



## **IALA ENAV COMMITTEE**

# **REPORT OF THE 23<sup>RD</sup> SESSION OF THE IALA E-NAVIGATION INFORMATION SERVICES AND COMMUNICATIONS (ENAV) COMMITTEE**

**1 to 5 April 2019**

**Kevin Gregory**  
Committee Secretary

**5 April 2019**

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

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## **Report of the 23<sup>rd</sup> Session of the IALA e-Navigation Information Services and Communications (ENAV) Committee Executive Summary**

The 23<sup>rd</sup> session of the ENAV Committee was held at the InterContinental Hotel, Singapore, between the 1 and 5 April 2019.

123 Participants from 27 countries and 3 sister organisations participated in ENAV23, 30 for the first time. There were 6 observers.

This was the second meeting for the 2018-2022 Work Programme and the Committee considered 60 input papers and produced 22 output papers from three Working Groups.

Key outputs included:

The revision of the following Guideline:

- Guideline G1139 on Technical Specification of VDES.

The following liaison notes were prepared:

- To Council to approve the draft Guideline as given above;
- To Council to approve the following submissions to:
  - 3GPP on the update of 3GPP Release 16 Stage 1 MARCOM standardization;
  - the Electronic Communications Committee – Working Group FM on the Digitisation of Maritime Services – digital VHF (voice);
  - the ITU-WP5 on Autonomous Maritime Radio Devices (AMRD) in conjunction with the ARM Committee;
  - the ITU-WP5B on a preliminary draft revision to ITU Recommendation ITU-R M.1371;
  - to the joint IMO/ITU Experts Group on maritime radio communication matters related to VDES R-Mode and VHF digital voice communication; and
  - the ITU World Radio Conference on the IALA position on WRC Agenda item 1.9.2 VDE SAT;
- To the Policy Advisory Panel on:
  - the 2018-2022 Work Programme as it relates to e-Navigation;
  - a lay persons description of e-Navigation;
  - the IALA position on the development of Marine Aids to Navigation; and
  - the identification and assessment of technologies; and
  - the Terms of Reference of each Working Group.
- To ARM and VTS on Maritime Services in the context of e-Navigation;
- To ARM on Maritime Resource Names;
- To ARM, VTS and ENG Committees on R-Mode;
- To ENG on incorporating the UN Sustainable Development Goals into Recommendation R1004.

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

## Table of Contents

Executive Summary .....	3
1. Introduction .....	6
1.1 Administrative announcements	7
1.2 Welcome from the Maritime and Port Authority of Singapore	7
1.3 Welcome from IALA	8
1.4 Approval of the agenda	8
1.5 Introductions and apologies	8
1.6 Programme for the week	9
2. Review of Action Items from ENAV22 .....	9
2.1 Action Items – IALA Secretariat	9
2.2 Action Items – ENAV Committee Participants	9
3. Review of input papers .....	9
3.1 IALA Recommendation R1004 Environmental Management in the provision of Aids to Navigation	9
3.2 IALA position on the development of Marine Aids to Navigation Services	9
4. Reports from other bodies .....	10
4.1 IALA Council	10
4.2 IALA Policy Advisory Panel	10
4.3 E-Navigation Underway	10
4.4 IMO	10
4.5 EfficienSea2	10
5. Reports from Rapporteurs .....	10
5.1 IMO	10
5.2 RTCM	11
5.3 ITU	11
5.4 IEC	12
5.5 ETSI	12
6. Presentations .....	12
6.1 Development of near miss and dynamic hotspots	12
6.2 Maritime Connectivity Platform Consortium	12
6.3 dPMR testing in the maritime VHF band	12
6.4 VDES testbed in Japan	12
6.5 IALA World-Wide Academy	13
6.6 3GPP and IALA Collaboration	13

7.	Establish Working Groups .....	13
8.	Working Group 1 – Digital Information System (WG1).....	14
8.1	Review of the Terms of Reference .....	14
8.2	Update on SMART Project .....	14
8.3	IP-Port to VDES Messages (MCP VDES Integration) .....	14
8.4	Review IALA Draft Guideline Maritime Service Portfolios: Digitising Maritime Services .....	14
8.5	Position on Maritime Resource Names (MRN) Management and Usage Structure .....	15
8.6	Recommendation and Guideline on Maritime Services in the Context of e-Navigation .....	15
9.	Working Group 2 – Emerging Digital Technology (WG2).....	15
9.1	Liaison with 3GPP .....	15
9.2	Digitisation of the maritime voice services .....	17
9.3	R Mode .....	17
9.4	LTE-Maritime (SMART-Navigation) .....	18
9.5	Review of new technologies template .....	18
9.6	Combined meeting of Working Groups 2 and 3 .....	18
10.	Working Group 3 – Digital Communication System (WG3) .....	19
10.1	Revised G1139 – Technical Specification of VDES .....	19
10.2	Support ARM with regards to the development of Autonomous Marine Radio Devices (AMRD) .....	20
10.3	Monitor the work of ITU .....	20
10.3.1	Preparations towards WRC-19 on Agenda Item 1.9.2 (VDE-SAT) .....	20
10.3.2	ITU-R M.1371 Revisions .....	20
10.4	Development of VDES R-Mode .....	20
11.	Work Programme (2018 – 2022).....	21
12.	Review of output and working papers .....	21
13.	Any Other Business .....	21
13.1	14 <sup>th</sup> IALA Symposium – Rotterdam, the Netherlands – May 2020 .....	21
13.2	Farewell Pieter Paap .....	21
14.	Review of session report .....	22
15.	Date and venue of next meetings .....	22
16.	Closing of the Meeting .....	22
17.	List of Annexes .....	22
ANNEX A	ENAV23 Committee Agenda .....	23
ANNEX D	List of input papers .....	51
ANNEX E	List of Output Documents and Working Papers .....	54
	Action Items.....	56

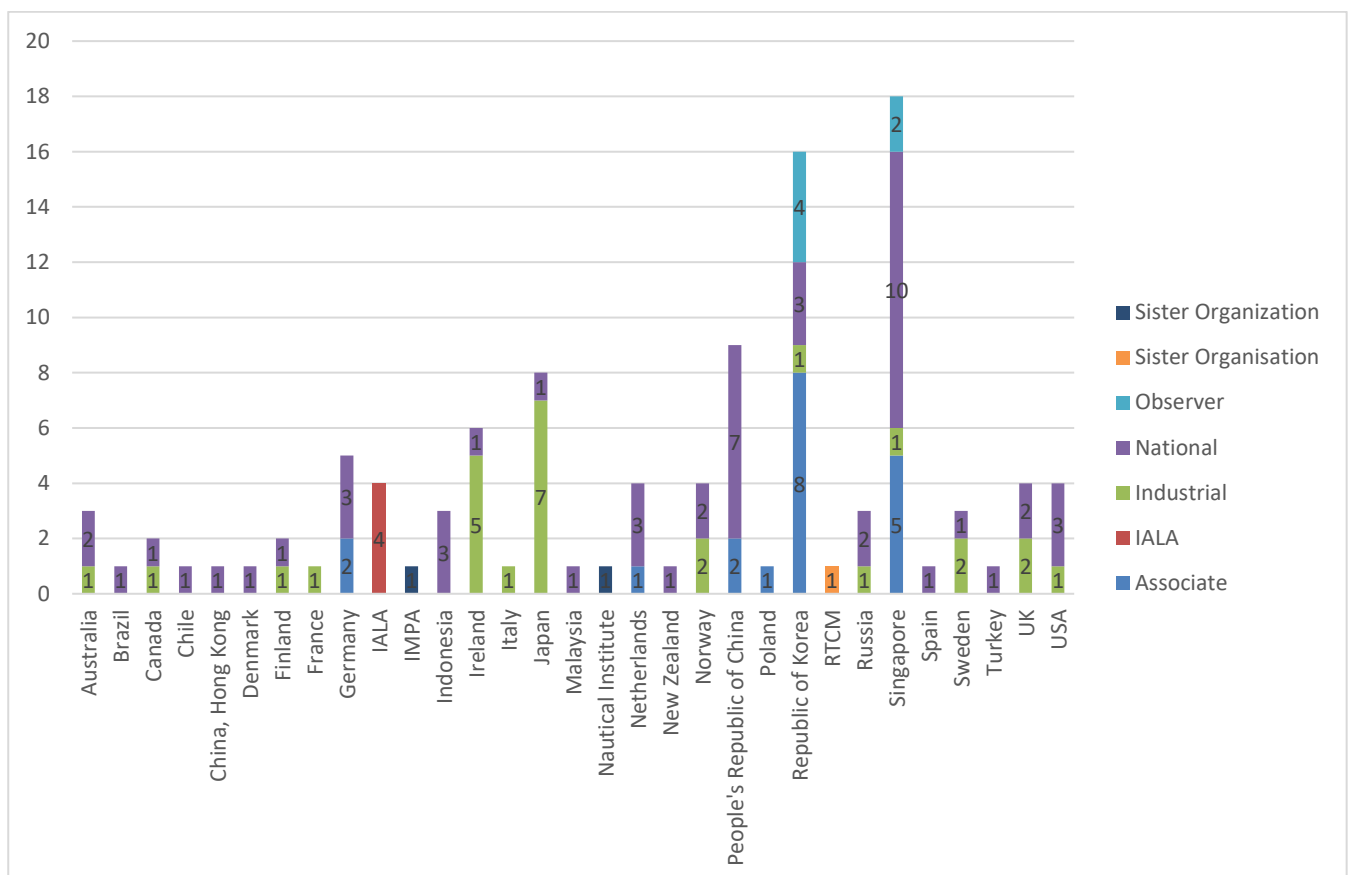
## Report of the 23<sup>rd</sup> Session of the IALA e-Navigation Information Services and Communications (ENAV) Committee

### 1. INTRODUCTION

The 23<sup>rd</sup> meeting of the ENAV Committee was held between the 1 and 5 April 2019 at the InterContinental Hotel, Singapore. Hideki Noguchi was the Chair of the Committee and Jorge Arroyo Vice Chair. The Secretary for the meeting was Kevin Gregory.

