

**IALA COUNCIL
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Agenda item 12 – INTERNATIONAL

12.1 IMO

12.1.2 IMO-IALA Relationship on e-Navigation Matters

Note by the Secretariat

1 SUMMARY

This paper describes recent IMO developments concerning e-navigation and the significance for IALA's work.

2 BACKGROUND, IALA

IALA commenced its work on e-navigation in September 2006.

3 BACKGROUND, IMO

IMO MSC 94 approved the e-navigation Strategy Implementation Plan (SIP), as set out in document NCSR 1/28, Annex 7. The MSC also considered document MSC 94/18/8, proposing the plan of work for IMO for the harmonized implementation and future development of e-navigation, together with document MSC 94/18/10 (Norway), and, recognizing the importance of e-navigation and that IMO should take a leading role, invited IMO Member Governments to:

- .1 review each of the tasks listed in the SIP with a view to reducing the numbers of outputs;
- .2 prepare a full justification for each reviewed output in accordance with the information required in Annex 3 to resolution A.1062(28);
- .3 prepare a comprehensive prioritized plan of work, which should include the time required for the completion of each output; and
- .4 submit the information to MSC 95 for consideration with a view for inclusion in the post-biennial agenda of the Committee.

4 IMO MSC95

As a result of the developments at IMO MSC94, MSC95 will consider a paper submitted by Australia, Denmark, Finland, Germany, the Netherlands, Norway, the Republic of Korea, BIMCO, CLIA, IALA, ICS, InterManager, and the Nautical Institute. The paper title is "Implementing e-navigation to enhance the safety of navigation and protection of the marine environment". A copy may be found in the input documents to this session of Council.

This paper proposes six outputs for inclusion in the High-level Action Plan for the following two IMO biennia (2016-17 and 2018-19). It also proposes to amend the IMO High-level

Action 5.2.6 in order to ensure that the IMO maintains leadership and coordination of e-navigation. The paper requests the MSC to:

- .1 agree to amend the existing the High-level Action 5.2.6 to read "Development and implementation of e-navigation" for inclusion in the High-level Action Plans for 2016-2019; and
- .2 approve, for inclusion in the biennial or post biennial agenda of the NCSR Sub-Committee, as appropriate, the following planned outputs:
 - .1 Guidelines on standardized modes of operation (S-mode);
 - .2 Amendments to the Revised performance standards for Integrated Navigation Systems (INS) (resolution MSC.252(83)) relating to harmonization of bridge design and display of information;
 - .3 Revision of the Guidelines and criteria for ship reporting systems (resolution MSC.43(64), as amended) relating to standardised and harmonized electronic ship reporting and automated collection of onboard data for reporting;
 - .4 Amendments to the General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids (resolution A.694(17)) relating to Built In Integrity Testing (BIIT) for navigation equipment);
 - .5 Guidelines on Harmonized display of navigation information received via communications equipment; and
 - .6 Consideration of reports on development and implementation of Maritime Service Portfolios (MSPs) (and other e-navigation reports) by Member States and other international organizations.

5 SIGNIFICANCE OF THE PROPOSED IMO OUTPUTS FOR THE WORK OF IALA

The first five of the proposed six outputs have limited connection with the work of IALA, being related to ship systems or to ship-shore matters of less concern to IALA. Output 6 is where IALA will be expected, by member states and observer organisations at IMO, to make its contribution, and this will be in the definition and harmonisation of MSPs.

It is important to note that the proposed IMO work does not include communications for e-navigation, or PNT, or a Common Maritime Data Structure.

If the MSC does agree to the requested actions in the input paper then IMO's role in e-navigation will be restricted to the four Guidelines and one Performance Standard. In this case also, IALA should include an item in its work programme to provide regular reports on MSP development to IMO MSC. This would be a task primarily for ENAV but ARM would maintain a record in accordance with its technical domain.

If the request is not agreed, then IMO's direct role in e-navigation will be greatly diminished. In either case, it is clear that IALA must play a major role in the future development of e-navigation.

