6.1.7), work commences on G1139 edition 4 until after WRC-19.

The next deadline for Change Proposals to fix errors in G1139 is the 17 of January 2020.

Action Items:

*That **Committee Participants** are asked to provide a change proposal on limiting the number of receivers and transmitters in the context of G1139 to the Chair of Working Group 3 for discussion at the February intersessional meeting before the 17 January 2020.*

*That **Committee Participants** are invited to note the development process for G1139 and review the G1139 changelog and submit change proposals for the coming intersessional meeting not later than 17th of January 2020 to the [Working Group 3 intersessional file share](#) or directly to the Chair of Working Group 3.*

10.4.3 Patents

The group received intelligence that there is a Chinese patent from 2017 on [Light-duty deployable VDES array antenna](#). The group identified prior art to this patent in the Norsat-2 deployable antenna published in April 2017 through https://www.youtube.com/watch?v=222J_-4aqGU.

More patents were identified by Geir Jegstad's IPR analysis to be found in OUTPUT/20191010_IPR_VDES_update.docx.

Having reviewed the available information, including that on the IALA WIKI, it was determined that there were no immediate concerns to address.

Action Items:

*That **Committee Participants** are requested to provide VDES patent information to the Chair of Working Group 3 for discussion at the intersessional meeting before 17 January 2020.*

10.4.4 Support of R-Mode in VDES

The group discussed which changes need to be made to G1139 in order to accommodate R-mode over VDES in the future. The R-mode service will need to be described in a guideline explaining how to create a system using VDES to transport the R-mode service. Pieter will provide a change proposal describing the necessary changes to G1139 for the February Intersessional meeting.

Action Items:

*The **IALA Secretariat** is requested to forward the Liaison Note on VDES R-Mode and its accompanying draft Guideline on VDES R-Mode (ENAV24-12.3.7 and ENAV24-12.3.7.1) to ENG11.*

10.5 E-Navigation documentation structure proposal

Together with Working Group 2, the document related to 'e-Navigation documentation structure V2' was reviewed.

The Working group decided that a Liaison Note to PAP is required to receive full feedback.

Action items:

*The **IALA Secretariat** is requested to forward the Liaison Note on the 'Proposed e-navigation documentation architecture & update' (ENAV24-12.3.8) to PAP for review.*

10.6 News update after WRC-19

The Working Group prepared a draft news update paragraph that can be used by IALA and members to announce the completion of frequency assignments for VDES including VDE-SAT after WRC-19 subject to the official approval of the VDE-SAT frequencies.

Action item:

*The **IALA Secretariat** is requested to consider publishing a news release (ENAV24-12.2.4) following the approval by WRC-19 of the VDE-SAT frequencies.*

10.7 Write a guideline on MASS

The Chair of the ENAV Committee informed the Working Group that work on a draft Guideline on MASS has commenced and that it may be reviewed at ENAV25.

10.8 VDES Test plan

During the August 2019 Intersessional, the group proposed to take action on designing a test plan for VDES.

10.9 Working Group 3 intersessional meeting

An intersessional meeting of Working Group 3 will take place between 1300 on the 3 February and 1200 on 7 February at the DLR premises in Oberpfaffenhofen/Wessling, Germany. The point of contact for the intersessional meeting is the Chair of Working Group 3, Stefan Pielmeier (sp@albatros-tech.eu).

11. WORK PROGRAMME (2018 – 2022)

From the Council approved work programme (ENAV24-7.1) a detailed Task Plan for the work period 2018 – 2022 was reviewed. It will be used as working document for future ENAV Committee meetings. As such it is not needed to get Council approval for updates of the Task Plan.

Action item

*The **IALA Secretariat** is requested to forward the Task Plan 2018 – 2022 to ENAV25 (ENAV24-12.2.7).*

12. REVIEW OF OUTPUT AND WORKING PAPERS

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

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

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

13. REVIEW OF SESSION REPORT

The report of the meeting (ENAV24-13.1) was reviewed and approved by the Committee.