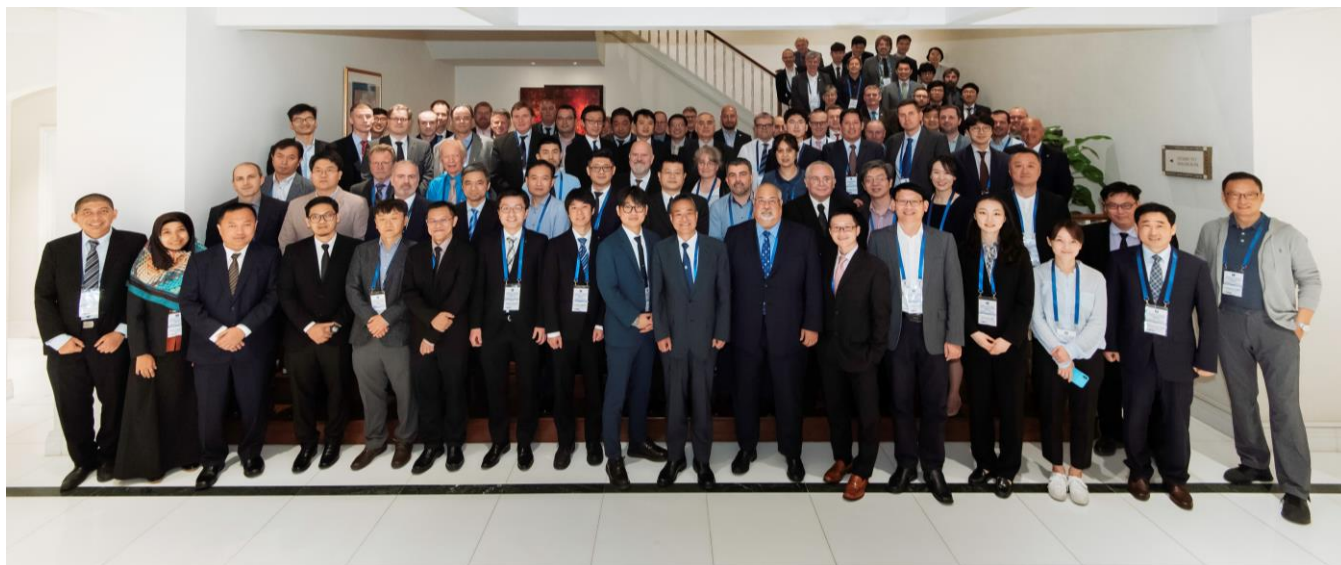
123 Participants from 27 countries and 3 sister organisations participated in ENAV23, 30 for the first time. There were 6 observers.

An analysis of the attendance at ENAV23 is in graph format below:



The Chair welcomed all participants to ENAV23 and to Singapore.

With much regret, the Chair informed participants of the sad passing of Mr Pierre D'Arcy from the Canadian Coast Guard. Pierre was a long serving and dedicated member of the ENAV Committee and was a very active and committed advocate for e-Navigation internationally. The Chair commended the Committee participants to continue the active development of e-Navigation in his memory. A moment of silence was held in tribute to Pierre.



### 1.1 Administrative announcements

Paper ENAV23-1.3.1 (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 although it was subsequently declared that intellectual property rights including patented technical modules applied to elements of presentation ENAV23-6.1 (development of near risk and dynamic hotspots – MPA Singapore and Fujitsu). In particular, the algorithm model that Fujitsu built and subsequently used in the simulations shown.

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 Maritime and Port Authority of Singapore

Captain Muhammad Segar, Assistant Chief Executive (Operations) of the MPA of Singapore welcomed all participants to Singapore. Captain Segar stated that the MPA was pleased to host ENAV23 and was very encouraged by the good turnout especially as the Committee was being held away from IALA Headquarters. A wide range of issues are planned for discussion at ENAV23 including R-Mode using VDES transmission as a promising candidate for a back-up positioning tool. The MPA are looking forward to actively participating in the forthcoming R-Mode workshop as well as keenly pursuing the developments of VDES in both the satellite and terrestrial domains.

The MPA are also looking forward to the ongoing discussions related to the Maritime Services and maritime LTE which has showed promising results to support maritime digital communications. The MPA appreciated the opportunity to present the partnership with Fujitsu on the development of near risk and dynamic hotspot systems, the trials have yielded some interesting results with the potential to impact further e-Navigation and maritime safety developments.

Captain Segar reiterated the full commitment of Singapore to IALA's vision related to the safe, economic and efficient movement of vessels through improvement and harmonisation of aids to navigation world-wide. Singapore is proud to be an active contributor to the IALA Technical Committees and an IALA Council Member. The recently signed Memorandum of Understanding with IALA to support the World-Wide-Academy further supports the commitment of Singapore to the safety of navigation and the commitment to work with international states and partners. Captain Segar concluded by stating that IALA has come a long way since it was established in 1957 and that the MPA fully supports the change of status to an Inter-Governmental Organisation as IALA continues to soar to greater heights. E-Navigation is a crucial part of IALA's work and Captain Segar hoped all participants would have constructive and fruitful discussions as well as finding time to enjoy the sights and sounds of Singapore.

### 1.3 Welcome from IALA

The Deputy Secretary-General welcomed all participants to ENAV23 and thanks Captain Segar and the MPA team for their hard work and dedication in making the arrangements for the Committee and subsequent Initial Operating Capability Phase (IOC) workshop.

There was an impressive list of input papers covering a wide variety of topics which will make for good discussions and the sharing of ideas. There is now a lot of work and focus on the practical implementation phase of e-Navigation which will be further developed by the forthcoming IOC workshop. The work of all Technical Committees is highly appreciated and is vital to the work of the organisation.

The third Preparatory Diplomatic Conference was recently held in Istanbul, Turkey. The draft convention text to enable IALA to transition to an Inter-Governmental Organisation is taking shape and the text is now close to finalisation with just a few issues remaining to be resolved. The process will now move forward to the Diplomatic Conference which should take place in early 2020 in Kuala Lumpur, Malaysia. The Diplomatic Conference will finalise the Convention with world-wide Governments after which time it will be open to ratification. This represents a major milestone in the history of IALA and it is envisaged that the status will change to an Inter-Governmental Organisation once 30 states have ratified or acceded to the Convention. The Deputy Secretary-General encouraged all participants to recommend the adoption of the Convention to their national Governments.

The 14<sup>th</sup> IALA Symposium will be held in May 2020 in Rotterdam, the Netherlands. The theme for the Symposium now covers both e-Navigation and VTS and the interrelationship between these two important domains. The call for papers is now open and participants are urged to submit their ideas before the closing date.

Following a successful e-Navigation Underway International conference in February, plans are progressing for the forthcoming e-Navigation Underway North America and Asia Pacific events. Of note, the Asia Pacific event will be followed by a capacity building workshop to consider how developing countries may adopt e-Navigation solutions as soon as possible.

The first World Marine Aids to Navigation day will be held on the 1<sup>st</sup> July 2019 and all IALA members are urged to celebrate aids to navigation in some way in your own countries and organisations. The main event for 2019 will be held in Palma de Mallorca hosted by Spain.

The Deputy Secretary-General concluded by stating in his dual role as Dean of the IALA World-Wide Academy that IALA was very grateful for the sponsorship provided by the MPA. If it were not for sponsors like the MPA it would not be possible for the IALA World-Wide Academy to fulfil its mission. All participants were wished a fruitful week and reminded that the Secretariat stood ready to assist.

### 1.4 Approval of the agenda

The agenda was reviewed and adopted (ENAV23-1.3.1).

### 1.5 Introductions and apologies

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



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

## 1.6 Programme for the week

The Chair explained the programme for the week (ENAV23-1.5.1) which was adopted.

Participants were invited to an e-Racon and e-Radar demonstration to be hosted by the MPA on Friday 5 April 2019 after the closure of ENAV23.

## 2. REVIEW OF ACTION ITEMS FROM ENAV22

Input paper ENAV23-2.1.1 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 confirmed that all action items allocated to the Committee participants had been completed with the exception of item 6 related to FAQs on e-Navigation.

#### Action item

*The **Committee Chair, Vice Chair and Working Group Chairs** are requested to discuss the need and scope of consolidated FAQs on e-Navigation inter-sessionally by correspondence.*

## 3. REVIEW OF INPUT PAPERS

Input papers are numbered in line with the agenda.

The Committee had no comments on the list input papers as presented by the Secretary. All papers are available on the IALA website and on the file-share system during the meeting.

### 3.1 IALA Recommendation R1004 Environmental Management in the provision of Aids to Navigation

The Committee reviewed the draft revisions to Recommendation R1004 (ENAV23-3.2.11 and ENAV23-3.2.11.1) with particular reference to the inclusion of the UN Sustainable Development Goals. The Committee made several suggestions with respect to Annex A of the Recommendation related to IALAs contribution to the United Nations Sustainable Development Goals.

#### Action item

*The **Committee Secretary** is requested to send the Liaison Note and accompanying Recommendation R1004 on Environmental Management in the provision of Aids to Navigation (ENAV23-12.1.16 and ENAV23-12.1.16.1) to ENG10.*

### 3.2 IALA position on the development of Marine Aids to Navigation Services

The Committee reviewed the IALA position paper on the development of Marine Aids to Navigation Services (ENAV23-4.2.1) and made several suggestions for the consideration of the Policy Advisory Panel.

#### Action item

*The **IALA Secretariat** is requested to send the proposed amendments on the IALA position on the development of Marine Aids to Navigation Services (ENAV23-12.1.17) to the Policy Advisory Panel for consideration.*

## 4. REPORTS FROM OTHER BODIES

### 4.1 IALA Council

The Committee noted the report of the 68<sup>th</sup> meeting of the IALA Council report of the 68<sup>th</sup> Session which was held in December 2018, ENAV23-4.1.1 refers.

