IALA ENG COMMITTEE

REPORT OF THE 14TH SESSION OF THE IALA ATON ENGINEERING AND SUSTAINABILITY (ENG) COMMITTEE

4 October to 2 November 2021

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4 November 2021

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International Association of Marine Aids to Navigation and Lighthouse Authorities
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Report of the 14th Virtual Session of the IALA AtoN Engineering and Sustainability (ENG) Committee 4 October to 2 November 2021

Executive Summary

The 14th meeting of the ENG Committee (ENG14) was held virtually from 4 October to 2 November 2021.

The session was attended by 114 registered participants from 30 countries. 13 participants attended for the first time.

Working in four working groups, the Committee considered 66 inputs and produced 8 output documents.

The Committee provided comments to the following Standard and document:

- ENG14-12.3.3 Draft revision S1030 Radionavigation Services (for review 2nd half 2021) WG3
- ENG14-12.3.1 NAVGUIDE 2018 WG3 amendments (ENG14)

The Committee finalised the following Guidelines:

- ENG14-12.2.1 GXXXX Sustainable Structural Design of Marine Aids to Navigation

The following liaison notes were prepared:

- ENG14 12.0.1 Liaison note to MASS Task force, all Committees on Work & guidance within the Engineering & Sustainability Committee relevant to MASS
- ENG13-12.0.2 Liaison note to PAP on Proposals for enhancing Environmental Sustainability
- ENG14-12.3.2 Liaison Note to ETSI TGMARINE on Radar standard
- ENG14-12.1.1 Input to Council on Guideline G1065 Geographical Range Equation Correction
- ENG14-12.1.2 Liaison Note to Council that IALA Recommendation E-200-0 be withdrawn

The Committee reviewed the following model courses:

- ENG14-12.2.2 IALA Model Course C2001-8 L2 Module 1.13 Maintenance of Steel Buoys Ed.2 June 2016 post review
- ENG14-12.2.3 IALA Model Course C2001-9 L2 Module 1.14 Power Sources on Buoys Ed.2 June 2016 post review
- ENG14-12.2.4 IALA Model Course C2007-1 L2 Module 7.1&2 Racons Ed.2 June 2016 rev3 post review

The following document was completed and will be soon available in the IALA website:

- Product specifications for S-246 and S-247 (eLoran and dLoran Station Almanac)

The Committee proposed to start the formal procedures to arrange a virtual Heritage Seminar in August 2022 hosted by Directorate of Hydrography and Navigation, Brazil.

The Committee advised participants that the nominations remain open for IALA Heritage Lighthouse of the year 2022 with the deadline for the submission of nomination forms to be the 28th February 2022. All nominations previously submitted would also be re-considered.

Planned intersessional work:

- Develop E-112 Leading Lights and 1023 Leading Lines into a Guideline
- Develop new Recommendation on Marine Light Terms of Measurement
- Continue the Solar Panel Guideline

- Develop guidance quantifying characteristics to meet nautical and operational requirements and ways to verify them
- Continue work on Radar Reflector
- Continue the review on telemetry Guideline 1008
- Progress on the Heritage seminar in August 2022 hosted by Directorate of Hydrography and Navigation, Brazil

The following table shows a summary of the ENG Committee task plan for the work period 2018-2023 and the progress made to date.

Overall status of the ENG Committee 2018-2023 Work Programme after ENG14:

Task		WG	Start Session	Planned End Session	Revised End Session	Progress Indicator			Status Overview
						Green	Yellow	Red	
Standard 1010 – AtoN planning and service requirements									
1.1.1	Revised guidance on Simulation Technology to revise G1097 in cooperation with ARM task 1.2.4	2	8	14					This task is continued by ARM
1.2.1	Develop Guidance on checking that 3rd party AtoN providers are providing what they are obliged to provide– 3rd party AtoN provider quality control. (Joint ARM cooperation)	2	9	14	15				
Standard 1020 – AtoN Design and delivery									
2.1.1	Review and update V-119 on the Implementation of Vessel Traffic Services (R0119) (Output to be a revised Recommendation and associated Guideline),(includes task 1.1.3)	1	8	12					Both for approval to Council
2.1.2	Develop Guideline on Port Traffic Signals	1	11	14					Likely to be next work plan
2.1.3	Develop E-112 Leading Lights and 1023 Leading Lines into a Guideline	1	9	14					Likely to be next work plan
2.1.4	Complete Guideline 1061 Illumination of structures	1	10	14					Likely to be next work plan
2.1.5	Update Guideline 1048 LED technologies and their use in signal lights	1	10	14					
2.1.6	Review & update guideline 1043 on Light sources Note: The old task in the 2014-2018 work period was Merge and update Guideline 1043 On Light Sources and Guideline 1048 on LED Technologies and Guideline 1049 on the Use of Modern Light Sources in Traditional Lighthouses (Task 5.1.9). Should this old task replace 2.1.5 and 2.1.6 as Task 2.1.5?	1	10	14					
2.1.7	Develop a guideline for E-106 Retroreflective materials	1	8	9					Completed
2.2.1	Develop E200-3 on light measurement into a Guideline	1	11	14					Likely to be next work plan
2.2.2	Develop new recommendation on marine light Terms of Measurement	1	12	14					Possibly needs to be pushed into new work plan

2.2.3	Develop E200-5 on Optical Performance into a Guideline	1	12	14					
2.2.4	Revise Guideline on effective intensity	1	9	11					Completed
2.2.5	Develop Guidance on monitoring of function and degradation of AtoN light sources	1	9	14					
2.2.6	~~Develop Guidance on service factor~~	~~1~~							
2.2.7	Develop Guidance on Colour fading of AtoN (plastic and painted) – methods to measure and assess	1	10	14					
2.2.8	Finish guideline G1148 Marine Signal Lights - Calculation of Luminous Intensity and Range Develop Guidance on service factors	1	8	10					Completed
2.2.9	Update Guideline 1041 on Sector Lights	1	9	14					
2.3.1	Develop guidance to identify appro priate standards for AtoN equipme nt with extreme environmental conditions. Humidity, temperature, enclosure ratings, UV etc) Also including peak intensity specification for LED AtoN, batteries, optic service factor, thermal cap, etc.	2/1	10	16					
2.3.2	Complete guidance on Maintenance of AtoN structures	2	8	12					Completed
2.3.3	Develop Guideline on meteorological and oceanographical data dissemination	2	8	14	16				
2.3.4	New Recommendation on the Responsible Design & Maintenance of AtoN (updated to include safety, sustainable design, and relevant building codes and standards)	2	8	10					Completed
2.3.5	Joint workshop with all 4 technical committees on Cyber Security in AtoN operations	2	8	12	14				
2.3.6	Develop Guideline on the Sustainable Structural Design of Marine Aids to Navigation	2	14	14					
2.4.1	Develop Guidance on what constitutes a good marine AtoN solar panel	2	10	14	16				
2.4.2	Deliver a Workshop - IALA AtoN Engineering	1	11	13	14				Deferred to next work period
2.4.3	Monitor Battery development for use in AtoN	2	8	14					
2.5.1	Develop guidance quantifying characteristics to meet nautical and operational requirements and ways to verify them	2	8	13	16				merged with 2.5.3
2.5.2	Develop new guideline on radar reflector (reflection) properties	2	8	13	16				
~~2.5.3~~	~~Creating an overview guidance on floating AtoN~~	~~2~~	~~8~~	~~13~~	~~14~~				merged in 2.5.1
2.6.1	Develop Guidance on modern equipment in traditional lighthouses	2	10	14					likely to be postponed 2023-2026

2.6.2	Monitor Climate Change to inform IALA of impact and potential adaptation requirements for AtoN providers	2	8	14					
2.6.3	1.1.1. IALA Heritage website: - Establish a World Heritage Lighthouse Cyber Centre, accessible via the IALA website. - Establish a database on World Heritage Lighthouses.	4	8	14					
2.6.4	Establish a concept for nominating one lighthouse as World Heritage Lighthouse of the year for each 'World AtoN Day'.	4	8	14					
2.6.5	Deliver Heritage Workshop	4	8	11	14				
2.7.1	Revise Recommendation R1004 to reference the UN Sustainable Development Goals	2	8	10	14				Completed
Standard 1030 – Radionavigation services									
3.1.1	Resilient PNT (applicable to all techical domains) – (identification, potential impact and mitigations)	3	8	11	15				
3.2.1	Terrestrial radionavigation systems	3	10	12					Completed
3.2.2	R-Mode (MF)	3	10	14	15				
3.2.3	R-Mode (AIS/VDES)	3	10	14					Task closed – VDES GL moved to ENAV
3.2.4	Workshop on R-Mode in 2019	3	9	10					Completed
3.2.5	Develop and maintain relevant Product Specifications eg. S-245 eLoran ASF data, S-246 eLoran transmitting station alamanc, S-247 Differential Loran reference station etc.	3	10	14	15				
3.2.6	Guidance on timing and synchronisation	3	8	14	15				Run over into the new work period
3.2.7	eRacon (standard approach) ; Review recommendations ENAV146 & R-101 & Guideline 1010	3	11	14	15				Run over into the new work period
3.3.1	Consideration of how and when to use SBAS in maritime.	3	9	13					Task complete topic ongoing
3.4.2	Review existing DGNSS infrastructure and provide guideance for current system	3	10	12	14	15			
3.4.3	New Recommendation on augmentation for maritime use	3	8	10	13				complete
3.4.4	Provide guidance, strategy and advice on potential new uses of marine beacon DGNSS infrastructure	3	9	11					Item merged with 3.4.2
3.4.5	High accuracy systems	3	10	14	15				Run over into the new work period
3.5.1	Review and update current documentation under the preview of PNT WG	3	8	14	15				
3.5.2	Monitor developments in GNSS, DGNSS, radar, resilient PNT, e-Pelorus, terrestrial systems, R-Mode, inertial and any other relevant areas etc.	3	8	14	15				