Action Item:

*The **IALA Secretariat** is requested to send the report of ENAV24 (ENAV24-13.1) to the IALA Council to note.*

14. DATE AND VENUE OF NEXT MEETINGS

ENAV25 will be held between 16 and 20 March 2020 at IALA Headquarters, Saint Germain-en-Laye, France.

Committee participants were reminded of the following IALA events:

- IALA Workshop on the future of Marine Radio Beacon DGNSS to be held between the 27 and 31 January 2020 in Edinburgh, United Kingdom.

- The combined VTS and ENAV Symposium to be held between the 25 and 29 May 2020 in Rotterdam, the Netherlands. Registration will be open soon via the symposium website - www.iala-rotterdam2020.nl.
- Joint IHO/IALA workshop on S-100/S-200 development and portrayal in June 2020 in Norway.
- IALA Workshop on Cyber Security to be held between the 26 and 30 October 2020 in Quebec Canada.

Other IALA events will be publicised on the IALA website.

15. CLOSING OF THE MEETING

The Chair thanked again all Committee participants for all their hard work and accomplishments during the meeting.

The Chair hoped to see all participants at ENAV25 in March.

16. LIST OF ANNEXES

- 1 Agenda
A copy of the agenda is at Annex A.
- 2 Participants
A list of participants is at Annex B.
- 3 Working Group Participants
A list of working group participants is at Annex C.
- 4 Input Papers
A list of input papers is at Annex D.
- 5 Output and Working papers
A list of output and working papers is at Annex E.
- 6 Action Items
A list of action items is at Annex F.



24th Meeting of the e-Navigation Information Services and Communications Committee (ENAV24)

The 24th meeting of the **ENAV Committee** will be held from 7 – 11 October, at IALA Headquarters, Saint-Germain-en-Laye, France.

The opening plenary will commence at 1300 on Monday 7 October 2019, and the closing plenary will end at approximately 1300 on Friday 11 October.

Committee Chair, Vice-Chair and Working Group Chairpersons are requested to meet at 0900 on Monday 7 October.

Agenda

1. Introduction
 - 1.1. Administration and Safety Briefing
 - 1.2. Welcome from the Secretary-General/Deputy Secretary-General
 - 1.3. Approval of agenda
 - 1.4. Apologies and introductions
 - 1.5. Programme for the week
2. Review of action items from last meeting
 - 2.1. Review of action items from ENAV23
3. Reports from other bodies:
 - 3.1. IALA
 - 3.1.1. IALA Council Minsu Jeon
 - 3.1.2. Policy Advisory Panel (PAP) Minsu Jeon
 - 3.1.3. IALA World-Wide Academy Kevin Gregory
 - 3.2. E-Navigation Underway
 - 3.2.1. International
 - 3.2.2. North America Minsu Jeon
 - 3.2.3. Asia Pacific Min-gi Kim
 - 3.3. IMO
 - 3.3.1. IMO Council Minsu Jeon
 - 3.3.2. IMO MSC Hideki Noguchi
 - 3.3.3. IMO NCSR
 - 3.4. IHO
 - 3.5. ITU
 - 3.5.1. ITU-R WP5B Stefan Bober
 - 3.5.2. IMO-ITU Joint Experts Group Jorge Arroyo
 - 3.5.3. RTCM Jorge Arroyo
 - 3.5.4. ETSI Derek Love
 - 3.5.5. 3GPP Omar Frits Eriksson