The Technical Operations Manager informed Committee participants about the report and reported that all Guidelines, input papers to IMO and ITU and the proposal for the e-Navigation Initial Operating Capability Phase Workshop from ENAV22 were approved. The current Committee structures will be trained and the Secretariat has been requested to reports on its efficiency at future Council meetings.

### 4.2 IALA Policy Advisory Panel

The Technical Operations Manager informed Committee participants of the key outputs from PAP37 of relevance to the ENAV Committee. In particular, participants were briefed on the discussions related to S200, the UN Sustainable Development Goals as well as the work related to the next editions of the NAVGUIDE and IALA Questionnaire. PAP had requested that all Committees review the Position on the Development of Marine Aids to Navigation Services document (paper ENAV23-4.2.1 refers).

### 4.3 E-Navigation Underway

E-Navigation Underway International was held between the 6 and 8 February onboard the MS Pearl Seaways (papers ENAV23-4.3.1.1 and ENAV23-4.3.1.2 refer). A total of 21 presentations were given which are available on the IALA website. Due to the combined IALA VTS and ENAV Symposium, there will be no e-Navigation Underway International event in 2020.

Committee participants were advised of the following forthcoming E-Navigation Underway events:

- E-Navigation Underway Asia Pacific, from the 1 to 3 September 2019 in Seoul, Republic of Korea (followed by an e-Navigation Capacity Building Workshop).
- E-Navigation Underway North America, from the 12 to 13 November in Tampa, United States of America.

### 4.4 IMO

The Technical Operations Manager provided a briefing on the 121<sup>st</sup> IMO Council meeting. The main areas of interest to IALA were the papers and subsequent discussion on strategy, planning and reform of the Organization (paper ENAV23-4.4.1 refers). The remainder of IMO updates were given by the Rapporteur (Hideki Noguchi) under agenda item 5.

### 4.5 EfficienSea2

No updates were provided related to EfficienSea2. Committee participants were advised that a general briefing would be provided as part of presentation on the establishment of the Maritime Connectivity Platform Consortium (ENAV23-6.2).

## 5. REPORTS FROM RAPPORTEURS

### 5.1 IMO

Hideki Noguchi provided participants with an update on the recent IMO Maritime Safety Committee (MSC100), Sub-Committee on Navigation, Communication and Search and Rescue (NCSR6), and Harmonisation Group on Data Modelling (HGDM2). Paper ENAV23-4.4.3 refers.

With respect to MSC100, the regulatory scoping exercise on maritime autonomous surface ships (MASS) commenced. This was generally related to mapping MASS issues with relevant IMO instruments such as SOLAS, COLREG and STCW etc. One specific group is examining issues related to SOLAS Chapter V which includes

Regulation 12 and 13 related to VTS and AtoN. It is anticipated that the regulatory scoping exercise should be completed in 2020 at MSC102. Work may then continue to examine the more technical aspects of MASS including how digital technology may be used.

NCSR6 made progress on e-Navigation matters including progressing a draft MSC Resolution on guidance on the definition and harmonisation of the format and structure of Maritime Services in the context of e-Navigation. Further development of the Maritime Services is required and IALA is taking an active role as the domain coordinating body for MS 1, 2 and 3. It was commented that it was important for IALA to remain aligned with the definitions contained in the IMO guidance.

Work also progressed on the draft MSC Resolution and Circular on guidelines for the standardisation of user interface design for navigation equipment.

The work items related to the modernisation of the GMDSS and the incorporation of Iridium as a GMDSS provider progressed.

NCSR6 considered the IALA submission related to VHF digital voice communications and recognised that the matters were not yet mature enough for inclusion on the WRC23 agenda but requested that IALA keep the Sub-Committee informed of progress made.

## 5.2 RTCM

Jorge Arroyo provided participants with an update on RTCM matters. The annual assembly was held in 2018. Two radar standards for non-SOLAS ships trading domestically were approved. A further standard related to AIS personal location beacons was finalised and approved by the US Federal Communications Commission. A guideline on the drafting of application specific messages was finalised and will be provided to both IMO and IALA for consideration.

## 5.3 ITU

Stefan Bober provided participants with an update on ITU activities with full briefings provided in papers ENAV23-5.3.1 to ENAV23-5.3.5 refer).

ITU Working Party 5B met in November 2018 and IALA had a specific interest in maritime mobile services including the 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. The Working Party finalised its proposals for the allocation of a channel assignment for VDE satellite component which will now be considered by WRC19.

A session of the Conference Preparatory Meeting (CPM) was held in February 2019 for the purpose of preparing the CPM Report to the World Radiocommunication Conference 2019 (WRC-19) and to address preparatory studies for the following Conference.

Discussions were held on NAVDAT which is a digital system named Navigational Data for broadcasting maritime safety and security related information from shore-to-ship in the 500 kHz band. NAVDAT is counted as an enhancement of existing NAVTEX and could be considered as a potential entity in the next generation of GMDSS

Autonomous Maritime Radio Device (AMRD) matters were discussed with a view to preventing the unregulated operation of AMRD in order to ensure the integrity of GMDSS and AIS. The AMRD are grouped and identified as AMRD Group A that enhance the safety of navigation and AMRD Group B that do not enhance the safety of navigation. The assignment of radio channels for AMRD Group B is proposed.

With respect to VDE-SAT, IALA may consider an update to its position on proposed method for WRC-19 agenda item 1.9.2 (VDE SAT) taking into account the results of the CPM meeting. IALA may select one method to be recommended in the communication with its members (see paper ENAV23-5.3.5).

## 5.4 IEC

Stefan Bober provided participants with an update on IEC matters related to man over board and VDES-ASM standards.

IEC TC 80 WG15 prepared a working document towards a Man Over Board Station (MOB) standard.

WG 15 considered the latest development at ITU and IMO NCSR 6 on Autonomous Maritime Radio Device (AMRD) with regard to MOB device which should have DSC Class M capability as described in Rec. ITU-R M.493 (a combination of DSC and AIS for MOB).

It is planned to launch an appropriate new work item proposal for an MOB standard at IEC via the German national committee DKE in spring this year.

IEC TC 80 WG15 is working toward a new work item proposal for a VDES – ASM equipment standard. The general development of VDES will be done in a stepwise approach addressing the different functions of VDES, i.e. ASM, VDE TER, VDE SAT.

WG 15 intends to develop a standard for the combined AIS and ASM functionality as a first step in the VDES standard family. WG 15 aims to develop a IEC Publicly Available Specification (PAS) on a VDES AIS/ASM station for autumn 2019. The intention of the PAS is to raise awareness of this development at IEC to a broader audience and to attract more participants for that work.

## 5.5 ETSI

Pete Hizey in his role as Chair of the ETSI TG Marine (on behalf of the assigned Rapporteur, Derek Love) provided a briefing on ETSI activities. A presentation was provided to the Secretariat for inclusion in the report (paper ENAV23-5.5.1 refers).

# 6. PRESENTATIONS

## 6.1 Development of near miss and dynamic hotspots

Paper ENAV23-6.1 (news article) refers. Post-meeting note: the presentation was subsequently withdrawn at the request of Fujitsu and replaced with a news article.

The presentation was made by Wey Lin Tang and Hiraku Fujimoto related to the role of ICT and human factors in helping recognition and judgment in developing near miss and dynamic hotspot situations.

## 6.2 Maritime Connectivity Platform Consortium

Paper ENAV23-6.2 (presentation) refers.

The presentation was made by Thomas Christensen related to the establishment, structure and role of the Maritime Connectivity Platform Consortium.

## 6.3 dPMR testing in the maritime VHF band

Paper ENAV23-6.5 (presentation) refers.

The presentation was made by Pete Hizey related to digital private mobile radio and its role in the maritime VHF band.

## 6.4 VDES testbed in Japan

Paper ENAV23-6.4 (presentation) refers.

The presentation was made by Hideki Noguchi and Yoshio Miyadera on the evaluation of an operational trial of VDES in Japan in December 2018.

## 6.5 IALA World-Wide Academy

Paper ENAV23-6.5 (presentation) refers.

The presentation was made by Kevin Gregory related to the work of the IALA World-Wide Academy on education and training, capacity building and research and development related to e-Navigation.

## 6.6 3GPP and IALA Collaboration

Paper ENAV3-6.6 (presentation) refers.

The presentation was made by Hyounhee Koo and was related to digitalisation, mobilisation and automation of maritime communication services over 3GPP systems (LTE, 5G).

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

## 7. ESTABLISH WORKING GROUPS

The Chair invited all Working Group Chairs to introduce the work planned for ENAV23. Committee participants were reminded of the change of designation of WG2 and WG3 from ENAV22.

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

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 (acting)
WG3 – Digital Communication System	Stefan Pielmeier Stefan Bober

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

The following activities were addressed during the Working Group 1 at ENAV23.

### 8.1 Review of the Terms of Reference

Input document ENAV23-8.0 document was reviewed by the working group. At ENAV22 several changes were made due to the fact of cross-cutting issues between different ENAV Working Groups, other IALA Technical Committees and other organisations. The Terms of Reference are submitted again for approval by the ENAV23 committee.

After ENAV22, the Work Programme was confirmed by Council. This is in parts contradictory to the ToR as identified by ENAV22. Therefore, the Working Group prepared a Liaison Note to PAP stating that according to the ToR, the Working Group is willing to support the other committees with respect to ensuring the basic principles required to harmonise the work on the implementation of the concepts of e-Navigation.

The Working Group decided not to address the work on S-230 in this working period.

#### Action item

*The **Committee Secretary** is requested to send the Liaison Note (ENAV23-12.1.2) on the 2018-2022 Work Programme as it relates to e-Navigation matters, and the revised terms of reference for Working Group 1 of the ENAV Committee (ENAV23-12.2.3) to the Policy Advisory Panel for consideration.*

*The **Committee Secretary** is requested to forward the revised terms of reference for Working Group 1 of the ENAV Committee (ENAV23-12.2.3) to ENAV24.*

### 8.2 Update on SMART Project

The Working Group noted paper ENAV23-1.11 (Revised report on the development of SMART-Navigation product specification) and thanks the contributors for the information provided.