6 COMPLEXITY IN THE DEVELOPMENT OF E-NAVIGATION GUIDANCE

A difficulty in the comprehension of the development of e-navigation is that a number of states, organisations, and project groups are involved. Some of these are contributing directly to e-navigation, and others on the periphery.

Table 1 will assist the appreciation of this complexity, and includes columns at the right to indicate where each line-item sits in relation to four categories. These are chosen by the Secretariat simply for this table and are:-

- Ship systems
- Shore & space infrastructure
- Communications
- Data Modelling

Note that Table 1 is for illustrative purposes, and does not include all e-navigation activity, studies, projects, test beds, etc..

7 IALA'S LEADING ROLE IN E-NAVIGATION

The work of the ENAV Committee enhanced by the EfficienSea 2 project should enable good progress in the development of IALA's harmonising guidance for e-navigation over the next two to three years. Table 2 indicates the areas in which the ENAV Committee will focus its attention, with the items in bold likely to be of high priority.

8 ACTION

The Council is invited to Note.

9 TABLE 1, MAP OF EXAMPLES OF E-NAVIGATION ACTIVITY

1. International Maritime Organisation						
IMO Organ	Output or Guidance	Comment	Ship systems	Infrastructure, shore & space	Communications	Data Modelling
The e-Navigation related IMO SIP tasks to be proposed for agreement at MSC95 in 2015-06 by Norway, IALA, and others for inclusion in the IMO work plan						
MSC/NCSR	Draft Guidelines on standardized modes of operation, S-mode	Relates primarily to bridge systems and training				
MSC/NCSR	Revised performance standards for Integrated Navigation Systems (INS)	Relates primarily to bridge systems and training				
MSC/NCSR	Standardised and harmonized electronic ship reporting and automated collection of on-board data for reporting	Relates to ship systems with an implication for shore systems				
MSC/NCSR	Built In Integrity Testing (BIIT) for navigation equipment	Relates primarily to bridge systems and training				
MSC/NCSR	Draft Guidelines for the harmonized display of navigation information received via communications equipment	Relates to bridge systems and training, and to information received from shore				
MSC/NCSR	Consideration of reports on development and implementation of Maritime Service Portfolios (MSPs) (and other e-navigation reports) by Member States and other international organizations	Input mechanism for advice by IALA to IMO on IALA's work in e-Navigation				
Related matters under consideration at NCSR2 to be continued at NCSR3 and/or MSC95						
NCSR	Shipboard PVT receivers	Work primarily done in the IALA ENAV Committee (PNT WG). Expected to require a terrestrial backup to satellite, when available. IALA involvement now complete.				
NCSR	Shipboard PNT system	New work initiated by Germany at NCSR2 and relates to on-board processing of PNT data. Not within IALA strategy work.				
NCSR	Detailed review of the GMDSS	Mention of VDES				
NCSR	Guidelines on Maritime Safety Information provisions	Important for IALA's work on MSPs				
NCSR	Matters related to ITU World Radio Conference, and to ITU-R	Important for IALA's work on VDES				
NCSR	Developments in communications					
NCSR	Recognition of Galileo as a component of the IMO WWRNS					
NCSR	Coordination of the work on the review and modernization of the GMDSS with the implementation of the e-navigation Strategy Implementation Plan					
NCSR	Recognition of Iridium					
2. IALA						
IALA Organ	Output or Guidance work currently under way (Initiated 2006-09, revised 2014)	Comment	Ship systems	Shore & space infrastructure	Communications	Data Modelling
ENAV (Harmonisation WG)	<ul style="list-style-type: none"> Data modelling Recommendations including CMDs S200 domain content and domain management Recommendations VDES standardised messages Maritime Cloud Recommendations 	Harmonisation of data models and creation of a set of basic standardised VDES and AIS messages				
ENAV (Implementation WG)	<ul style="list-style-type: none"> Test bed guidance Test bed results and requirements 	IALA Guideline now incorporated into IMO guidance at MSC94 and NCSR2				
ENAV (Telecommunication WG)	<ul style="list-style-type: none"> IALA MRCP VDES Recommendations, satellite and terrestrial Virtual AtoN Recommendations MF digital information communications (NAVDAT) Recommendations MF digital communications (via IALA MF DGPS beacons) Recommendations Mesh networks Recommendations Arctic digital communications Recommendations 	Harmonised communications at VHF and MF will give toll-free information exchange in coastal regions and VTS areas, where it is most needed. VDES is a present focus, to secure frequencies at WRC2015 for terrestrial and satellite use.				
ENAV (Services WG)	<ul style="list-style-type: none"> MSP content and implementation Recommendations E-navigation services Recommendations 	IMO expecting input from IALA at MSC95, at least via group-supported presentation on day 1.				
ENAV (PNT WG)	<ul style="list-style-type: none"> IALA WWRNP Requirements for PNT in e-navigation Recommendations including terrestrial back-up systems eLoran shore systems Recommendations Positioning using IALA DGPS beacons Recommendations 	Resilient PNT is noted by IALA as vital for e-navigation				