4. Presentations
 - 4.1. Outcomes of the IALA R-Mode Workshop Stefan Geweis
 - 4.2. VDES testing at the North Pole Andreas Kjøl
 - 4.3. Australian Autonomous Vessels forum Mahesh Alimchandani
 - 4.4. The implications of MASS on IALA activities Ørnulf Jan Rødseth
 - 4.5. Expert meeting on the use of digital communication technology in VTS LCDR Mio Ando
 - 4.6. Vessel-Shore Reporting Teng Boon Wee
 - 4.7. Digital@Sea Linda Assel Hald
5. Any Other Business
6. Review of input papers
 - 6.1. Introduction of input papers to ENAV24
 - 6.2. Allocation of input papers
7. Work Programme and task list (2018 - 2022)
8. Establish Working Groups
9. WG1 – Digital Information System
10. WG2 – Emerging Digital Technology
11. WG3 – Digital Communication System
12. Review of output and working papers
 - 12.1. Working Group reports
 - 12.2. Working papers
 - 12.3. Output papers
13. Review of session report
14. Date and venue of next meeting
15. Close of the meeting

ANNEX B**ENAV24 PARTICIPANTS****Country**

ENAV Chair	Japan Coast Guard CDR Hideki NOGUCHI Japan e-mail: jcghkokugikaihatsu1-6r9i@mlit.go.jp
ENAV Vice chair	US Coast Guard Mr Jorge ARROYO USA e-mail: jorge.arroyo.uscg@gmail.com
WG 3 Vice chair	Federal Waterways & Shipping Administration Mr Stefan BOBER Germany e-mail: stefan.bober@wsv.bund.de
WG1 Chair	Offis EV Dr Axel HAHN Germany e-mail: hahn@wi-ol.de
WG1 Vice chair	Korea Research Institute of Ships & Ocean Engineering (KRISO) Dr Jin Hyoung PARK Republic of Korea e-mail: jin.h.park@kriso.re.kr
WG2 Chair	Nautical Institute Mrs Jillian CARSON-JACKSON Australia e-mail: jillian@jcjconsulting.net
WG2 Vice chair	Senro/IMIS Global Limited Mr Ernest BATTY UK e-mail: ernie.b@imisglobal.com
WG3 Chair	RTCM Mr Stefan PIELMEIER Denmark e-mail: stefan@symlinux.com

Australia	Australian Maritime Authority Mr Mahesh ALIMCHANDANI Australia e-mail: Mahesh.Alimchandani@amsa.gov.au
Cameroon	Autorité Portuaire Nationale Mrs Nadine EPARA Cameroon e-mail: nadineepara@yahoo.fr Autorité Portuaire Nationale Ms Marie Christelle FOE AMBANI Cameroon e-mail: christellefoe@gmail.com Autorité Portuaire Nationale Mr Gabriel TOUNOCK Cameroon e-mail: apn@camnet.cm
Canada	Canadian Coast Guard Mr Jean-François COUTU Canada e-mail: jean-francois.coutu@dfo-mpo.gc.ca
Chile	Armada de Chile - Directemar Captain Italo SOLARI Chile
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Ornulf Rodseth	Norwegian Forum of Autonomous Ships
Zijun Wang	CSIC PRIDe
Julius Möller	OFFIS EV
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Min-Gi Kim	Ministry of Oceans & Fisheries
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Seunghyun Choi	Korea Register of Shipping
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13.	Javier Yashikouski	IMO
14.	LeeAnne Gordon	NGA / USA
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5.	Jeoug Kyu Lim	Korean Register
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16.	Pierre mingot	Cerema / France
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18.	Hans Haugli	Space Norway
19.	Ross Norsworthy	United States Coast Guard
20.	Patrick Gallagher	United States Coast Guard
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33.	Jiman Shin	Korean Register
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37.	Jeonghyeon Kim	Korean Register
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ANNEX D