### 8.3 IP-Port to VDES Messages (MCP VDES Integration)

The Working Group held a combined meeting with Working Group 3 on this issue and noted document ENAV23-1.17) Addition of IP-Port to VDES Messages To support VDES service gateway addressing mode application (G1139)).

### 8.4 Review IALA Draft Guideline Maritime Service Portfolios: Digitising Maritime Services

The Working Group considered documents ENAV23-8.1, ENAV23.3.8, ENAV23.3.8.1. and ENAV23.3.8.2.

These documents have been reviewed by the Working Group. Minor remarks are captured in a liaison note to ARM and VTS. The Working Group identified a need to “understand” the relationship of Maritime Services as a Concept of e-Navigation (MS), Technical Services (TS), and Data Models (DM) and to describe the split of work between IALA Committees, IHO, IMO etc. While latter is addressed in the updated ToR the Working Group developed a working document for explaining the concepts in an easy understandable way.

#### Action item

*The **Committee Secretary** is requested to send the Liaison Note (ENAV23-12.1.3) on Maritime Services in the Context of e-Navigation (MS) to the ARM and VTS Committees together with the working document ‘a lay-persons description of e-Navigation (ENAV23-12.1.4).*

*The **IALA Secretariat** is requested to send the working document ‘a lay-persons description of e-Navigation (ENAV23-12.1.4) to the Policy Advisory Panel for consideration.*

*The **Committee Secretary** is requested to forward the working document ‘a lay-persons description of e-Navigation (ENAV23-12.1.4) to ENAV24.*

***Committee Participants** are requested to provide comments on the working document ‘a lay-persons description of e-Navigation (ENAV23-12.1.4) as input to ENAV24.*

## 8.5 Position on Maritime Resource Names (MRN) Management and Usage Structure

Following the discussion at WG4 of the S-100 Committee the Working Group discussed its requirements and formulated its considerations into a Liaison note to ARM. According to the ToR, the Working Group offered ARM a cooperation in the generation on a Guideline on MRN usage and alignment with IHO and other parties.

### Action item

*The **Committee Secretary** is requested to send the Liaison Note (ENAV23-12.1.5) on Maritime Resource Names (MRN) and its annex (ENAV23-12.1.5.1) IHO Level Guidance on how to manage the IHO Maritime Resource Names (MRN) namespace to the ARM Committee for review and to establish a liaison process on the subject.*

## 8.6 Recommendation and Guideline on Maritime Services in the Context of e-Navigation

The Maritime Services and the Maritime Connectivity Platform have been handled by the ENAV Committee for some time and, in addition, influenced the preparation IALA Guideline 1128 on the Specification of Technical Services. As the Maritime Services gain in maturity IALA members may benefit from a Recommendation with respect to platforms for the implementation of Maritime Services in the Context of e-Navigation (MS) and an accompanying Guideline.

The Working Group commenced the preparation of a IALA Draft Recommendation on Maritime Services in the context of e-Navigation and a IALA Draft Guideline IALA on Maritime Services in the context of e-Navigation.

### Action item

*The **Committee Secretary** is requested to forward the draft Recommendation on the 'provision of Maritime Services in the context of e-Navigation' (ENAV23-12.2.1) and the draft Guideline on 'communication frameworks for the provision of Maritime Services in the context of e-Navigation' (ENAV23-12.2.2) to ENAV24 for further development.*

***Committee Participants** are requested to review the draft Recommendation on the 'provision of Maritime Services in the context of e-Navigation' (ENAV23-12.2.1) and the draft Guideline on 'communication frameworks for the provision of Maritime Services in the context of e-Navigation' (ENAV23-12.2.2) and provide their comments as input to ENAV24.*

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

The Chair of the Working Group thanks all participants for their hard work during the week and to the Vice Chair, Ernie Batty, who stepped in to role at short notice. The Chair also thanked the MPA and the venue staff for their assistance in the organisation of the Working Group room and technical resources.

### 9.1 Liaison with 3GPP

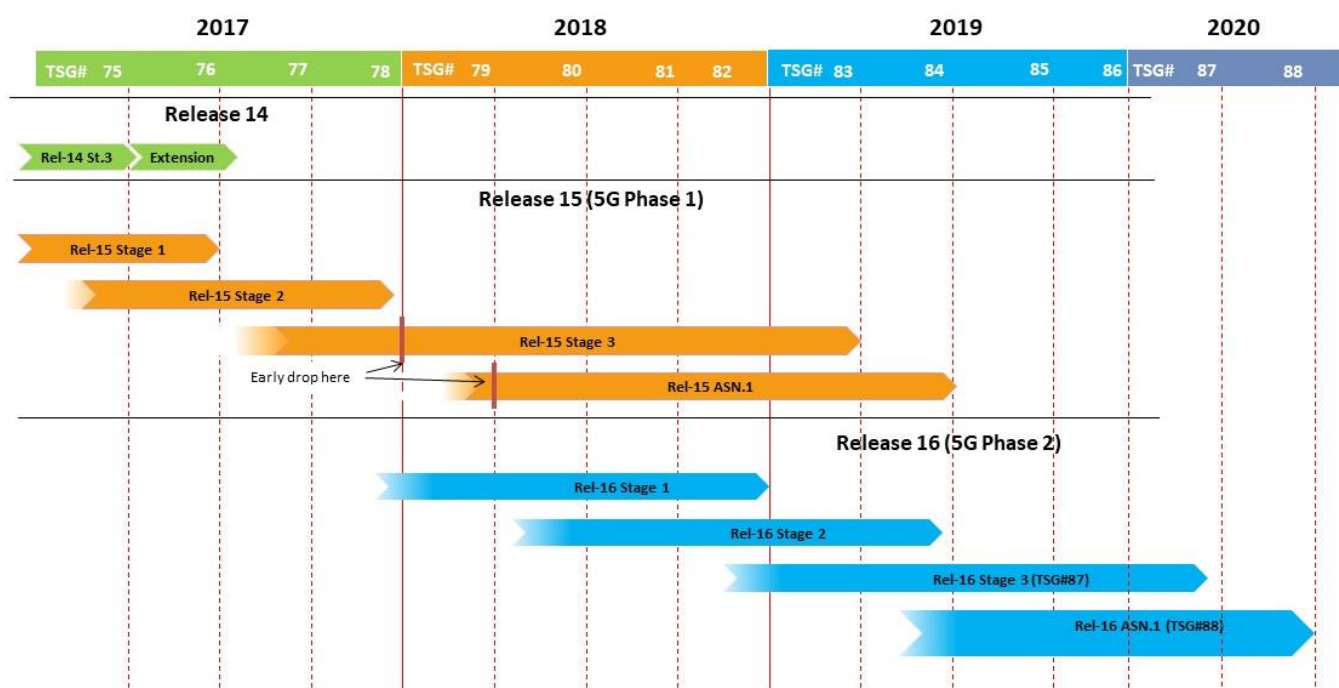
Ms. H Koo noted that the 3GPP group had a range of terminology that was used in the 3GPP documentation and that this was different to that used in IALA.

There are three primary groups in 3GPP as follows:

1. RAN - Radio Access Network group which is responsible for the radio performance, physical layer and conformance testing for User Equipment (UE) and Base Stations.
2. SA - Service and System Aspects is responsible for the overall architecture and service capabilities of systems based on 3GPP specifications.
3. CT - Core Network and Terminals is responsible for specifying terminal interfaces (logical and physical), terminal capabilities (such as execution environments) and the Core network part of 3GPP systems.



The planned release dates are as below



This timing was provided off the 3GPP web site.

The documentation for the Maritime Vertical will be completed using the 3GPP three stage model with the three stages being:

1. Stage 1 is an overall service description from the user's standpoint.
2. Stage 2 is an overall description of the organization of the network functions to map service requirements into network capabilities.
3. Stage 3 is the definition of switching and signalling capabilities needed to support services defined in stage 1.

The IALA interaction with 3GPP is at the Stage 1 level, providing advice and guidance on maritime related matters.

Stage 2 and 3 will either use existing 3GPP capability or will describe new capability such as used by the Union Internationale des Chemins de fer (UIC) for GSM on Railways.

Given that IALA represents only one sector of the maritime domain, it was recommended by the eNav committee that 3GPP schedule and present the 3GPP Maritime Vertical to the International Maritime Organisation (IMO) and the International Telecommunications Union (ITU) working party 5B.

The Technical Requirements document that was used to construct the Stage 1 and associated documents as submitted to IALA eNav23 can be found on the IALA file share.

Working Group 2 reviewed the documents provided, noting specific comments in track changes on the document Technical Specification Group Services and System Aspects; Maritime Communication Services over 3GPP system; Stage 1 (ENAV23-12.1.6 and ENAV23-12.1.6.1).

#### Action item

*The IALA Secretariat is requested to send the Liaison Note and its associated annex to 3GPP SA WG1 (Cc: 3GPP TSG SA) on reply to the Liaison Statement on the update of 3GPP Release 16 Stage 1 MARCOM standardization (ENAV23-12.1.6 and ENAV23-12.1.6.1) to the IALA Council for the advance approval process and, subject to approval, send to 3GPP before its next meeting which is held on the 6 June 2019.*



## 9.2 Digitisation of the maritime voice services

There are several technologies available that include 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.