3.6.1	Update to ITU M.823, potential replacement for A.915, Liaison with IMO, ITU, RTCM, etc on related topics and project areas.	3	8	14	15				
3.7.1	Input to MSP, Integrity considerations for resilient PNT, cybersecurity impact for PNT data, DATUM considerations	3	10	14	15				
Standard 1050 Training and Certification									
4.1.1	Development and review of WWA courses	1,2,3	8	14					
4.2.1	Navguide updates and review	VC	9	14					
Standard 1060 – Digital communication technologies									
5.1.1	Review telemetry Guideline 1008	2	10	14					
5.1.2	Review of engineering support for e-navigation services, (including hot/cold climates & radio propagation). TO BE CONFIRMED	3	8	14	16				

Legend:

Green – progress as planned

Yellow – task needs more time, target time prolonged

Red – very little progress on the task, target time prolonged

Grey- task completed / deleted

Blank – task not started

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Report of the 14th Session of the IALA ENG Committee

1. GENERAL

The 13th session of the IALA AtoN Engineering and Sustainability Committee (ENG) was held virtually from 22 March to 19 April 2021.

There were a number of updates carried out in the Dashboard area in response to comments, concerns and requests from the previous session's virtual committee questionnaire and to fulfil the expectations of the Committee participants. As done in the previous session, the following platforms were used:

- MS Teams (to conduct meetings)
- Outlook Groups (to communicate with the Committee participants, sharing and seeking for document approval)
- Nextcloud Platform (to support the collaborative work of the committees, sharing documents, uploading, and downloading and make them available to all the Committees at any time)
- A major upgrade is done on the search engine which indexes the content of a repository of the current IALA standards, recommendations, guidelines, model courses and manuals, including the IALA Navguide, the VTS manual and the Complementary Use of Lighthouses manual. The result after inserting a specific word in the search engine is a relation of all the documents where the selected word appears;

Simon Millyard introduced himself and the WG chairs and welcomed newcomers to IALA.

1.1 Welcome from the IALA Secretary-General and Deputy Secretary-General

The Secretary-General, Francis Zachariae, welcomed all participants and was extremely glad to see them all, albeit on a computer screen. The Secretary-General expressed the wish to come back to normal again and 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 noted that on 1 July along with the international maritime community IALA and the members celebrated World Marine Aids to Navigation Day, the third in the series following the good work initiated in Palma de Mallorca, Spain, in 2019 and repeated virtually around the globe last year and this. The principal objective of this day was to promote greater awareness of IALA and its work by bringing to the attention of the wider public the role of marine aids to navigation and the significance of IALA's technical work in enhancing safety of navigation and protection of the environment. An excellent celebration of the Lighthouse of the Year, Cape Byron Lighthouse (Australia) also took place demonstrating the success of this concept. The Secretary-General expressed his gratitude to all the members for the arrangements of such events.

The topic of Maritime Autonomous Surface Ships or MASS was stressed, recalling the workshop of late May hosted by Japan which attracted more than one hundred participants from twenty-nine countries. The topic was presented to the Spanish-speaking members of IALA at the end of June hosted by Chile. The final report could be found as an input to ENG14. The Council decided to establish a MASS task force under the PAP to investigate IALAs involvement in MASS developments. The group held one meeting so far where all the committees are represented, the results are expected with interest. The Secretary-General highlighted the number of MASS related documents on ENG agenda for this meeting.

The Secretary-General informed about the a growing number of States having signed the Convention on the International Organization for Marine Aids to Navigation. It was noted that more than halfway through the year of the Convention counts with three ratifications/acceptances and fifteen signatures received from diplomatic representatives in Paris. Brazil expected to sign during the week bringing IALA up to sixteen. This progress surely embodies the respect that the new organisation will have based on the many years of IALA's growth, maturity and excellence.

The Secretary-General informed about the upcoming virtual workshops at the end of the year:

- Workshop on Cyber security in Marine AtoN operations in 15 to 19 November; and
- Workshop on Enhanced Radar Positioning System (ERPS) in 30 November to 2 December 2021.

The Secretary-General paid tribute to the efforts of IALA members during these difficult times with Covid-19. They have continued to provide aids to navigation so essential for the safety of marine traffic and the continuous facilitation of the global economy. The staff of IALA members have been (and still are) required to attend their normal workplace when responding to outages and maintenance required to keep their services operational. This devotion deserves special mention.

Lastly, the Secretary-General sadly informed of the death on 14 August of Mme Christiane Ville, former head of administration at IALA. Mme Christiane Ville was instrumental in the success of IALA over the many years she was part of the organisation, from its origins in 1957 to her retirement in 1991. Even after retirement she kept in touch and will be long remembered for her sound advice.

The Secretary-General wished all the participants good luck and thanked then once again for their contribution to global safety of navigation over this busy period.

1.2 Approval of the agenda

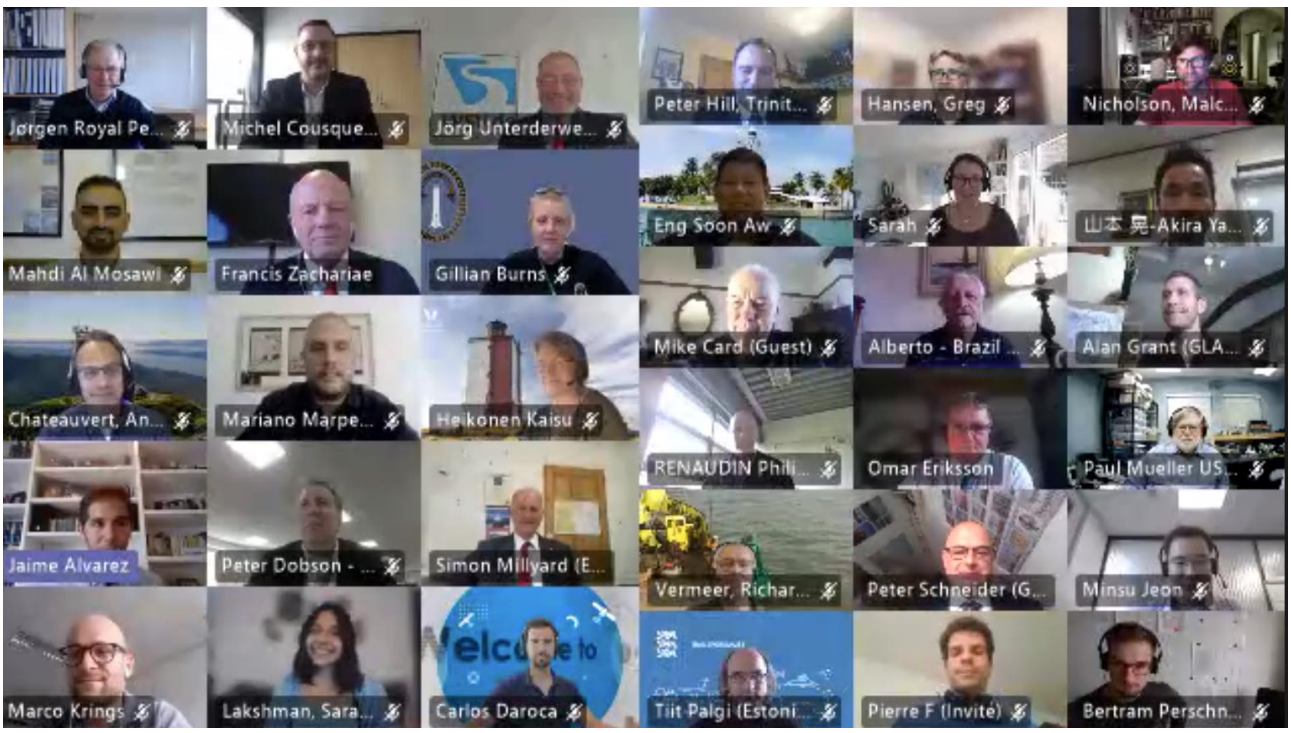
The agenda (ENG14-1.2.1) was adopted.