LIST OF INPUT PAPERS

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

Meeting	Agenda Item	Input Paper Title	Source	Presented by / WG
ENAV24-	1.3.1	Agenda ENAV24 20190716	IALA Secretariat	Plenary
ENAV24-	1.5.1	ENAV24 Programme for the week	IALA Secretariat	Plenary
ENAV24-	2.1.1	ENAV23 Action Items	IALA Secretariat	Plenary
ENAV24-	2.1.2	Report of ENAV23	IALA Secretariat	Plenary
ENAV24-	3.1.1	Report Council 69 Final	IALA Secretariat	Plenary
ENAV24-	3.2.3.1	2019 ENUW AP Conference Highlights	IALA Secretariat	Plenary
ENAV24-	3.3.2	IALA report on MSC101	IALA Secretariat	Plenary
ENAV24-	3.5.1	IALA Report of ITU-R WP5B meeting May 2019	Stefan Bober	Plenary
ENAV24-	6.1.1	JCG meeting - digital communication in VTS	Japan Coast Guard et al	Plenary
ENAV24-	6.1.1.1	Report of Expert Meeting	Japan Coast Guard et al	Plenary
ENAV24-	6.1.1.2	Annex 1 List of participants	Japan Coast Guard et al	Plenary
ENAV24-	6.1.1.3	Annex 2 Presentation of Australia	Japan Coast Guard et al	Plenary
ENAV24-	6.1.1.4	Annex 3 presentation of Norway	Japan Coast Guard et al	Plenary
ENAV24-	6.1.1.5	Annex 4 presentaion of Singapore	Japan Coast Guard et al	Plenary
ENAV24-	6.1.1.6	Annex 5 presentation of US	Japan Coast Guard et al	Plenary
ENAV24-	6.1.1.7	Annex 6 presentation of Japan	Japan Coast Guard et al	Plenary
ENAV24-	6.1.2	IALA Workshop on Cyber Security	IALA Secretariat	Plenary
ENAV24-	6.1.3	IALA e-Navigation IOC Workshop Report	IALA Secretariat	Plenary
ENAV24-	6.1.4	Reply Liaison Statement on IAIA liaison on the update of 3GPP Release 16 Stage 1 MARCOM standardization	3GPP	WG2
ENAV24-	6.1.4.1	3GPP MARCOM S1-192709 revision of S1-192402 of S1-192042-CR for TS 22.119	3GPP	WG2
ENAV24-	6.1.5	System for Vessel Shore Reporting	ST Engineering Electronics and MPA Singapore	Plenary
ENAV24-	6.1.6	Secure IP based communication for MSI (S-124)	Sibylle Fröschle, Axel Hahn, Julius Möller, Jin H. Park	WG1
ENAV24-	6.1.7	WG3 Intersessional Meeting Report	WG3 Intersessional	WG3
ENAV24-	6.1.7.1	ITU WP5B assignment and use of identities in the maritime mobile service	WG3 Intersessional	WG3
ENAV24-	6.1.7.2	Review of eNavigation documentation structure V2	WG3 Intersessional	WG3/WG2

ENAV24-	6.1.8	Enhanced Real-time Positioning System (ERPS)	MPA Singapore	WG2
ENAV24-	6.1.9	Initial review of 3GPP 4G	Korea Research Inst. of Ships & Ocean Eng.	WG2
ENAV24-	6.1.10	Candidate Technologies input - draft vs2	Chair WG2	WG2
ENAV24-	6.1.11	Canada - VDES requirement to carry S-100 products	Canadian Coast Guard	WG3/WG2
ENAV24-	6.1.12	Initial VDES sea trial and test plan under Smart-Navigation Project	Korean Register	WG3/WG2
ENAV24-	6.1.13	The design of VDES testbed and gateway under Smart-Navigation Project	Korean Register	WG3/WG2
ENAV24-	6.1.14	WG2 - Introduction of cyber security type approval applicable case based on IEC 62443 and IEC 61162-460 standards	Korean Register	WG2
ENAV24-	6.1.15	WG2 Introduction of Digital HF Communication System in SMART Navigation Project	Korean Register	WG2
ENAV24-	6.1.15.1	Annex 1 Characteristics of HF radio equipment for the exchange of digital data	Korean Register	WG2
ENAV24-	6.1.16	European GNSS capabilities for improving maritime safety and security with VDES	European GNSS Agency	WG2
ENAV24-	6.1.17	Report on the IALA Workshop on R-Mode	IALA R-Mode Workshop	WG3
ENAV24-	6.1.17.1	R-Mode Roadmap 2019	IALA R-Mode Workshop	WG3
ENAV24-	6.1.17.2	R-Mode MindMap	IALA R-Mode Workshop	WG3
ENAV24-	6.1.17.3	R-Mode Stakeholders	IALA R-Mode Workshop	WG3
ENAV24-	6.1.17.4	Draft Guideline xxxx on R-Mode Implementation using MF radio beacon and VHF transmissions	IALA R-Mode Workshop	WG3
ENAV24-	6.1.18	GLA - VDES R-Mode Development	GRAD - Dr Jan Šafář	WG3
ENAV24-	6.1.18.1	GLA - VDES R-Mode Technical Report v1.0 - public	GRAD - Dr Jan Šafář	WG3
ENAV24-	6.1.19	Liaison note to ENAV24 on a lay persons description of e-Navigation	VTS47	WG1
ENAV24-	6.1.20	Initial Assessment of LTE by china	WTI China	WG2
ENAV24-	6.1.21	Summary of LTE Private Network for the Yangtze River Estuary E Navigation Construction Project	WTI China	WG2
ENAV24-	6.1.22	Liaison Note to All Committees on Tidal Display Signal System (ENG10-14.2.5)	ENG10	Plenary