The initial comments by the Working Group on this topic are:

1. That any evaluated technologies have a clear migration path both from the current analogue systems to the new digital systems by allowing both the digital and analogue systems to co-exist in the same transceiver for the duration of the entire migration period. This could extend to using the same antenna and other existing physical installation hardware.
2. The channel efficiency be a high priority by allowing up to four (4) digital voice channels for each 25Khz maritime VHF voice channel.
3. The digital service includes the capability of transmitting the location of the radio for the entire duration of the digital voice conversation.
4. The digital service allows a Short Message Service (SMS) without the need to set up a digital or other voice call.
5. The digital voice quality be similar to or better than the analogue voice service especially using weaker radio signals at the extents of the radio coverage.
6. The price of the combined analogue and digital radio should be similar or less than the existing analogue only radios to ensure global adoption
7. There should be few or no Intellectual Property Right (IPR) associated with the digital technology
8. The digital technology should be mature and not requiring any significant further development to satisfy maritime user requirements associated with the digitisation of the maritime voice services

Working Group 2 has drafted two liaison papers with one going to the ECC in response to their paper submitted to IALA and a second submission to the IMO/ITU Experts Group.

It was noted that J van Gils (NL) could be the IALA rapporteur on the CEPT project group FM 58 dealing with the digitisation of the VHF radio channels in preparation of a position and proposal for ITU. The project group FM58 will have its next meeting on the 24th and 25th April 2019 in Bonn, Germany. The next meeting of the CEPT is scheduled for July 2019.

Working Group 2 reviewed the JRC time scale slide and felt that this could be addressed in a more timely manner and thus reduce the migration time scale by 4 years (one WRC cycle).

### Action item

*The IALA Secretariat is requested to send the Liaison Note to the Electronic Communications Committee (ECC) – Working Group FM on the Digitisation of Maritime Services – digital VHF (voice) (ENAV23-12.1.8) to the IALA Council for the advance approval process and, subject to approval, send to the ECC before its next meeting on the 24 and 25 April 2019.*

*The IALA Secretariat is requested to send the input paper on VDES R-Mode and VHF digital voice communication (ENAV23-12.1.12) to the IALA Council for the advance approval process and, subject to approval, send to the IMO/ITU EG by the 7 June 2019.*

## 9.3 R Mode

Working Group 2 reviewed the input provided (ENAV23-3.2.1) with regards to the operational aspects of R-Mode. The comments were forwarded to Working Group 3 for their consideration as appropriate.

#### 9.4 LTE-Maritime (SMART-Navigation)

The input regarding LTE-Maritime was reviewed. This included a presentation on the results of the test-bed using LTE-Maritime as an element of the SMART-Navigation Project (Republic of Korea). A detailed review of LTE-Maritime as a candidate technology, which was provided in the draft template for the initial assessment of new candidate technologies, was completed.

Working Group 2 thanked the Republic of Korea for their submission, and for using the draft template process. The review of the technology resulted in the identification of further questions regarding the proposed use of LTE-Maritime, and also provided an opportunity to review and revise the draft candidate assessment template.

It was noted that other members are trialling the use of LTE for maritime use. A presentation on the use of LTE to support safe and efficient navigation in China was presented.

#### 9.5 Review of new technologies template

The staged process to conduct an initial assessment of new candidate technologies, as developed at ENAV22, was reviewed. The template was revised to reflect comments on the template and based on the experience of the use of the template by the Republic of Korea.

The template was considered to be a useful means to assess candidate technologies, and that this should be brought to the attention of the other IALA Committees. Working Group 2 drafted a liaison to the Policy Advisory Panel to bring their attention to the terms of reference of Working Group, and the development of the 'Candidate Technologies – Initial Review'.

##### *Action item*

*The IALA Secretariat is requested to send the Liaison Note on the identification and assessment of technologies (ENAV23-12.1.7) and its annex on digital technologies – initial review process (ENAV23-12.1.7.1) to the Policy Advisory Panel for consideration.*

*Committee Participants are requested to review the revised document on digital technologies – initial review process (ENAV23-12.1.7.1) and to provide comments on the process as well as using the template to provide information on developing technologies.*

#### 9.6 Combined meeting of Working Groups 2 and 3

A combined meeting of Working Group 2 and 3 was held on 2 April 2019.

The objectives of the session were to:

- Identify expectations and requirements for digital communications to support IALA membership (operational, technical; short-term to longer-term);
- List technologies, existing and developing, related to the digital transformation of the maritime environment and identify if these may be suitable for use by IALA members;
- Outline elements to be considered in a digital transition strategy for the maritime environment, with a focus on IALA members;
- Review the work programme for IALA (2018-2020), the tasks identified for ENAV, and the Terms of Reference for Working Group 2 and 3 and identify options to address these through a coordinated approach for the Working Groups.

The outcomes of the combined session were reviewed by Working Group 2 and will be considered in the further work of Working Group 2 and Working Group 3 and with other Committees as appropriate.

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

Working Group 2 and 3 held a common workshop to address following emerging technologies:

- LTE-Maritime
- 3GPP
- dPMR

By example of these technologies, the work responsibilities of Working Group 2 and Working Group 3 were assessed by all participants in syndicate table discussions. This led to the revision of the Terms of Reference for Working Group 3. Further work on these emerging technologies is continued by Working Group 2. The task plan was updated to reflect the agreed changes.

### 10.1 Revised G1139 – Technical Specification of VDES

Following official input papers were reviewed and action to create change proposals asked to the members:

- ENAV23-3.1.17 “Addition of IP Port to VDES messages to support VDES service gateway addressing mode application” in conjunction with Working Group 1,
- ENAV23-3.1.13 CP on G1139 ASM-SAT,
- ENAV23-3.1.15 VDE Signal Ambiguity Issue,
- ENAV23-3.1.12 VDE ARQ Efficiency,
- JRC input on Multi Carrier.

For official input ENAV23-3.1.17, the presentation was followed by an intensive workshop involving Working Group 1 and Working Group 3 participants, fruitfully drafting the basic architecture of the involved nodes to get services from the server to the maritime equipment on board of the ship. The work is continued by a correspondence group including a Working Group 1 member to describe the potential technical integration of VDES into the MCP.

The following official input papers were decided to be reviewed in the following intersessional:

- ENAV23-3.1.16 VDE Channelization,
- ENAV23-3.1.9 VDE-SAT UL TX Timing Advance.

The change log was used to track all updates from Sydney change proposals and updated. A revised G1139 (edition 3) was reviewed and agreed. As per the agreed process, work will now commence on G1139 (edition 4), which is planned for publication after ENAV24. Following the conclusions of WRC-19, G1139 (edition 5) is planned to be released after ENAV25. G1139 (edition 5) will be used, as appropriate, to provide input to ITU WP 5B as proposed revision to ITU-R M.2092-0, working towards ITU-R M.2092-1.

Working Group 3 envisions two inter-sessional meetings, we request members to plan participation:

- August 19 and 23 August 2019 at St. Germain-en-Laye (IALA Headquarters). This inter-sessional meeting was authorised by the Committee to submit output to the ITU WRC19 for direct Council approval in view of the fact that ENAV24 will commence on the closing date for ITU-WRC19 paper submissions.
- January or February 2020 at St. Germain-en-Laye (IALA Headquarters)

#### Action Items

*The IALA Secretariat is requested to send the revised Guideline G1139 on the technical specification of VDES (ENAV23-12.1.11) to the Council for approval and uploading to the IALA website as soon as possible to avoid potential patent issues as long as G1139 is not published.*

*Committee Participants are asked to note the development process for Guideline G1139 on the technical specification of VDES and provide input on edition 4 to the intersessional meetings and ENAV24.*

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

Input paper ENAV23-3.2.1 was reviewed and a liaison note to ITU WP 5B was drafted to support the ARM Committees work on AMRD. The draft liaison was provided to ARM committee and questions were clarified.

No further action is expected and required on this item.

## 10.3 Monitor the work of ITU

### 10.3.1 Preparations towards WRC-19 on Agenda Item 1.9.2 (VDE-SAT)

The Committee reviewed input ENAV23-5.3.5 and ENAV23-3.1. on “Proposed changes to IALA position on WRC-19” and the accompanying Liaison Note. According to these inputs, the IALA position on VDE-SAT and liaison note were further developed and approved.

#### Action Item

*The **IALA Secretariat** is requested to send the IALA position paper on the ITU World Radio Conference agenda item 1.9.2 (VDE-SAT) (ENAV23-12.1.9.1) to the IALA Council and, subject to approval, send to the ITU before 7 October 2019.*

***Committee Participants** are requested to promote the IALA position paper on the ITU World Radio Conference agenda item 1.9.2 (VDE-SAT) (ENAV23-12.1.9.1) to their ITU representatives.*

*That the **Committee Chair** liaises with IMO ITU expert group highlighting the aspect of VDES R-Mode and VHF Digital voice communication aiming for inclusion of these items into the agenda item “modernization of GMDSS” Resolution 361 (WRC-15).*

### 10.3.2 ITU-R M.1371 Revisions

The Liaison Statement to IALA (ENAV23-5.3.4) was reviewed and a response was drafted.

#### Action Item

*The **IALA Secretariat** is requested to send the Liaison Note on the draft revision of Recommendation ITU-R M.1371-5” (ENAV23-12.1.10) to the IALA Council for the advance approval process and, subject to approval, send to the ITU-R WP 5B not later than Monday, 22<sup>nd</sup> of April 2019 at 19:55 UTC.*

## 10.4 Development of VDES R-Mode

The input papers ENAV23-3.1.3, ENAV23-3.2.2, ENAV23-3.2.10, ENAV23-3.1 were reviewed.

The R-Mode subgroup discussed functional stakeholder requirements (ENAV23-3.1.14). As result a liaison note to ENG, ARM and VTS committees was developed including a stakeholder requirement template with the request for feedback as appropriate.

#### Action Item

*The **Committee Secretary** is requested to send the Liaison Notes on R-Mode and the associated R-Mode Stakeholder Requirements documents (ENAV23-12.1.13, ENAV23-12.1.14 and ENAV23-12.1.15) to the ARM, VTS and ENG Committees as appropriate.*

***Committee Participants** are requested to review the Liaison Note on R-Mode to the ARM and VTS Committees and the associated Stakeholder Requirements document (ENAV23-12.1.13 and ENAV23-12.1.15) and provide input to ENAV24 as appropriate.*

Working Group 3 discussed different ranging methods and agreed on a work plan towards inclusion into VDES. Identified changes for VDES will be submitted for discussion at the intersessional meeting in August.