1.3 Apologies and Introductions

The session was attended by 114 registered participants from 30 countries. 13 participants attended for the first time.

The following chart shows an analysis of participants:

The list of Committee Members who attended ENG14 is shown in ANNEX B. New participants were welcomed in addition to those returning to the Committee.



1.4 Working arrangements for ENG14

The following statements were read to Committee members:

IALA is required to comply with the General Data Protection Regulations of the European Union. In the report of this meeting, IALA will include a list of participants with their contact information. Any participant who wishes to remove their personal information from the participants' list should advise the Committee Secretary as soon as possible.

If anyone present has knowledge of any patents, including pending Patents, held either by themselves or by other organisations or individuals, the use of which may be required to practice or implement the content of IALA Documents being developed or worked on in this Committee to inform the IALA Secretariat.

The Secretary briefly presented the Dashboard developed by IALA staff and will continue to be the One-Stop-Shop for conducting the Committees and centralised all the information, status and meeting needs for the member during the Committee working period. A new view of the calendar has been set up, providing a more understanding description of the meetings and discussions on going across the four Committees and within the ENAV Committee. A major upgrade is done on the search engine which indexes the content of a repository of the current IALA standards, recommendations, guidelines, model courses and manuals, including the IALA Navguide, the VTS manual and the Complementary Use of Lighthouses manual. The result after inserting a specific word in the search engine is a relation of all the documents where the selected word appears.

1.5 Style Guide

The Secretary presented the recently released IALA Style Guide designed to assist those members in preparing and reviewing IALA documentation. The purpose of this guide is to provide a common language, structure, and appearance.

This document is divided into three main parts:

- Style - Content (section 2) - this includes the preferred standards for grammar, language, punctuation, and spelling.
- Structure – Structure and formatting (section 3) - this includes how documents should be structured and ordered and includes the use of customised styles and fields in Microsoft Word.
- Appendices – including a supplementary table of spelling, a summary of the styles applied within the document templates and an extract from the IALA Brand Guidelines to illustrate the corporate colours.

1.6 ENG committee structure

The Chair then introduced and gave the floor to the Working Group Chairs and Vice Chairs:

- WG1 Light & Vision Physics chaired by Malcolm Nicholson
- WG2 Technical Knowledge and Sustainability chaired by Peter Schneider and Jörg Unterderweide
- WG3 Radionavigation Services chaired by Alan Grant
- WG4 Heritage Forum chaired by Peter Hill

2. REVIEW OF ACTION ITEMS FROM ENG13

Input paper ENG14-2.1.1 refers. Action items for the IALA Secretariat from ENG13 were noted as complete. WG chairs were requested to review Members actions.

3. REVIEW OF INPUT PAPERS

3.1 Input papers

It was noted that all input papers were available on the IALA website. The Committee considered 66 input papers, some of them were received the week before the opening plenary. Chairman recalled participants to forward the input papers before the deadline in order to provide enough time to be read

4. REPORTS FROM OTHER BODIES

4.1 Reports from IALA

4.1.1 IALA Council

Minsu Jeon, IALA Technical Manager, provided the committee with the report of Council 73 (ENG14-4.1.1.1), which was held in June 2021. The following points are relevant to note for the ENAV Committee:

The Council approve to extend the Committee work program 2018 - 2023

The Council approved three recommendations and nine guidelines:

New and revised recommendations:

- R0143 Provision of Virtual Aids to Navigation, Ed2.0, June 2021
- R1022 Provision of GNSS Augmentation Service for maritime applications, Ed1.0, June 2021
- R0110 Rhythmic characters on Aids to Navigation Ed5.0, June 2021

New and revised guidelines:

- G1081 Provision of Virtual Aids to Navigation, Ed.2.0, June 2021
- G1143 Unique Identifiers for Maritime Resources, Ed3.0, June 2021
- G1159 Ship Reporting from a shore-based perspective, Ed1.0, June 2021
- G1134 Surface colours used as visual signals on AtoN, Ed2.0, June 2021
- G1160 Competencies for planning and implementing a VTS, Ed1.0, June 2021
- G1141 Operational procedures for delivering VTS, Ed2.0, June 2021
- G1132 VTS Voice Communications and Phraseology, Ed 2.0, June 2021
- G1017 Assessment of prior learning exemption for VTS model courses, Ed2.0, June 2021
- G1161 Evaluation of Platforms for the Provision of Maritime Services in the Context of e-Navigation Ed1.0, June 2021

Documents for further committee consideration

The Council advised further committee discussion on the following documents:

- G1110 Use of decision support tools for VTS personnel

Cape Byron (Australia) was elected as lighthouse of the year and the proposal from ENG Committee to organise the Workshop on Enhanced Radar Positioning Service was also approved and to be held from 30 November to 2 December 2021.

4.1.1.1 Drivers & Trends

Simon Millyard stressed the fact that the Drivers and Trends document (ENG14-4.1.1.2) was discussed in depth during Council 72 where the Council look at 9 Maritime trends relative to AtoN.

1. Increased Digitalization, including big data and future communication;
2. Development of autonomous, automated and unmanned vessels;
3. Need for increased connectivity and interoperability;
4. Cyber-crime vulnerability and cyber security;
5. Changes in trade patterns due to global economic developments;
6. Large cruise ships going to remote locations like the Arctic;
7. Competing use of the oceans (Marine Spatial Planning); and

8. Demand for efficiency in the transport chain.

9. High demand for sustainable and environmentally friendly operations and development.

Chairman requested to bear in mind these points above when running out the work in the working groups and contacting him or the Secretariat with any proposals or items of interest on these Drivers & Trends.

4.1.1.2 Position document on the Development of AtoN

This document has the purpose of describing the Positions that IALA will take concerning certain critical technical and operational aspects of its work with the object of assisting the work of the technical Committees of IALA and informing IALA members. The Policy Advisory Panel has the task to maintain this document with the inputs from the Committees.

Simon Millyard highlighted that lights should remain as an important source of AtoN according to the IALA position document.

4.1.1.3 Heritage Lighthouse Award

WG4 Chair Mr. Peter Hill provided background on the accolade of IALA Heritage Lighthouse of the Year from 2019 first issued to Cordouan Lighthouse and in 2020 which has been conferred by Council upon Santo Antônio da Barra Lighthouse. This year, Cape Byron gained the award of Heritage Lighthouse of the Year.

Peter Hill recalled the importance of the culture and the heritage that these lighthouses provide beyond their function as AtoN.

Nominations are open for the 2022 accolade – this link is at IALA members disposal https://heritage.iala-aism.org/ for more information and get the template to submit information for the nomination.

4.1.2 IALA Policy Advisory Panel (PAP)

4.1.2.1 Technical Documents Catalogue

Chairman announced the updated publication made available by the secretariat, putting all the Standards, Recommendations and Guidelines together, the online version is at disposal of the members to look at the IALA documents.

4.1.2.2 Sustainability

Chairman also stressed sustainability is one of the vital aspects of the UN Sustainable Development Goals and highlighted in the Drivers and trends document. The Council is continuing to lead the activity to bring this goal to the IALA framework. Simon Millyard recalled the role of the Intergovernmental Panel on Climate Change and the assessment report published every four years. This is the most relevant and exhaustive study of the climate change and put the accent on the unequivocal fact that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. Simon Millyard expressed the need to think about what should be done in our fields in order to reduce such impact. Simon Millyard undertook during the last PAP to have a brainstorming session in what IALA can propose even in a radical view. These outcomes will be shared in the PAP in order to focus on the role of AtoN to reduce the global warm and climate change. All committee members are requested to submit through their WG chair any ideas, no matter how radical, on how to reduce the impact on the environment caused by AtoN provision. The ideas will be collated and presented to PAP for discussion.

The Assessment Report 6 on Climate Change 2021: The Physical Science Basis and the technical summary could be find through these links.

4.1.2.3 2023-2027 Work Plan

ENG Vice-Chair Michel Cousquer briefed about the document ENG Work plan draft 2023-2027 (ENG14-4.1.2.1) which is the result of the working groups preparations to achieve the number of tasks proposed for the next period 2023-2027. The tasks are split by Standards and the output document expected with each of the tasks. The tasks are also pre-allocated to a certain working group considering that the working group will remain the same during the next years. Vice-Chairs also expressed the possibility to comment on the plan

and any remark from the members will be heard. WGs are requested to review and add to this document to enable it to be considered a final draft after ENG14.