ENAV24-	6.1.22.2	Annex 1 - Draft Guideline on Tidal Current Signal System (ENG10-14.2.5.1)	ENG10	Plenary
ENAV24-	6.1.23	WP Draft Guideline on R-Mode Implementation Using MF Radio Beacon and VHF Transmissions Post Workshop (ENG10-14.3.6)	ENG10	WG3
ENAV24-	6.1.23.1	WP Mind Map R-Mode (updated) Review 04.10.2019 (ENG10-14.3.6.1)	ENG10	WG3
ENAV24-	6.1.23.2	WP R-Mode Roadmap (ENG10-14.3.6.2)	ENG10	WG3
ENAV24-	6.1.23.3	WP R-Mode Roadmap 2019 (ENG10-14.3.6.3)	ENG10	WG3
ENAV24-	6.1.23.4	WP R-Mode Stakeholder Requirements Post ENG10 (ENG10-14.3.6.4)	ENG10	WG3
ENAV24-	6.1.24	The VDES network protocol 10-02	China MSA	WG3
ENAV24-	7.1	Committee Work Programme for 2018-2022	IALA Secretariat	Plenary
ENAV24-	7.2	WP IALA-ENAV-22 Task Plan (ENAV23-11.2)	IALA Secretariat	Plenary
ENAV24-	9.0	Terms of Reference of WG1	ENAV23	WG1
ENAV24-	9.1	WP A lay-persons description of e-Navigation	ENAV23	WG1
ENAV24-	9.2	WP Draft IALA Rec on MS in the context of ENAV	ENAV23	WG1
ENAV24-	9.3	WP Draft Guideline IALA on MS in the context of ENAV	ENAV23	WG1
ENAV24-	10.0	Terms of Reference of WG2	ENAV23	WG2
ENAV24-	11.0	Terms of Reference of WG3	ENAV23	WG3