There will be an IALA R-Mode workshop scheduled from 9 to 12 September 2019 at IALA Headquarters to further develop VDES R-Mode.

Working Group 3 reviewed the draft liaison statement to IMO ITU expert group on VDES R-Mode and VHF digital voice communication. Working Group 3 revised the text on VDES R-Mode to reflect latest developments.

## 11. WORK PROGRAMME (2018 – 2022)

From the Council approved work programme (ENAV23-11.1) 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 **Committee Secretary** is requested to forward the Task Plan 2018 – 2022 to ENAV24 (ENAV23-11.2).

## 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 Secretary was requested to forward the output documents, as indicated earlier in the report.

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. ANY OTHER BUSINESS

### 13.1 14<sup>th</sup> IALA Symposium – Rotterdam, the Netherlands – May 2020

Pieter Paap provided Committee participants with a video and presentation on the forthcoming IALA VTS and ENAV Symposium to be held between the 25 and 29 May 2020 in Rotterdam, the Netherlands. Committee participants were reminded that the call for papers is now open and that innovative and high quality papers would be welcomed.

### 13.2 Farewell Pieter Paap

ENAV23 is the last Pieter Paap will attend before retirement. The Chair thanked Pieter for his hard work, dedication and knowledge which has resulted in a significant contribution to the development of e-Navigation around the world. The Chair presented Pieter with a small gift on behalf of the Committee and looked forward to seeing him again at the IALA Symposium in Rotterdam which all participants were looking forward to greatly.

### 13.3 IMO World Maritime Day 2019



The theme for the International Maritime Organization World Maritime Day 2019 is empowering women in the maritime community.

Jillian Carson-Jackson, the Chair of Working Group 2 of the Committee is actively promoting the 2019 World Maritime Day. As part of this, she briefed the Committee on the range of events that were being held around the world.

The photograph shows the female participants to ENAV23.

## 14. REVIEW OF SESSION REPORT

The report of the meeting (ENAV23-14.1) was reviewed and approved by the Committee.

### *Action Item:*

*The IALA Secretariat is requested to send the report of ENAV23 (ENAV23-14.1) to the IALA Council to note.*

## 15. DATE AND VENUE OF NEXT MEETINGS

ENAV24 will be held between the 7 and 11 October 2019 at IALA Headquarters, Saint Germain-en-Laye, France.

E-Navigation Underway Asia Pacific will be held between the 1 and 3 September 2019 in Seoul, Republic of Korea.

The IALA R-Mode Workshop will be held between the 9 and 12 September 2019 at IALA Headquarters, Saint Germain-en-Laye, France.

E-Navigation Underway North America will be held between the 12 and 13 November 2019 in Tampa, Florida, United States of America.

The combined IALA VTS and ENAV Symposium will be held between the 25 and 29 May 2020 in Rotterdam, the Netherlands.

For other IALA related events see the calendar section of the IALA web site.

## 16. CLOSING OF THE MEETING

The Chair thanked again all Committee participants for all their hard work and accomplishments during the meeting. The Chair, on behalf of IALA and all Committee participants thanked the Maritime and Port Authority of Singapore for their hard work in planning and executing a smooth meeting and for the generous hospitality provided.

The Chair hoped to see all participants at ENAV24 in October and looked forward to the e-Navigation Initial Operating Capability Phase Workshop next week.

## 17. 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.



## 23<sup>rd</sup> Session of the e-Navigation Information Services and Communications Committee (ENAV23)

The 23<sup>rd</sup> session of the **ENAV Committee** will be held from 1 – 5 April 2019, at the Inter-Continental Hotel, Singapore.

The opening plenary will commence at 1300 on Monday 1 April 2019, and the closing plenary will end at approximately 1300 on Friday 5 April.

Committee Chair, Vice-Chair and Working Group Chairpersons are requested to meet at 0900 on Monday 1 April.

### Agenda

1. Introduction
  - 1.1. Welcome from the Maritime and Port Authority of Singapore
  - 1.2. Welcome from the Deputy Secretary-General
  - 1.3. Administration and Safety Briefing Secretary/MPA
  - 1.4. Approval of agenda
  - 1.5. Apologies and introductions
  - 1.6. Programme for the week
2. Review of action items from last meeting
  - 2.1. Review of action items from ENAV22
  - 2.2. Final Report from ENAV22 - for reference
3. Review of input papers
  - 3.1. ENAV Committee related input
  - 3.2. Input from other Committees
4. Reports from other bodies:
  - 4.1. IALA Council 68 Minsu Jeon
  - 4.2. Policy Advisory Panel (PAP) Minsu Jeon
  - 4.3. E-Navigation Underway Minsu Jeon
    - 4.3.1. International
    - 4.3.2. North America
    - 4.3.3. Asia Pacific
  - 4.4. IMO Minsu Jeon
    - 4.4.1. IMO Council 121
    - 4.4.2. IMO MSC 100



- 4.4.3. IMO NCSR 6
- 4.4.4. IMO/IHO HGDM 2
- 4.5. IHO
- 4.6. EfficienSea2
- 4.7. ITU
- 5. Reports from rapporteurs
  - 5.1 IMO Hideki Noguchi
  - 5.2 RTCM Jorge Arroyo
  - 5.3 ITU Stefan Bober
  - 5.4 ETSI Derek Love
- 6. Presentations
  - 6.1. Development of near risk and dynamic hotspots MPA Singapore
  - 6.2. Maritime Connectivity Platform Consortium Thomas Christensen
  - 6.3. dPMR testing maritime VHF band Pete Hizzey
  - 6.4. VDES testbed in Japan Hideki Noguchi
- Yoshio Miyadera
  - 6.5. IALA World-Wide Academy Kevin Gregory
  - 6.6. 3GPP and IALA collaboration Hyounhee Koo
- 7. Establish Working Groups
- 8. WG1 – Digital Information System
- 9. WG2 – Emerging Digital Technology
- 10. WG3 – Digital Communication System
- 11. Work Programme (2018 - 2022)
- 12. Review of output and working papers
  - 12.1. Output papers
  - 12.2. Working papers
- 13. Any Other Business
  - 13.1. Presentation on the VTS-ENAV Symposium, Netherlands
- Rotterdam – May 2020
- 14. Review of session report
- 15. Date and venue of next meeting
- 16. Close of the meeting



**ANNEX B**
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Hai Li	China MSA	China/National
Dian Nurdiana	Directorate General of Sea Transportation	Indonesia/National
Nurma Jayanti Skom	Directorate General of Sea Transportation	Indonesia/National
Jia Chyuan Chong	Maritime and Port Authority of Singapore	Singapore/National

### Observers

Name	Organisation	Country
Mr Hiraku Fujimoto	Fujitsu Laboratories Ltd	Singapore
Mr Isamu Watanabe	Fujitsu Laboratories Ltd	Singapore
Mr Jaehyeon Kim	Ace Antenna	Korea
Mr Jaewoong Han	Cosmeta	Korea
Mr Sunae Hwang	Korea Maritime Safety Association	Korea
Mr Hyounhee Koo	3GPP	Korea

## ANNEX C WORKING GROUP PARTICIPANTS

### Working Group 1 Digital Information System

	Members	Organisation / Country
1.	Dr Axel Hahn (Chair)	OFFIS e.v. / Germany
2.	Jin Park (Vice Chair)	KRISO / Republic of Korea
3.	Mr Paul Williams	GLA / United Kingdom
4.	Mr Stéphane Lessard	Canadian Coast Guard
5.	Captain Simon Pelletier	IMPA / Canada
6.	Mr Guoxu Lin	Marine Department / Hong Kong
7.	Mr Hiraku Fujimoto	Fujitsu / Singapore (Observer)
8.	Mr Isamu Watanabe	Fujitsu / Singapore (Observer)
9.	Mr Yongqiang Zhu	China Maritime Safety Administration
10.	Mr Todd Schuett	Kongsberg Norcontrol AS / Norway
11.	Mr Mahesh Alimchandani	Australian Maritime Safety Authority
12.	Mr Omar Frits Eriksson	IALA
13.	Mr Sunae Hwang	Korea Maritime Safety Association
14.	Prof Eun-Kyu Jang	Korean Institute of Maritime and Fisheries Technology
15.	Mr Gum-Jun SON	Korean Register of Shipping
16.	Mr Wey Lin Tang	Maritime and Port Authority of Singapore
17.	Mr René Hogendoorn	SAAB AB Transpondertech / Sweden
18.	Mr Soyeong LEE	Ministry of Oceans and Fisheries / Korea
19.	Mr David Foo	Maritime and Port Authority of Singapore
20.	Cdr Hideki Noguchi	Japan Coast Guard
21.	Mr Kwanghyun Lim	KRISO / Korea
22.	Mr Fredrik Karlsson	Swedish Maritime Administration
23.	Mr Minsu Jeon	IALA
24.	Mr Jochen Ritterbusch	Federal Maritime and Hydrographic Agency / Germany
25.	Ms Elly Lee	GMT / Korea



## Working Group 2      Emerging Digital Technology

	Members	Organisation / Country
1.	Jillian Carson-Jackson (Chair)	The Nautical Institute / Australia
2.	Ernest Batty (EmVice Chair)	IMIS Global / United Kingdom
3.	Mr Simon Brooks	Australian Maritime Systems
4.	Mr Jie Wen	China Waterborne Transport Research Institute
5.	Mr Liang Zhang	China Maritime Safety Administration (CMSA)
6.	Mr Ronan Boyle	Commissioners of Irish Lights
7.	Mr Dmitry Rostopshin	Wärtsilä / Ireland
8.	Ms. Kaisu HEIKONEN	Finnish Transport Infrastructure Agency
9.	Mr Marat Ismagilov	Kronshtads Technologies, JSC / Russia
10.	Mr Pieter Paap	Ministry of Infrastructure and Watermanagement
11.	Mr Geir Jegstad	IALA
12.	Nurma Jayanti Skom	Directorate General of Sea Transportation
13.	Mr Nanditya Darma Wardhana	Directorate General of Sea Transportation