4.1.2.4 MASS task group

Captain Segar introduced the developments made in the IALA task force on MASS aiming at coordinating efforts and avoiding IALA miss the opportunity to contribute actively in such matter. The task force met on August 2021 to agree on the Terms of Reference (ToR) of such group. One of the main purposes of the group is the adequate monitoring of activities related to MASS in IALA in order to increase the synergies between different technical committees, avoid overlapping of tasks and propose workflows on specific scenarios to further develop. Next meeting is scheduled for November 2021.

Simon Millyard expressed the implication from ENG Committee to such matter and advance the outcome expected to be sent at the end of the session.

4.1.2.5 Revised Standards

IALA Standards aim at harmonizing AtoN worldwide to cover services and technologies and is the top-level technical document in IALA covering 34 technical topics. There is an action to review these Standards started during the previous committee seasons and will follow the process depicted below:

Organ and date	Activity	comment
Committees 2nd half 2021	Review the standards	
LAP 42	Review and provides advice on the draft standards edition 2.0	
PAP 43 in 2022	Complete the draft standards edition 2.0	
Council 76 in 2022	Approve forwarding the draft standards edition 2.0 to GA	
2nd half 2022	Information process to all members and other organisations	
GA in 2023	Approve the standards edition 2.0	Brazil

Figure 1 The standard review approval process

As presented in the table, there is an additional session to review the Standards.

4.1.2.6 Navguide revision

In parallel, Simon Millyard recalled the revision of the Navguide which will follow the structure of the Standards. The draft will be ready early next year 2022 for final approval. It is expected that the Navguide will be a living document, dynamic and easy to update according to the increasing of technologies and developments.

4.1.2.7 Recalling MBS review in ARM

The ARM Committee is reviewing the Maritime Buoyage System (ENG14-3.2.1.1) The Chairman thanked WG1 for their detailed comments on this at ENG13 led by Partel Keskkyla

4.2 IMO Meetings

Minsu Jeon presented the status of discussion on IMO meetings since the ENG13 and the implication of IALA on them:

NCSR 8 – April 2021. Following topics are of interest for IALA

- Revision of Recommendation ITU-R M.1371-5

- Recognition of the Japanese regional navigation satellite system QZSS as a component of the WWRNS
- Use of public broadband communication and technical standardization for public mobile networks in the context of maritime safety
- Progress on standards development by IEC (NCSR 8/13)
- Report on the monitoring of ECDIS issues by IHO (NCSR 8/13/1). Including an S-100 implementation roadmap.

MSC 103 – May 2021

- IALA submitted the following documents:
  - MSC 103/20/5 Opening for signature of the Convention on the International Organization for Marine Aids to Navigation (France and IALA)
  - MSC 103/20/9 IMO Member State Audit Scheme (IALA)
- MASS Regulatory Scoping Exercise finalised and further developments will be pursued on MSC104
- VDES: amend SOLAS Chapt. IV and Chapt. V to include VDES

4.3 IHO/IALA liaison

Minsu Jeon reported that the 5th IALA-IHO technical coordination meeting was held in April 2021. The session covered updates on S-100, and S-200, and S-124 and S-125. It was considered how to harmonise the terms and definitions of Marine AtoN and portrayal of IALA related product specifications. The joint workshop was postponed to next year in Norway on a face to face meeting. It is expected that IALA will join IHO HSSC to present the work of IALA and create a new domain for IALA in the portrayal registry, thus make official proposal on the portrayal of the IHO GI registry.

4.4 ITU

Please refer to the input paper to get further details - Maritime mobile service including Global Maritime Distress and Safety System (GMDSS) (ENG14-4.4.1); aeronautical mobile service and radiodetermination service - held its meeting from 10th to 21st May 2021.

The following documents and topics, among others are, of interest for IALA were reviewed:

- WP5B- continued working on the revision of Recommendation ITU-R M.2092-0. The group reviewed the input considering the intersessional work progressed (the structure and two open points reviewed) and further amended the document editorially. However ITU WP5B plenary did not adopt the document due to the need of editorial alignments with perceived ITU document standards, that WP5B maritime was not aware of. It is expected that the preliminary draft revision of Recommendation ITU-R M.2092-0 will be adopted by WP5B and approved by Study Group 5 at the next meeting in November 2021 as there were no technical questions raised anymore. For the IALA scope of work, it should be considered that IALA may update G1139 according to the development at ITU WP5B and is invited to further contribute to the work on the revision of Recommendation ITU-R M. 2092-0 as appropriate.
- Revision of Recommendation ITU-R M.1371-5 (Automatic Identification System - AIS). The group reviewed the liaison statements from IALA and CIRM answering specific questions from ITU. The liaison notes from IALA and CIRM highlight the complexity of the issue and the impact on the safety of navigation. WP 5B suggested that IALA and CIRM liaise closely with IMO to progress the work on the revision of Recommendation ITU-R M.1371-5. IALA is invited to consider the liaison statement and provide input on the issues to the next IMO/ITU joint expert group meeting November 1st to 5th 2021.
- WRC-23 agenda item 1.11 (Modernisation of the GMDSS and implementation of e-navigation).

4.5 IEC

Rodrigo Gonzalez presented the status of standardization activities progressing in IEC that the technical committees are monitoring and contributing to as part of their program:

Publication of new IEC 61108-7 standard for SBAS L1 receiver equipment for harbour entrances/approaches and coastal waters.

Two initiatives are contributing to such standardisation:

- WG8 on SBAS receiver performances for maritime applications lead and created by European Standardisation Committee CEN with the purpose to present the technical reports from MARESS in IEC TC80 (purely a liaison mechanism) and finally present the final draft of IEC-61108 Part 7 for SBAS to IEC Technical Committee 80 where the standard is expected to be approved by state members. The target deadline for this milestone is mid-2023.
- MARESS Project: The MARESS project is developing a new standard in the IEC 61108 series that will focus on SBAS L1 receivers for maritime applications. Named: *"DRAFT INTERNATIONAL STANDARD IEC 61108-7, Maritime navigation and radiocommunication equipment and systems – Global navigation satellite systems (GNSS) – Part 7: Satellite Bases Augmentation System (SBAS) L1 – Receiver equipment – Performance standards, methods of testing and required test results"*.

The achieved milestones were:

- CEN/CLC JT5 WG8 meeting on 21st September. For this meeting, it was presented the current status of the MARESS project and discuss the comments and open points of the draft proposed.
- Kick-Off meeting for IEC TC80 61108-7 CD prior the plenary for IEC TC 80 which is planned from 12th to 14th of October 2021.
- It was requested to join and participate in CEN European working group 8 at the end of 2021 planned next meeting and in the IEC Group TC80 PT61108-7 to develop and approve the standard (12 to 14 October) through the country representative.

4.6 RTCM

Alan Grant reported that there was little development at RTCM that was directly relevant to the ENG Committee.

4.7 PIANC

Minsu Jeon briefed about the monitoring activity of IALA in the work in PIANC, any subject in the scope of IALA will be coordinate with them.

4.8 CIE

Alwyn Williams ENG WG1 vice-Chair reported on CIE, the focused was put in dedicated software ensuring that quantity of light was properly calculated. The intention is to improve the support to professional measuring the quantity of light.

The work on effective intensity has not progressed further.

The division 4 on transportation is working on service condition factor in IALA terminology in order to provide guidance.

4.9 Digital@Sea

Minsu Jeon recalled the late paper on Digital@Sea initiative: The Highlight of Digital at Sea AP 2021 (ENAV28-4.9) reporting the outputs of Digital@Sea Asia Pacific 2021. The webinar of the initiative is available in the youtube channel. Next meetings as follows:

- Digital@Sea International in 2023
- Digital@Sea Asia-Pacific in Q3 2022
- Digital@Sea North-America in Tampa Florida 26-26 January 2022

4.10 ESBN Tsunami monitoring

IALA Secretariat was contacted by ESBN to contribute with their task force on Augmenting Tsunami Monitoring frame Committee on October.

5. REPORTS FROM RAPPORTEURS

5.1 Enhanced Radar Positioning System (ERPS)

Paul Mueller who is leading the task on ERPS provided a briefing on the task and the IALA workshop on Standardisation of ERPS scheduled from 30 November to 2 December. Paul explained that during the drafting of the IALA Guideline on ERPS, a need for standardisation raised and it is requested to identify where it is needed standards to progress on ERPS. This is the primary goal of the workshop.

6. ADVERTISING ONLINE PRESENTATIONS

The following presentations were scheduled during the working period and the links to the records are available:

6.1. Drones, Inspection and use in Ireland / Eoghan Lehane (Commissioners of Irish Lights)

6.2. SBAS standardisation / Rodrigo Gonzalez (ESSP)

6.3. ERPS workshop / Paul Mueller

6.4. WWA / Kevin Gregory

6.5. Galileo Timing for R-Mode – Testing campaign / Gema Cueto-Felgueroso

6.6. Workers and Light Keepers Courses: a new training level / Julio Fidel Sierra, GEOCUBA

7. OVERVIEW OF PLANNED WORK FOR ENG14

The working group Chairs informed participants about the tasks expected to be developed during the Committee session. Such tasks and activities could be consulted in the ENG14 action plan section of the Dashboard.