Meeting	Agenda Item	Input Paper Title	Source	Action
ENAV24-	12.3.1	Recommendation on VTS and AtoN Maritime Services	WG1	To Council
ENAV24-	12.3.2	Liaison Note to ARM on Cyber Security Workshop	WG1	To ARM10
ENAV24-	12.3.3	Liaison Note to IHO on web service-based S-100 data exchange	WG1	To Council then IHO
ENAV24-	12.3.3.1	Draft Guideline on web service based on S-100 data exchange	WG1	To Council then IHO (forward GL to ENAV25)
ENAV24-	12.3.4	Draft Guideline on a template for the review of emerging technologies for possible use by IALA members	WG2	To Council
ENAV24-	12.3.5	Liaison Note to IMO NCSR 3GPP in the maritime domain	WG2	To Council then IMO
ENAV24-	12.3.6	Liaison Note to ARM on AMRD and ITU matters	WG3	To ARM10
ENAV24-	12.3.6.1	Working document towards a preliminary draft revision of Annex 2 of Recommendation ITU-R M.585-7	WG3	To ARM10
ENAV24-	12.3.6.2	ITU Liaison Statement to IALA on the revision of Recommendation ITU-R M.585-7	WG3	To ARM10
ENAV24-	12.3.7	Document on R-Mode to be made as an input to ENG11	WG3	To ENG11
ENAV24-	12.3.8	Liaison Note to PAP on ENAV document structure	WG3	To PAP
ENAV24-	12.3.9	Liaison Note from IALA to ITU on working document towards a preliminary draft revision of Recommendation ITU-R M.1371-5	WG3	To ARM10
ENAV24-	12.3.9.1	Liaison Statement to ITU on working document towards a preliminary draft revision of Recommendation ITU-R M.1371	WG3	To ARM10
ENAV24-	12.2.1	Draft Guideline on platforms for Maritime Services	WG1	To ENAV25
ENAV24-	12.2.2	A lay persons explanation on Maritime services	WG1	To ENAV25
ENAV24-	12.2.3	ENAV Working Group Terms of Reference	Plenary	To ENAV25
ENAV24-	12.2.4	VDES news release after WRC19	WG3	On hold pending WRC19
ENAV24-	12.2.5	Initial Review of 3GPP 4G Technology	WG2	To ENAV25
ENAV24-	12.2.6	Candidate Technology Review for Digital Voice over VHF (dPMR example)	WG2	To ENAV25
ENAV24-	12.2.7	ENAV Task Plan 2018-2022	Vice Chair	To ENAV25
ENAV24-	12.2.8	IALA G1139 VDES Change Log	WG3	To ENAV25

Action Items for the Secretariat

1. The **IALA Secretariat** is requested to forward the document 'a lay person's description of e-Navigation' (ENAV24-12.2.2) as a working paper to ENAV25. 13
2. The **IALA Secretariat** is requested to forward the Draft Guideline 'Web Services based S-100 data exchange' (ENAV24-12.3.3.1) as a working paper to ENAV25. 13
3. The **IALA Secretariat** is requested to forward the Liaison Note to the IHO on the 'IALA Guideline on IP (Web Service) based S-100 data exchange' (ENAV24-12.3.3) and its associated draft Guideline (ENAV24-12.3.3.1) to the Council for approval and, following approval, to the IHO S-100 Working Group and the IHO S-124 Correspondence Group. 13
4. The **IALA Secretariat** is requested to forward the draft Guideline on 'Platforms for Maritime Services' (ENAV24-12.2.1) as a working paper to ENAV25 13
5. The **IALA Secretariat** is requested to forward the draft Guideline Template for review of emerging technologies for possible use by IALA members (ENAV24-12.3.4) to IALA Council for approval. 14
6. The **IALA Secretariat** is requested to consider the process for updating the 'Position on the development of Aids to Navigation Services'. 14
7. The **IALA Secretariat** is requested to forward working paper on Candidate Technology Review for 4G (ENAV24-12.2.5) to ENAV25 for review by Working Group 3. 15
8. The **IALA Secretariat** is requested to forward working paper on Candidate Technology Review for Digital Voice over VHF (dPMR example) (ENAV24-12.2.6) to ENAV25 for review by Working Group 3. 15
9. The **IALA Secretariat** is requested to send the information paper on 3GPP (ENAV24-12.3.5) to IALA Council for e-mail approval and, following approval, to IMO NCSR 7. 17
10. The **IALA Secretariat** is asked to consider the implementation of an FAQ area on the IALA website and identify a suitable method to ensure content is provided by the Committees and maintained, to address the technical and logistical FAQs, as appropriate. 19
11. The **IALA Secretariat** is requested to consider providing access to the protected area of the IALA Wiki for the use of IALA Committees, noting the specific use requirement of Working Group 2 in support of the review of emerging technologies. 19
12. The **IALA Secretariat** is requested to consider placing a note on the IALA website to state that superseded documents may be available upon request. 19
13. The **IALA Secretariat** is asked to consider adding the QPSK point files 'G1139-1_QPSK_points.zip' to the edition 3 of G1139 on the IALA website page as document G1139-1. 20
14. The **IALA Secretariat** is requested to consider actions to ensure that the IALA IPR Wikipedia page is published correctly and linked from the IALA web and IALA Wikipedia pages. 20
15. That the **IALA Secretariat** forwards the Liaison Note on 'working document towards a preliminary draft revision of Recommendation ITU-R M.1371-5' to ARM10. 20
16. The **IALA Secretariat** is requested to forward the Liaison Note on Assignment and use of identities in the maritime mobile service for AMRD Group B (ENAV24-12.3.6) to ARM10. 20
17. The **IALA Secretariat** is requested to forward the Liaison Note on VDES R-Mode and its accompanying draft Guideline on VDES R-Mode (ENAV24-12.3.7 and ENAV24-12.3.7.1) to ENG11. 23
18. The **IALA Secretariat** is requested to forward the Liaison Note on the 'Proposed e-navigation documentation architecture & update' (ENAV24-12.3.8) to PAP for review. 23
19. The **IALA Secretariat** is requested to consider publishing a news release (ENAV24-12.2.4) following the approval by WRC-19 of the VDE-SAT frequencies. 24
20. The **IALA Secretariat** is requested to forward the Task Plan 2018 – 2022 to ENAV25 (ENAV24-12.2.7). 24