### Working Group 3

### Digital Communication System

	Members	Organisation / Country
1.	Stefan Pielmeier (Chair)	CIRM / Denmark
2.	Stefan Bober (Vice Chair)	WSV / Germany
3.	Mr Ronald RAULEFS	German Aerospace Centre (DLR)
4.	Mr Ross W NORSWORTHY	US Coast Guard
5.	Mr Patrick GALLAGHER	US Coast Guard
6.	Mr Johnny SCHULTZ	US Coast Guard
7.	Mr Bal RANDHAWA	ExactEarth Ltd / Canada
8.	Dr Jan SAFAR	GLA Research and Development (GRAD) / United Kingdom
9.	Mr Xianming QING	A*STAR- I2R / Singapore
10.	Ms Xin SUN	Beijing JiaoTong University / China (CMSA)
11.	Mr Hai LI	Beijing Institute of Technology / China (CMSA)
12.	Dr Krzysztof BRONK	National Institute of Telecommunications / Poland
13.	Mr Juntae KIM	Korean Register of Shipping
14.	Mr Jaewoong HAN	Cosmeta / Korea
15.	Mr Jaehyeon KIM	Ace Antenna / Korea
16.	Mr Mohd Izuan ISNAN	Marine Department Malaysia
17.	Mr Hermann SATTLER	Centro de Sinalização Náutica "Almirante Moraes Rego" / Brazil
18.	Mr Francesco BORGHESE	ELMAN S.r.l. / Italy
19.	Mr Jim FOYE	Maritime New Zealand
20.	Mr Derek LOVE	CML Microcircuits / United Kingdom
21.	Mr Antti KUKKONEN	Furuno Finland Oy
22.	Mr Lars LOGE	Norwegian Coastal Administration
23.	Mr Johan LINDBORG	SAAB AB Transpondertech / Sweden
24.	Mr Hans Christian HAUGLI	Norwegian Coastal Administration
25.	Mr Cato Giil ELIASSEN	Kongsberg Seatex AS / Norway
26.	Prof Michael WANG	Dongnan University / China
27.	Mr Stuart SHEPARD	Australian Maritime Safety Authority
28.	Mr Jeffrey VAN GILS	Ministry of Infrastructure and Watermanagement / Netherlands

## 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
ENAV23-	1.3.1	Provisional Agenda ENAV23	IALA Secretariat	Plenary
ENAV23-	1.5.1	Programme for the week	IALA Secretariat	Plenary
ENAV23-	2.1.1	ENAV22 Action Items	IALA Secretariat	Plenary
ENAV23-	2.2.1	Report of ENAV22	IALA Secretariat	Plenary
ENAV23-	3.1.1	3GPP Technical Specification 22.119 dedicated to maritime communications	3GPP	WG2
ENAV23-	3.1.1.1	3GPP TS 22.119 V2.0.0 (2018-12)	3GPP	WG2
ENAV23-	3.1.1.2	TS 22.119 on “Maritime Communication Services over 3GPP system; Stage 1”	3GPP	WG2
ENAV23-	3.1.1.3	3GPP 22819_CR0002r1_(Rel-16)_S1-183636 revision of S1-183616 Addition of annex in TR 22.819	3GPP	WG2
ENAV23-	3.1.2	Feasibility of digitization of voice radiotelephony in the VHF maritime mobile band and the implementation of digital voice radio telephony in the VHF maritime mobile	ECC CEPT	WG2
ENAV23-	3.1.3	R-Mode – working arrangement for VDES implementation	Michael Hoppe, Alan Grant, Stefan Gewies	WG3
ENAV23-	3.1.4	Report – ENAV WG3 February 2019 Intersessional Meeting	ENAV WG3 Intersessional Group	WG3
ENAV23-	3.1.5	Liaison Statement on the update of 3GPP Release 16 Stage 1 MARCOM standardization	3GPP	WG2
ENAV23-	3.1.6	Proposed changes to IALA position on WRC-19 for CPM19-2-1	Hans Christian Haugli, Space Norway	WG3
ENAV23-	3.1.7	The establishment of the Maritime Connectivity Platform Consortium	Maritime Connectivity Platform Consortium	Plenary
ENAV23-	3.1.8	VDE-SAT TDD 03-11-2019	Michael Wang & TT Xia	WG3
ENAV23-	3.1.9	VDE-SAT Uplink Transmission Timing Advance	Michael Wang & JJ Zhang	WG3

ENAV23-	3.1.10	Detection of near-miss risk and dynamic hotspot in near future	MPA Singapore	Plenary
ENAV23-	3.1.11	REVISED Report on the development of SMART-Navigation product spec	Gumjun Son et al	WG1
ENAV23-	3.1.12	Efficiency of VDE ARQ	Michael Wang & Lei Wang	WG3
ENAV23-	3.1.13	Exact Earth Recommendations related to IALA Guideline 1139	ExactEarth	WG3
ENAV23-	3.1.14	VDES R-mode Stakeholder Requirements	GRAD	WG2
ENAV23-	3.1.15	Potential “Ambiguity” Issues with VDE Signals	Michael Wang & Lei Wang	WG3
ENAV23-	3.1.16	Unified channelisation for VDE transmission structure	Michael Wang & TT Xia	WG3
ENAV23-	3.1.17	Addition of IP-Port to VDES Messages To support VDES service gateway addressing mode application (G1139)	China Maritime Safety Administration	WG3
ENAV23-	3.2.1	Liaison Note to ARM & ENAV re VDES R-Mode system requirements (ENG8-12.1.25)	ENG8	WG3
ENAV23-	3.2.2	Proposal for R-Mode workshop 2019 (ENG8-12.1.23)	ENG8	WG3
ENAV23-	3.2.3	Liaison Note ARM to IALA Committees re MAtoN lights (ARM8-12.1.3)	ARM8	Plenary
ENAV23-	3.2.4	Liaison Note on VDES R-Mode to ENG (ARM8-12.1.6)	ARM8	WG3
ENAV23-	3.2.5	Liaison note to ARM to ENAV on Development of AMRD – Draft IALA Recommendation and Guideline (ARM8-12.1.12)	ARM8	WG3
ENAV23-	3.2.6	Draft Report on IALA questionnaire 2017	IALA Secretariat	Plenary
ENAV23-	3.2.7	Report IALA Questionnaire 2017	IALA Secretariat	Plenary
ENAV23-	3.2.8	Liaison Note to ENAV and ARM on draft Maritime Services Guideline	VTS46	WG1
ENAV23-	3.2.8.1	WP WG1 Draft Guideline on Maritime Services (VTS46-13.3.1)	VTS46	WG1
ENAV23-	3.2.8.2	Appendix 1 MS 1-3_merged revised WG 1 VTS46 (VTS46-13.3.1.1)	VTS46	WG1
ENAV23-	3.2.9	Draft Liaison Note to ENAV Committee on developing technologies	VTS46	WG2
ENAV23-	3.2.10	Liaison Note on VDES R-Mode to ENAV23 (ENG9-12.5)	ENG9	WG3
ENAV23-	3.2.10.1	Draft input to IMO/ITU EG (ENG9-12.5.1)	ENG9	WG3
ENAV23-	3.2.11	Liason Note on R1004 Sustainability	ENG9	Plenary

ENAV23-	3.2.11.1	Draft Recommendation R1004 Ed1 Sustainability Recommendation (ENG9-12.11)	ENG9	Plenary
ENAV23-	4.2.1	Position on the development of AtoN services_Revised PAP36_track changes	IALA Secretariat	Plenary
ENAV23-	4.3.1.1	Conference Highlights ENUW 2019	IALA Secretariat	Plenary
ENAV23-	4.1.1	Report Council 68 Final (C68-19.1)	IALA Secretariat	Plenary
ENAV23-	4.4.1	Summary report of IMO Council 121	IALA Secretariat	Plenary
ENAV23-	4.4.3	Report on IMO NCSR6	IALA Secretariat	Plenary
ENAV23-	5.3.1	IALA Report of ITU-R WP5B meetings November 2018 V20181203	Stefan Bober	Plenary
ENAV23-	5.3.2	Diagram of AMRD in the regulatory framework	Stefan Bober	Plenary
ENAV23-	5.3.3	E Liaison statement to IALA on AMRD	Stefan Bober	Plenary
ENAV23-	5.3.4	E Liaison statement to IALA on revision Rec ITU-R M1371-5	Stefan Bober	Plenary
ENAV23-	5.3.5	IALA_Report_of_ITU_WRC-19_CPM_meeting_Geneva_2019	Stefan Bober	Plenary
ENAV23-	8.0	WP Terms of Reference of WG1 (ENAV22-11.2)	ENAV22	WG1
ENAV23-	8.1	WP Draft IALA Guideline on MSPs v21 (ENAV22-12.2.3)	ENAV22	WG1
ENAV23-	9.0	WP Terms of Reference for WG2 (ENAV22-11.4)	ENAV22	WG2
ENAV23-	9.1	WP Initial Stage proposal IALA template (ENAV22-12.2.1)	ENAV22	WG2
ENAV23-	9.2	WP Initial Stage proposal IALA Candidate Technology - Qualcomm 5G (ENAV22-12.2.2)	ENAV22	WG2
ENAV23-	9.3	Initial assessment of LTE-Maritime	KRISO	WG2
ENAV23-	9.4	LTE-Maritime as an e-Navigation communication infrastructure	KRISO	WG2
ENAV23-	10.0	WP Terms of Reference for WG3 (ENAV22-11.3)	ENAV22	WG3
ENAV23-	10.1	WP WD ITUR M-1371 ENAV22-9.5.2 R15-WP5B-C-0470 P1 MSW-E (ENAV22-12.2.4)docx	ENAV22	WG3
ENAV23-	11.1	Council 68 approved work plan	IALA Secretariat	Plenary
ENAV23-	11.2	WP IALA-ENAV-22 Task Plan (ENAV22-11.1)	ENAV22	Plenary