7.1. WG 1 - Visual & Physical AtoN - Malcolm Nicholson

7.2. WG 2 - Knowledge & Sustainability - Peter Schneider/ Jörg Unterderweide

7.3. WG 3 - Radionavigation Services - Alan Grant

7.4. WG 4 - Heritage - Peter Hill

8. ESTABLISH WORKING GROUPS

8.1 Establishing working groups

Four working groups were established, as outlined below. A list of working group participants is at **Erreur ! Source du renvoi introuvable.**.

Working Group		Working Group Chair	Working Group Vice Chair
WG 1	Visual & Physical AtoN	Malcolm Nicholson	Alwyn Williams
WG 2	Knowledge & Sustainability		Peter Schneider Jörg Unterderweide
WG 3	Radionavigation Services	Alan Grant	Michael Hoppe
WG 4	The Heritage Forum	Peter Hill	Jonghun Kim

9. WORKING GROUP 1 – VISUAL & PHYSICAL ATON

The working group met virtually during ENG14 and was made up of 19 members and they considered 10 input papers. Some of the papers received were for information, whilst others were input to developing guidelines. The main aim of this session was to continue the work identified in the work program and update the task register.

An additional task, not on the work programme was a minor editorial amendment to IALA G1065 with regard to the equation for Geographical Range. This was completed during the session and agreed by the working group.

Action Item

*The **Secretariat** is requested to forward the revision of Guideline 1065 on AtoN signal light beam vertical divergence (ENG14-12.1.1) as per Input paper ENG14-3.1.1.7 to the Council.*

9.1 Develop Guideline on Port Traffic Signals (Task 2.1.2)

This task commenced at ENG10 following the results of a survey conducted by the ARM Committee and is expected to take two sessions to complete. The survey found that although authorities using the traffic signal codes could produce the codes, they were having some issues with the practical implementation. Due to other work items taking longer than anticipated, this task is postponed until the next work programme. However, some input is expected during the present work programme.

9.2 Develop E-112 Leading Lights and 1023 Leading Lines into a Guideline (Task 2.1.3)

Input papers were received and discussed during the working group task sessions. The main aim of this work is to produce a revised Recommendation, Guideline, Excel Calculator and a Tutorial Paper. More importantly the 'hidden' equations in the existing calculator have been revealed and captured so that this knowledge is not lost to IALA members.

Action Item

***Frank Hermann** and **Pärtel Keskküla** are requested to arrange an intersessional meeting to progress the work on the development of G1023 Leading Line.*

9.3 Update Guideline 1048 LED technologies and their use in signal lights (Task 2.1.5)

No input was received for ENG14. Given the other tasks of the WG and the time left in the work programme it is proposed that this task be moved to the next work programme.

Action Item

***Michel Cousquer** is requested to remove Task 2.1.5 for the 2018-2023 work programme and add it to the 2023-2027 work programme.*

9.4 Review & update guideline 1043 on Light sources (Task 2.1.6)

Refer to 9.5 (Task 2.1.5)

9.5 Develop E200-3 on measurement of light into a Guideline (Task 2.2.1)

An input paper (ENG13 3.1.1.9) on this subject was received from China MSA. This task was due to start at ENG11 for four sessions. However, this work can only be started when task 2.2.2 on Marine Light Terms of Measurement has been completed. Refer to task register ENG8-12.2.12 for scope of work.

Action item

*The **Secretariat** is requested to forward input paper ENG14-7.1.2 to ENG15 as a working paper.*

9.6 Develop new Recommendation on Marine Light Terms of Measurement (Task 2.2.2)

The working paper on this subject was reviewed over two sessions, with some progress being made. Due to the complex and potentially far-reaching nature of the document it was decided that more consideration was to be given on the definitions. An alternative suggested title for this recommendation was proposed as 'Marine Signal Lights: Standard Performance Characteristics'.

Action item

***Alwyn Williams** is requested to arrange an intersessional meeting to progress the work on Marine Light Terms of Measurement*

9.7 Develop E200-5 on Optical Performance into a Guideline (Task 2.2.3)

An input paper was received and briefly reviewed. However, the WG felt that the sessions dedicated to this topic would be better spent developing the Leading Lines documents. Now that the E-200 series has been converted into Recommendations and Guidelines the group discussed what to do with the Overview E-200-0. It was decided that other IALA Publications cover the topics within E-200-0 and that it should be withdrawn. In addition, it has been superseded by IALA Guideline 1148 and the Technical Documents Catalogue.

Action item

***Malcolm Nicholson** is requested to continue to work on the Guideline on Optical Performance and Calculation and submit an Input Paper to ENG15.*

*The **Secretariat** is requested to forward a Liaison Note to Council that IALA Recommendation E-200-0 be withdrawn (ENG14-12.1.2).*

9.8 Revise Guideline on effective intensity (Task 2.2.4)

Completed at ENG12

9.9 Develop Guidance on monitoring of function and degradation of AtoN light sources (Task 2.2.5)

Moved to 2023-2027 Work Programme

9.10 Develop Guidance on service factors (Task 2.2.6)

Task completed in ENG10 as it has been incorporated into Guideline G1148.

9.11 Develop Guidance on Colour fading of AtoN (plastic and painted) – methods to measure and assess (Task 2.2.7)

Completed at ENG13

9.12 Finish Guideline G1148 Marine Signal Lights - Calculation of Luminous Intensity and Range (Task 2.2.8)

Task completed at ENG10.

9.13 Update G1041 on Sector Lights to define 'Angle of Uncertainty' (Task 2.2.9)

This task was due to start at ENG9 for two sessions. However, due to working on other documents this task was not started. The original liaison note from ENG7 was reviewed and it was agreed that although the present definition is a little confusing, it was still extant. The work on the definition is being done as part of Task 2.2.2 on Terms of Measurement. It was agreed that G1041 was in need of a general review and that should be a work item for the next work programme.

Action Item

***Michel Cousquer** is requested to add the revision of G1041 on Sector Lights as a task to the 2023-2027 work programme.*

9.14 Deliver a Workshop - IALABATT/ IALALITE (Task 2.4.2)

Following the approval from Council and a submission from Australia to host the workshop, a steering committee meeting was held during ENG12. A decision to postpone the workshop until the next work programme was made.

10. WORKING GROUP 2 – KNOWLEDGE & SUSTAINABILITY

The Working Group was joined by 29 members of 15 nations who participated in nine Task Groups. The Working Group reviewed 40 input papers. Some of these documents were for information, some Liaison notes and the remainder were input to the guideline development.

The key tasks for the ENG14 session for Working Group 2 are highlighted below; however, the overarching goal was to continue with the work as identified in the 2018-2022 work programme.

10.1 Review and update Guideline 1097 (Task 1.1.1.)

This task is continued by ARM, since both "G1058 Use of Simulation as a Tool for Waterway Design and AtoN Planning" and "G1097 Technical Features and Technology Relevant for Simulation of AtoN" are supported by ARM. ENG has co-coupled the work of ARM and is ready for further support.

10.2 Third party quality control (Task 1.2.1.)

The draft guideline was forwarded to the ARM Committee for their review and ARM sent a Liaison note saying that there are no significant comments, but more detailed reference to the IALA World Wide Academy AtoN model courses in section 3.1.4 is recommended. This amendment will be done at ENG15

Action Item

*The **Secretariat** is requested to forward the draft guideline on "Third Party AtoN Provider Quality Control" (ENG13-12.2.2) and ARMs Liaison note to ENG15.*

10.3 Extreme environmental conditions (Task 2.3.1.)

The Task Group consisted of 18 participants, with varied assistance (between 7 to 14) through four sessions over the ENG14 period.

The Task Group worked from Draft Guideline in extreme environmental conditions ENG13 version, and continued develop topics such as General Overview, the incidence on AtoNs of Tropical Cyclones, Tsunamis, Humidity, Fog, Soil and Coastal morphology changes, and strong tidal currents.

The Guideline will be reviewed at ENG15 and during next two intersessional meetings planned to do in December and February. Organizations including Chilean Navy, Geocuba and MENAS contributed with strong data of these topics mentioned and other contributions and observations from other Organizations including Cerema and Waterways Department of Estonian Transport. The Task Group members have continued developing this document, sharing data from different regions with similar extreme environmental conditions but with different solutions and will continue at ENG15.

During the ENG 14 a simple entry matrix was developed allowing users to quickly identify the interrelation between the occurrence of extreme weather events (variables) and their impact on Aids to Navigation, and thus, the equipment installed in them.