21. The **IALA Secretariat** is requested to send the report of ENAV24 (ENAV24-13.1) to the IALA Council to note. 24

Action Items for Participants

22. That **Committee Participants** are encouraged to contribute to the document ‘a lay person’s description of e-Navigation’ (ENAV24-12.2.2) and to provide input to ENAV25. 13
23. That **Committee Participants** are encouraged to contribute to the development of the draft Guideline on ‘Platforms for Maritime Services (ENAV24-12.2.1) and provide input to ENAV25. 13
24. **P Lane (CIRM)** is asked to investigate existing use of vocoder(s) for maritime use and provide a report to ENAV25 with recommendations and justifications on suitable vocoder(s) for consideration in further review of this technology. 15
25. **J F Coutu** is requested to provide a review of LEO constellation developments, using Template for review of Emerging Technologies, and provide this for review at ENAV25. 16
26. **K Heikonen** is requested to provide a review of LoRA / LoRaWAN, using the Template for review of Emerging Technologies, and provide this for review at ENAV25. 16
27. That **Committee Participants** are asked to provide input on the identified, and other, emerging technologies that may be suitable for use by IALA members and provide input and expertise to ENAV25. 16
28. **P Lane (CIRM)** is asked to coordinate with IALA on ways to ensure close cooperation on technical issues of mutual interest, including the participation in CIRM working groups and technical meetings. 17
29. **E Batty** is asked to further develop the mind map, noting input through the intersessional electronic discussion process, and provide as input to ENAV25. 19
30. That **Committee Participants** are invited to provide input to further revision of ‘working document towards a preliminary draft revision of Recommendation ITU-R M.1371-5’ (ENAV24-12.3.9.1) to the Chair of Working Group 3 before the 17 January 2020 for consideration at the intersessional meeting planned for February 2020. 20
31. That **Committee Participants** are asked to provide a change proposal on limiting the number of receivers and transmitters in the context of G1139 to the Chair of Working Group 3 for discussion at the February intersessional meeting before the 17 January 2020. 23
32. That **Committee Participants** are invited to note the development process for G1139 and review the G1139 changelog and submit change proposals for the coming intersessional meeting not later than 17th of January 2020 to the [Working Group 3 intersessional file share](#) or directly to the Chair of Working Group 3. 23
33. That **Committee Participants** are requested to provide VDES patent information to the Chair of Working Group 3 for discussion at the intersessional meeting before 17 January 2020. 23



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