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

Meeting	Agenda Item	Output Paper Title	Source
ENAV23-	12.1.1	ARM/ENAV joint Liaison note to ITU WP5B - Autonomous Maritime Radio Devices	WG3
ENAV23-	12.1.2	Liaison note to PAP - workplan 2018-2022	WG1
ENAV23-	12.1.3	Liaison to ARM and VTS - Maritime Services in the Context of e-Navigation	WG1
ENAV23-	12.1.4	A lay-persons description of e-Navigation	WG1
ENAV23-	12.1.5	Liaison note to ARM - MRN	WG1
ENAV23-	12.1.5.1	IHO Level Guidance on how to manage the IHO Maritime Resource Names (MRN) namespace	WG1
ENAV23-	12.1.6	Liaison Note to 3GPP	WG2
ENAV23-	12.1.6.1	Liaison Note to 3GPP - Annex comments on 3GPP TS 22.119 V16.0.0 (2018-12)	WG2
ENAV23-	12.1.7	Liaison Note to PAP - identification and assessment of technologies	WG2
ENAV23-	12.1.7.1	Digital Technologies - initial review process	WG2
ENAV23-	12.1.8	Liaison Note to ECC - digitisation of maritime services - digital VHF (voice)	WG2
ENAV23-	12.1.9	Liaison Note to ITU WRC-19 on AI 192 VDE-SAT (Approved WG3) (1)	WG3
ENAV23-	12.1.9.1	Position on WRC-19 AI192	WG3
ENAV23-	12.1.10	Liaison to ITU WP 5B on revision of Rec ITU-R M.1371-5 (1)	WG3
ENAV23-	12.1.11	Revised Guideline G1139	WG3
ENAV23-	12.1.12	Input to the joint IMO/ITU Experts Group on VDES R-Mode and VHF digital voice communication	WG3
ENAV23-	12.1.13	Liaison Note to ARM and VTS on R-Mode	WG3
ENAV23-	12.1.14	Liaison Note to ENG on R-Mode	WG3
ENAV23-	12.1.15	R-Mode Stakeholder Requirements	WG3
ENAV23-	12.1.16	Liaison Note to ENG on R1004 Sustainability	Plenary
ENAV23-	12.1.16.1	Draft Recommendation R1004 Ed1 Sustainability Recommendation	Plenary
ENAV23-	12.1.17	ENAV Comments on IALA Position Paper on AtoN provision	Plenary

**Working papers** will remain within the Committee for further review during **ENAV24**.

Meeting	Agenda Item	Output Paper Title	Source
ENAV23-	12.2.1	Draft Recommendation on the provision of Maritime Services in the context of e-Navigation	WG1
ENAV23-	12.2.2	Draft Guideline on communication frameworks for the provision of Maritime Services in the context of e-Navigation	WG1
ENAV23-	12.2.3	Terms of Reference WG1	WG2
ENAV23-	12.2.4	Terms of Reference WG2	WG2
ENAV23-	12.2.5	Terms of Reference WG3	WG3

## ACTION ITEMS

### *Action Items for the Secretariat*

1. The **Committee Secretary** is requested to send the Liaison Note and accompanying Recommendation R1004 on Environmental Management in the provision of Aids to Navigation (ENAV23-12.1.16 and ENAV23-12.1.16.1) to ENG10. 9
2. The **IALA Secretariat** is requested to send the proposed amendments on the IALA position on the development of Marine Aids to Navigation Services (ENAV23-12.1.17) to the Policy Advisory Panel for consideration. 9
3. The **Committee Secretary** is requested to send the Liaison Note (ENAV23-12.1.2) on the 2018-2022 Work Programme as it relates to e-Navigation matters, and the revised terms of reference for Working Group 1 of the ENAV Committee (ENAV23-12.2.3) to the Policy Advisory Panel for consideration. 14
4. The **Committee Secretary** is requested to forward the revised terms of reference for Working Group 1 of the ENAV Committee (ENAV23-12.2.3) to ENAV24. 14
5. The **Committee Secretary** is requested to send the Liaison Note (ENAV23-12.1.3) on Maritime Services in the Context of e-Navigation (MS) to the ARM and VTS Committees together with the working document 'a lay-persons description of e-Navigation (ENAV23-12.1.4). 14
6. The **IALA Secretariat** is requested to send the working document 'a lay-persons description of e-Navigation (ENAV23-12.1.4) to the Policy Advisory Panel for consideration. 14
7. The **Committee Secretary** is requested to forward the working document 'a lay-persons description of e-Navigation (ENAV23-12.1.4) to ENAV24. 14
8. The **Committee Secretary** is requested to send the Liaison Note (ENAV23-12.1.5) on Maritime Resource Names (MRN) and its annex (ENAV23-12.1.5.1) IHO Level Guidance on how to manage the IHO Maritime Resource Names (MRN) namespace to the ARM Committee for review and to establish a liaison process on the subject. 15
9. The **Committee Secretary** is requested to forward the draft Recommendation on the 'provision of Maritime Services in the context of e-Navigation' (ENAV23-12.2.1) and the draft Guideline on 'communication frameworks for the provision of Maritime Services in the context of e-Navigation' (ENAV23-12.2.2) to ENAV24 for further development. 15
10. The **IALA Secretariat** is requested to send the Liaison Note and its associated annex to 3GPP SA WG1 (Cc: 3GPP TSG SA) on reply to the Liaison Statement on the update of 3GPP Release 16 Stage 1 MARCOM standardization (ENAV23-12.1.6 and ENAV23-12.1.6.1) to the IALA Council for the advance approval process and, subject to approval, send to 3GPP before its next meeting which is held on the 6 June 2019. 16
11. The **IALA Secretariat** is requested to send the Liaison Note to the Electronic Communications Committee (ECC) – Working Group FM on the Digitisation of Maritime Services – digital VHF (voice) (ENAV23-12.1.8) to the IALA Council for the advance approval process and, subject to approval, send to the ECC before its next meeting on the 24 and 25 April 2019. 17
12. The **IALA Secretariat** is requested to send the input paper on VDES R-Mode and VHF digital voice communication (ENAV23-12.1.12) to the IALA Council for the advance approval process and, subject to approval, send to the IMO/ITU EG by the 7 June 2019. 17
13. The **IALA Secretariat** is requested to send the Liaison Note on the identification and assessment of technologies (ENAV23-12.1.7) and its annex on digital technologies – initial review process (ENAV23-12.1.7.1) to the Policy Advisory Panel for consideration. 18
14. The **IALA Secretariat** is requested to send the revised Guideline G1139 on the technical specification of VDES (ENAV23-12.1.11) to the Council for approval and uploading to the IALA website as soon as possible to avoid potential patent issues as long as G1139 is not published. 19



15. The **IALA Secretariat** is requested to send the IALA position paper on the ITU World Radio Conference agenda item 1.9.2 (VDE-SAT) (ENAV23-12.1.9.1) to the IALA Council and, subject to approval, send to the ITU before 7 October 2019. 20
16. The **IALA Secretariat** is requested to send the Liaison Note on the draft revision of Recommendation ITU-R M.1371-5" (ENAV23-12.1.10) to the IALA Council for the advance approval process and, subject to approval, send to the ITU-R WP 5B not later than Monday, 22<sup>nd</sup> of April 2019 at 19:55 UTC. 20
17. The **Committee Secretary** is requested to send the Liaison Notes on R-Mode and the associated R-Mode Stakeholder Requirements documents (ENAV23-12.1.13, ENAV23-12.1.14 and ENAV23-12.1.15) to the ARM, VTS and ENG Committees as appropriate. 20
18. The **Committee Secretary** is requested to forward the Task Plan 2018 – 2022 to ENAV24 (ENAV23-11.2). 21
19. The **IALA Secretariat** is requested to send the report of ENAV23 (ENAV23-14.1) to the IALA Council to note. 22

#### *Action Items for Participants*

20. The **Committee Chair, Vice Chair and Working Group Chairs** are requested to discuss the need and scope of consolidated FAQs on e-Navigation inter-sessionally by correspondence. 9
21. **Committee Participants** are requested to provide comments on the working document 'a lay-persons description of e-Navigation (ENAV23-12.1.4) as input to ENAV24. 14
22. **Committee Participants** are requested to review the draft Recommendation on the 'provision of Maritime Services in the context of e-Navigation' (ENAV23-12.2.1) and the draft Guideline on 'communication frameworks for the provision of Maritime Services in the context of e-Navigation' (ENAV23-12.2.2) and provide their comments as input to ENAV24. 15
23. **Committee Participants** are requested to review the revised document on digital technologies – initial review process (ENAV23-12.1.7.1) and to provide comments on the process as well as using the template to provide information on developing technologies. 18
24. **Committee Participants** are asked to note the development process for Guideline G1139 on the technical specification of VDES and provide input on edition 4 to the intersessional meetings and ENAV24. 19
25. **Committee Participants** are requested to promote the IALA position paper on the ITU World Radio Conference agenda item 1.9.2 (VDE-SAT) (ENAV23-12.1.9.1) to their ITU representatives. 20
26. That the **Committee Chair** liaises with IMO ITU expert group highlighting the aspect of VDES R-Mode and VHF Digital voice communication aiming for inclusion of these items into the agenda item "modernization of GMDSS" Resolution 361 (WRC-15). 20
27. **Committee Participants** are requested to review the Liaison Note on R-Mode to the ARM and VTS Committees and the associated Stakeholder Requirements document (ENAV23-12.1.13 and ENAV23-12.1.15) and provide input to ENAV24 as appropriate. 20



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Association Internationale de Signalisation Maritime