Action Item

Regarding the interconnection of this Draft Guideline with Guideline G1108 "The Challenges of Providing AtoN Services in Polar Regions" and Guideline 1136-Ed.1 "Providing-AtoN-Services-In-Extremely-Hot-and-Humid-Climates, the task to merge them to obtain a unique document covering all the environmental problematic should be developed for next work plan 2022 – 2026.

*The **Secretariat** is requested to forward the draft Guideline on Extreme Environmental Conditions (ENG14-14.2.10) document to ENG15.*

*The **Committee participants** are requested to share their experiences covering the challenges of provision of AtoN services in polar or extreme hot and humid climates with examples from their specific areas for ENG15 to obtain a unique document considering all the environmental problematic .*

10.4 Develop Guideline on meteorological and oceanographical data dissemination (Task 2.3.3.)

The Task Group changed the title slightly to express that the acquired data contains more than just hydrographic data. One session was held for brainstorming and updating of the title and structure. It was recognizsed that additional content is necessary such as an overview of examples of different sensor types and sensors, additional examples for visualisation, information on data validation, examples for data transmission and energy supply of sensors as well as cross references to existing IALA guidelines.

Action Item

*The **Secretariat** is requested to forward the draft guideline on meteorological and oceanographical data dissemination (ENG14-14.2.5) as working paper to ENG15.*

10.5 Develop Guideline on the Sustainable Structural Design of Marine Aids to Navigation (Task 2.3.6)

WG 2 received a new Task which was initiated by WWA on Develop Guideline on the Sustainable Structural Design of Marine Aids to Navigation. The draft Guideline was further developed during three session. It was forwarded for silent approval.

Action Item

*The **Secretariat** is requested to forward the guideline on the Sustainable Structural Design of Marine Aids to Navigation (ENG14-12.2.1) for council approval.*

10.6 Solar Panel Guideline (Task 2.4.1)

The task group met on 3 separate occasions throughout the ENG 14 period. The meetings were attended by 11 participants from 7 different countries, providing a good spread of experience.

The task group received 4 input papers, providing useful information which was able to be integrated into the guideline. The group made good progress finalising the input to several sections along with a general review of the whole document. This now allows the document to move on to an editorial phase.

It is anticipated that an editorial review of the document will be progress intersessionally.

Action Items

*The **Secretariat** is requested to forward the draft guideline on Solar Panel (ENG14-12.2.6) as a working document to ENG15 Committee meeting.*

10.7 Develop guidance quantifying characteristics to meet nautical and operational requirements and ways to verify them (Task 2.5.1)

The Task Group met three times during ENG14 working period, initial discussions on the requirements of the new Guideline were undertaken. The meetings were attended by 13 participants from 7 different countries. The Buoy Overview document for Task 2.5.3 was discussed and it was decided to combine both tasks and integrate the 'Overview' document into the new Task 2.5.1.

Several papers were discussed including WSV Technical Concept Classification of Floating AtoN and hydrodynamic design and testing of new buoy systems by Trinity House. Brainstorming discussions during the second meeting included different buoy types used by different nations, the slight alteration to the structure of the document including environmental and climate considerations. The assistance of buoy manufactures was discussed and the Working Group would benefit from additional input from a manufacturer representative. Additional photos and examples were discussed and several were suggested by Trinity House.

The structure of the document was developed further in the third meeting with references to other IALA documents distributed throughout the relevant headings from the content of the 'Overview' document.

Work will continue intersessionally, with an email being issued in approximately one month (from the end of ENG14), to invite members to arrange a date to reconvene. The task group are asked to review the draft document (on file-share) and cross check the references to IALA documents to ensure they are appropriate.

Action Items

*The **Secretariat** is requested to forward the draft guideline on quantifying characteristics to meet nautical and operational requirements and ways to verify them (ENG14-12.2.7) as a working document toENG15 Committee meeting.*

*The **Committee participants** and specially buoy manufacturers are requested to forward additional photos and examples to develop guidance quantifying characteristics to meet nautical and operational requirements and ways to verify them . Manufacturers representatives are invited to participate the Task Group at ENG15.*

10.8 Radar Reflector (Task 2.5.2.)

The task group had one meeting throughout the ENG 14 period. The meeting was attended by 10 participants from 3 different countries. The Task Group received simulation results for different radar reflector types from WSV Germany. These were discussed and validated. It was recognised that the scale of the provided date should be normalized for incorporating into the guide line.

Further discussion was about the range of radar reflectors and its calculation. The CARPET-Software could be an appropriate tool. The group decided to have intersessional meetings. WSV plans to undertake further measurements on floating buoys (in situ).

Action Items

*The **Secretariat** is requested to forward the draft guideline on radar reflector (ENG14-12.2.8) as a working document to ENG 15 Committee meeting.*

10.9 Creating an overview guidance on Floating AtoN (Task 2.5.3.)

This task was amalgamated with Task 2.5.1 (see Task 2.5.1)

10.10 Review of IALA World-Wide Academy model courses (Task 4.1.1.)

The Working Group reviewed three IALA World-Wide Academy Marine Aids to Navigation Level 2 Technician courses: Module 7 1&2 Racons. Module 1.14 Power sources on buoys & Module 1.13 Maintenance of steel buoys.

The content and scope of the model courses were reviewed, and minor changes were proposed. All courses passed the silent approval process.

Input paper ENG14-3.2.9 on Pre-job training course for buoy tender crew was presented to WWA by China MSA.

Action items

*The **Secretariat** is requested to forward Input paper on Pre-job training course for buoy tender crew to IALA World-Wide Academy ENG14-3.2.9 to prove whether it could be an additional WWA training course.*

*The **WWA** is requested to report their decision about the use of Input paper ENG14 3.2.9 on Pre-job training course for buoy tender crew to ENG15.*

Action item

*The **Secretariat** is requested to forward the 3 reviewed WWA L2 course to Council for approval.*

10.11 Review telemetry Guideline 1008 (Task 5.1.1.)

The Task Group met once during ENG14 working period allowing the review of this guideline to progress. The meetings were attended by 5 participants from 3 different countries.

The group updated the structure of the document and recognised the need of new content regarding optimising energy consumption of PLCs/RTUs as well as new data transmissions possibilities.

Work will continue at ENG15.

Action Item

*The **Secretariat** is requested to forward the draft Guideline "G1008 on remote control and monitoring of marine aids to navigation" (ENG14-12.2.9) to ENG15.*

Additional items

In addition to the scheduled work on the work plan, all Working Groups in the ENG committee were asked to contribute to the following 2 papers:

1. Sustainability proposals for consideration at PAP
2. Work within ENG relevant to MASS for the MASS Task Group

These two output papers were developed during ENG14 and following input from all WGs, they passed silent approval

Action item

*The **Secretariat** is requested to forward the Liaison note to PAP with Proposals for enhancing Environmental Sustainability*

*The **Secretariat** is requested to forward the Liaison note to PAP and to the MASS Task Group referencing work & guidance within ENG relevant to MASS*

11. WORKING GROUP 3 – RADIONAVIGATION SERVICES

The WG Chair and Vice Chair express their gratitude to WG participants for their hard work and effort during this busy period. The WG Chair and Vice Chair would also like to thank all of the Task Group leaders for their time and effort in progressing their work items in this new approach.

As the new IALA document share will not be cleared after each meeting, working documents have been placed in a folder marked as such within each task's sub-folder.

11.1 Resilient PNT (Task 3.1.1)

During this session the draft guideline on resilient PNT was progressed, with the latest version carried over as a working document. It is envisaged that this task will continue with a view of finalising the draft at ENG15.

Action item

*The **Secretariat** is requested to forward the draft Guideline on resilient PNT (ENG14-12.3.4) to ENG15.*

11.2 Terrestrial radionavigation systems (Task 3.2.1)

This item has been completed.

11.3 R-Mode (MF) (Task 3.2.2)

The Committee progressed the development of the draft Guideline on R-Mode implementation using MF radio beacons and VHF transmissions. The Committee reviewed two input documents associated with timing and an R-Mode test bed in Korea (ENG13-3.1.3.2 and ENG13-3.1.3.6).

The latest version of the draft Guideline has been put in the working documents folder for further consideration at ENG15.

Action item

*The **Secretariat** is requested to forward the draft Guideline on R-Mode implementation using MF radio beacons and VHF transmissions (ENG14-12.3.5) to ENG15.*

11.4 R-Mode (AIS/VDES) (Task 3.2.3)

At ENG12 it was agreed that the technical specification of R-Mode activities over AIS/VDES frequencies would be managed by the ENAV Committee. The R-Mode (MF) Guideline would include operational considerations for all R-Mode configurations.

11.5 Workshop on R-Mode in 2019 (Task 3.2.4)

This item has been completed.

11.6 R-Mode testbed progress coordination (Task 3.2.5)

The Committee received an update on the Korean R-Mode test bed.