World VTS Guide	<ul style="list-style-type: none"> Global VTS information for mariners 	Separate website				
e-navigation.net portal	<ul style="list-style-type: none"> Publicity for e-navigation test beds and conferences 	Separate website				
PAP	<ul style="list-style-type: none"> Introduction of Standards and rolling re-organisation of Recommendations and Guidelines 	To meet the Strategic Vision for IALA				
3. Examples of other Organisations having an important role						
Organisation	Output, Guidance, or Activity	Comment	Ship systems	Shore & space infrastructure	Communications	Data Modelling
ITU-R	World Radio Conference 2015	Allocation of radio channels Vital for VDES, AIS				
	ITU-R M.1371 AIS technical standard	Vital for AIS definition. Has been kept up to date by IALA until 2014.				
IEC	Test standards for AIS devices, including AIS AtoN, and AIS base stations					
	Portrayal - standard symbology	IEC 62288 ed 2, Presentation of navigation related information				
	Ship equipment – environmental test standards					
FERNS	Terrestrial radio-navigation systems	Coordination of Loran-Chayka-eLoran PNT shore systems IALA acts as Secretary to FERNS				
IHO	S99, S100, S101 standards for ENC					
	S200	Allocated to IALA for AtoN, VTS, etc				
Efficiensea2 Project	Accelerated development and testing of Maritime Cloud	Denmark and others including IALA				
Mona Lisa Project	Sea Traffic Management, Route exchange	Sweden and others				
Denmark	Arctic Web	Arctic navigation information portal				
Norway	Arctic services					
Japan	Facilitating development of VDES	Annual VDES workshop in Tokyo				
4. Examples of other Organisations having a related role						
Organisation	Output, Guidance, or Activity	Comment	Ship systems	Shore & space infrastructure	Communications	Data Modelling
European Commission	Single window reporting					
IHMA	AVANTI Harbour information system	Harbour services data				
Arctic Council	Environmental protection	PAME has engaged with IALA over two years				

10 TABLE 2, ENAV COMMITTEE FOCUS AREAS

<i>ENAV Committee Working Group</i>	<i>Output or Guidance</i>
ENAV Harmonisation WG	<ul style="list-style-type: none"> • Data modelling including CMDS • S200 domain content and domain management • VDES standardised messages • Maritime Cloud
ENAV Implementation WG	<ul style="list-style-type: none"> • Test bed guidance • Test bed results and requirements
ENAV Telecommunication WG	<ul style="list-style-type: none"> • IALA MRCP • VDES, satellite and terrestrial • Virtual AtoN Recommendations • MF digital information communications (NAVDAT) • MF digital communications (via IALA MF DGPS beacons) • Mesh networks • Arctic digital communications
ENAV Services WG	<ul style="list-style-type: none"> • MSP content and implementation • E-navigation services
ENAV PNT WG	<ul style="list-style-type: none"> • IALA WWRNP • Requirements for PNT in e-navigation including terrestrial back-up systems • eLoran shore systems • Positioning using IALA DGPS beacons