11.7 Develop and maintain relevant product specifications (Task 3.2.6)

The latest versions of the eLoran station almanac (S-246) and differential eLoran reference station almanac (S-247) product specifications were provided for the Committee's consideration as an output from ENG13. No comments were received and the final draft versions are now ready to be passed to the secretariat for upload to the website.

It is anticipated that work on S-245 will be progressed at ENG15.

Action item

*The **Secretariat** is requested to upload S-246 eLoran station almanac and S-247 differential eLoran reference station almanac Product Specifications to the IALA website for further testing.*

11.8 Guidance on timing and synchronisation (Task 3.2.7)

There was no work on this Task during this session. A new task lead has been identified and it is anticipated that work on this item will start at ENG15.

11.9 eRacon (standard approach); Review recommendations ENAV146 & R-101 & Guideline 1010 (Task 3.3.1)

The Committee reviewed input papers provided by ETSI TGMARINE to ENG13. A liaison note to ETSI TGMARINE has been developed thanking them for their information and inviting them to consider the impact of Racons in busy harbours, and to invite them to liaise with IALA.

The Committee also received a presentation on the planned workshop on the standardisation of the Enhanced Radar Positioning System.

Action item

*The **Secretariat** is requested to forward liaison note ENG14-12.3.2 "On radar standards" concerning racons to Council for approval and after been accepted to the ETSI TGMARINE via Andrea.Lorelli@etsi.org with copy to pete.hizzey@wanadoo.fr.*

11.10 Consideration on how and when to use SBAS (Task 3.4.1)

The Committee considered a revision to IALA Guideline G-1129 "The Retransmission of SBAS corrections using MF Radio beacon and AIS". Given the amendments to the document, the revised version will be held as a working document with a view to it being approved at ENG15.

Action item

*The **Committee participants** are invited to consider the updated version of G1129 The Retransmission of SBAS corrections using MF Radio beacon and AIS, located on the share file and to provide comments to the WG3 Chairman (Dr Alan Grant - alan.grant@gla-rad.org) prior to ENG15.*

11.11 Review of existing DGNSS infrastructure and provision of guidance for current system (Task 3.4.2)

The Committee reviewed the response from PAP to the request from RTCM for guidance on the need for version 2.4 of the RTCM broadcast standard.

The Committee progressed the Guideline on DGNSS with the latest version carried over to ENG15.

Action item

*The **Secretariat** is requested to forward the draft Guideline on DGNSS (ENG14-12.3.6) to ENG15.*

11.12 Recommendation on augmentation for maritime use (Task 3.4.3)

This item has been completed

11.13 Provide guidance, strategy and advice on new uses of marine beacon DGNSS infrastructure (Task 3.4.4.)

This work item has been merged with Task 3.4.2 and will be closed.

11.14 High accuracy systems (Task 3.4.5.)

The Committee reviewed the existing Guideline related to high accuracy systems (G1127 - systems and services for high-accuracy positioning and ranging) and updated the document with a view of completing it at ENG15.

Action item

*The **Secretariat** is requested to forward the draft review Guideline on high accuracy systems (ENG14-12.3.7) to ENG15.*

11.15 Review and update current documentation under the purview of PNT WG (Task 3.5.1)

The Committee reviewed the Radionavigation Services Standard and provided comments to the Secretariat.

Action item

*The **Secretariat** is requested to forward the revisions on S1030 to PAP.*

11.16 Monitor developments in GNSS, DGNSS, radar, resilient PNT, e-Pelorus, terrestrial systems, R-Mode, inertial and any other relevant areas etc. (Task 3.5.2)

The Committee discussed a number of general topic areas including how we could work differently to reduce emissions, MASS and the future work programme, with updates provided to the Chair and Vice Chair of the Committee.

11.17 Liaison with sister organisations (IMO, ITU, RTCM etc.) on related topics (Task 3.6.1)

The Committee reviewed the work of the IMO Correspondence group on the development of a Generic GNSS receiver performance standards. IALA has been supporting the work of the correspondence group and the way forward was discussed. The Committee felt that greater clarity in the longer term aims of the generic receiver performance standard would help support its development and uptake.

The secretariat is invited to consider seeking clarity on the future vision of these generic GNSS receiver performance standards and how they will align with the existing multi-system receiver performance standard.

Action item

*The **Secretariat** is invited to consider seeking clarity on the future vision of these generic GNSS receiver performance standards and how they will align with the existing multi-system receiver performance standard.*

11.18 Input to MSP, Integrity considerations for resilient PNT, cybersecurity impact for PNT data, datum considerations (Task 3.7.1)

The Committee reviewed the maritime service portfolio items on resilient PNT and AtoN and will seek advice from the Secretariat on how to take proposed amendments forward.

11.19 Development and review of WWA courses (Task 4.1.1)

No updates during this session.

11.20 NAVGUIDE updates and review (Task 4.2.1)

The Committee reviewed the radionavigation section of the NAVGUIDE (ENG14-12.3.1) and provided the updated text to the Secretariat.

12. WORKING GROUP 4 – THE HERITAGE FORUM

ENG WG4 – Heritage Forum considers its overall objective to be;

"To further the declaration and recommendations contained within the Incheon Declaration and within IALA Recommendation R1005 – 'Conserving the built heritage of lighthouses and other aids to navigation'.

Over the course of ENG 14, WG4 received the participation of 22 persons from 10 national members.

BAE	Yong Chan	Republic of Korea	Ministry of Oceans and Fisheries
BURNS	Gillian	Scotland	Northern Lighthouse Board
CHACON	Tatiana	El Salvador	AMP
GUO	Zhenyu	People's Republic of China	China Maritime Safety Administration (MSA)
HILL	Peter	UK - England	Trinity House
JIANG	Tianyin	People's Republic of China	China Maritime Safety Administration (MSA
KIM	Jonghun	Republic of Korea	Ministry of Oceans and Fisheries - Paichai University
LAKSHMAN	Sarah-Jane	Australia	Australian Maritime Safety Authority (AMSA)
LAZAR	Nisrine	Morocco	Ministère de l'Equipement
LI	Ai	People's Republic of China	China Maritime Safety Administration (MSA
LINGYAN	Wang	People's Republic of China	China Maritime Safety Administration (MSA)
LIU	Juan	People's Republic of China	China Maritime Safety Administration (MSA)
LIU	Ke	People's Republic of China	China Maritime Safety Administration (MSA)
NAKAJIMA	Tomoya	Japan	Japan Coast Guard
NOGUCHI	Hideki	Japan	Japan Coast Guard
PARK	Sihyeon	Republic of Korea	The Institute of Aids to Navigation (National Lighthouse Museum)
PAVEZ	Luis	Chile	Armada de Chile
PIOVESANA Jr.	Alberto	Brazil	Diretoria de Hidrografia e Navegação of the Brazilian Navy
RANXUAN	Ke	People's Republic of China	Navigation Institute of JiMei University
WOOD	Amy	Australia	AMS Group
YONGBIN	Ji	People's Republic of China	China Maritime Safety Administration (MSA
ZHANG	Pu	People's Republic of China	China Maritime Safety Administration (MSA)

The group met twice over the course of ENG14 – on Tuesday 5th October and on Tuesday 19th October. In addition to the above participation list, the group were pleased to be joined for its first meeting by Jaime Alvarez from IALA Secretariat. Meetings were chaired by **Peter Hill** and **Jonghun Kim** was Vice-Chair.

In addition to the papers and presentations leading to outputs, WG4 was also delighted to receive a fascinating presentation from **Liu Ke of** China MSA on the ENG14 Input Paper 3.1.4.3; Presentation on "*The benefits brought by the volunteer lighthouse keeper to the sustainable development of lighthouse*".

12.1 Heritage seminar (Task 2.6.5)

Alberto Piovesana Jr reported that it would not be possible for a Heritage Seminar to take place alongside or adjacent to the IALA General Assembly in Rio, Brazil 2023. Instead it is proposed that the Heritage Seminar be held in virtual form in August 2022 and hosted by Directorate of Hydrography and Navigation, Brazil. Additionally, it may be possible (dependant upon further evaluation) for participants of the Heritage Seminar who are also in attendance at the IALA General Assembly 2023. to receive an in-person tour of a heritage lighthouse there.

Action Items

Alberto Piovesana Jr (Diretoria de Hidrografia e Navegação of the Brazilian Navy) *is requested to liaise intersessionally with IALA Secretariat to establish the feasibility of running a virtual Heritage Seminar in August 2022 hosted by Directorate of Hydrography and Navigation, Brazil, if agreed, to commence developing the seminar, liaising with other IALA members as required, and to report back to ENG15*

*The **Secretariat** is requested to facilitate the arrangements for a virtual Heritage Seminar in August 2022 hosted by Directorate of Hydrography and Navigation, Brazil and, if viable to assist with the logistics as appropriate.*

12.2 IALA Heritage Lighthouse of the Year 2021 – Cape Byron Lighthouse, Australia (Task 2.6.4)

WG4 were pleased to receive a short update from **Sarah-Jane Lakshman** of Australian Maritime Safety Authority (AMSA). The award designed and produced by Korea had been gratefully received.

12.3 IALA Heritage Lighthouse of the Year (IALA HLY) 2022 (Task 2.6.4)

12.3.1 The means of making a commendation

The arrangements for IALA HLY 2022 would continue on the basis of it being an informally commended accolade (see following section on IALA HLY 2023 and beyond).

Nominations remain open for IALA HLY 2022 with the deadline for the submission of nomination forms to be the 28th February 2022. All nominations previously submitted would also be re-considered.

WG4 were pleased to receive an informal paper and presentation from **Gillian Burns** (NLB) entitled *'Selection process for heritage lighthouse of the year at ENG15; proposal for wording of acknowledgement email from IALA on receipt of nomination form'.* The judging panel would be comprised of willing participants in attendance at the first WG4 meeting of ENG15.

The paper proposed that each judge would submit the top 9 lighthouses that they considered should be IALA Heritage Lighthouse of the Year 2022 with those 9 lighthouses receiving ranking points in their order – their favoured lighthouse 10 points, their second favoured 8 points, third favoured 7 points and so on. They would submit their ranking points to WG4 Chair in advance of the second meeting of WG4 at ENG15 to allow the Chair to amalgamate the ranking points. These amalgamated ranking points would not on their own determine the commendation of WG4, but will facilitate the discussion at its second meeting.

After some discussion, the proposal was accepted by WG4 with the following provisos;

- WG4 Chair to make nominations available to all ENG14 WG4 participants as soon as possible after 28th February 2022 to maximise the time for consideration by those planning to partake in WG4 at ENG15.

- Should this model be used in future years, the ratio of lighthouses given ranking points against those not given ranking points should be reviewed – especially as the number of nominated lighthouses increases.

12.3.2 The Artwork for the IALA HLY

The Republic of Korea had generously designed and sponsored the artwork over the last three years. As previously set out at ENG13, 2021 was scheduled to be the last year of that commitment. However, an informal paper was tabled by **Sihyeon Park** (National Lighthouse Museum, ROK) suggested 'Design and production of the award for IALA Heritage Lighthouse of the Year after 2021'

That paper proposed that from 2022, the Republic of Korea would consider taking on production of identical plaques and delivery to the awards for 5 years (up to and including 2027). Subject to agreement, the Republic of Korea would propose 2 or 3 plaques in FEB 2022 intersessional WG4 meeting and decide one of them before ENG 15 for ENG Committee & WG4's consideration and agreement.

An alternative proposal had been made as part of the China MSA Input paper (see following item). That proposal would require the holders of the accolade in any given year being required to produce the award for the following year. This was generally considered by WG4 to be too onerous on the accolade holder – especially when the holder may not have been the organisation that nominated its lighthouse. The award could be seen by some as a burden rather than an honour and so may have a chilling effect on nominations and even see the withdrawal of existing nominations and the requested removal of lighthouses from the Heritage Lighthouse database.

With such a generous alternative proposal on the table from the Republic of Korea, it was agreed that WG4 would like to commend to ENG Committee the grateful acceptance of that offer.

12.3.3 Acknowledgment of Nominations for IALA HLY

The afore-mentioned paper and presentation from **Gillian Burns** (NLB) raised the issue of communication with nominees. Whilst receipt of a nomination form was acknowledged, no information was provided as to what would happen next. It was agreed that wording along the lines of the following should be used and requested that IALA Secretariat incorporate similar wording into their acknowledgement emails when nominations are received;

> *"Thank you for your nomination, it will be considered at the IALA ENG15 meeting of the Heritage Working Group in March/April 2022, at which commendations will be made for final determination at the IALA Council meeting in June 2022. It is planned that IALA Lighthouse of the Year accolade will be announced on World AtoN Day 2022, please follow IALA for updates (twitter / facebook)."*

Action Items

*The **Committee participants** are encouraged to submit nominations for IALA Heritage Lighthouse of the Year 2022 and/or to encourage colleagues within their organisations to do so, and to note the deadline for nominations of 28th February 2022.*

*The **Secretariat** is requested to encourage IALA National Members to submit nominations for IALA Heritage Lighthouse of the Year 2022 and, when received, to set out in an acknowledgement email what will happen to the nomination.*

*That **Sihyeon Park (National Lighthouse Museum, ROK)** conveys IALA's grateful acceptance to the Republic of Korea for its offer to provide the award for IALA HLY up until 2027 and proposes 2 or 3 plaque designs at ENG15 for ENG Committee & WG4's consideration.*

12.3.4 IALA Heritage Lighthouse of the Year (IALA HLY) 2023 and beyond (Task 2.6.4)

WG4 were pleased to receive a presentation from **Guo Zhenyu** from China MSA on ENG14 Input Paper 3.1.4.2 *Modification proposal for improving the selection mechanism of IALA Heritage Lighthouse of the Year* from China MSA. The paper and presentation centred around proposals for a more competitive version of IALA HLY than currently exists.

The subsequent discussion revealed two very different visions for the future of the accolade were held by participants of WG4. These visions are summarised as follows;

1. **Continuing as an informally commended accolade**

   Each year, ENG WG4 form a Judging Panel that selects, by consensus which nominated lighthouse it wishes ENG Committee to commend to Council as IALA HLY together with its reasons. The decision is then made by IALA Council. The judging panel consider the cultural, historic and conservation aspects of each nominated lighthouse but also other factors which may cause a particular lighthouse to be a good choice in a particular year for raising the profile of lighthouse heritage and culture. There is no 'winner' and no sense that the accolade holder is 'the best' in any way. However, recognition is given to the particular qualities of the lighthouse and there is an opportunity to celebrate this. An award has been presented each year to mark the accolade.

2. **Developing IALA HLY into an annual competition with a systematically selected winner**

   IALA HLY could instead be developed into a competition with an annual winner. That annual winner would be the lighthouse that the judges on a judging panel scored highest using detailed criteria and scoring mechanisms. Judges would receive training and have a degree of expertise in lighthouse heritage. There would be strict criteria to ensure transparency and objectivity. Nominees would be expected to show commitment to the award – perhaps presenting to the judging panel and fielding questions from it.

It was considered premature to consider the detailed proposals outlined in the Input Paper for implementing the second of those visions before first resolving in which of the two future directions the accolade was to go.

After considerable discussion, it did not prove possible for a consensus to be reached within WG4 on two such contrasting visions. WG4 therefore seek the input and direction of ENG Committee as to which of these two general directions it wishes IALA LHY to go.

Regardless of the outcome, WG4 consider the discussion to be timely and positive – not least so there can be greater ongoing consensus and understanding of the nature of the accolade across IALA.

Action Items

*The **Committee participants** are requested to provide direction to WG4 as to whether it wishes to see IALA HLY develop into an annual competition with a systematically selected winner or for it to continue as an informally commended accolade.*

12.5 Heritage Lighthouse Database and Cybercentre (tasks now combined and re-named 'IALA Heritage Webpage') (Task 2.6.3.& 2.6.4)

WG4 were delighted with how the IALA Heritage website had developed and thanked **Gillian Burns** and **Sihyeon Park** for the work they had put into data input and editing this as WG4's Heritage Website Task group. Gratitude was also expressed to IALA Secretariat for the work they had put into making this project happen.

Action Items

*That **Gillian Burns** (NLB) and **Sihyeon Park** (National Lighthouse Museum, ROK) are requested to continue to ensure that the IALA Heritage website is up-to-date, accurate and complete, directly undertaking editorial changes and liaising with IALA Secretariat and with Peter Hill (WG4 Chair) as necessary.*

*The **Secretariat** is requested to assist the editing team on the IALA Heritage website in their role as editors as required.*

12.6 Consideration of matters to progress into the work program 2023-2027

WG4 tasks in the draft Task Plan 2023-2027 were noted and agreed. WG4 participants were again encouraged to submit comments to **Amy Wood** (AMS Group) on her draft proposals for the Heritage Module to the IALA Level 1.1 course that had been presented at ENG13.

Additional proposals would be welcomed for discussion at ENG15 and WG4 participants are encouraged to submit such in the form of a paper considering the practicalities of the proposal

Jonghun Kim (Paichai University, Republic of Korea) highlighted how useful and interesting it is to hear about the wide range of lighthouse heritage around the world and that it would be good to hear more such perspectives.

Action Items

*The **Committee participants** are requested to note WG4's satisfaction with the draft task plan proposals in so far as they relate to WG4 and to submit further Heritage proposals for consideration at ENG15*

*The **Committee participants** are encouraged to present to WG4 on topics of lighthouse heritage affecting their member organisations.*

13. REVIEW OF OUTPUT AND WORKING PAPERS

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

14. REVIEW OF SESSION REPORT

The report of the meeting (ENG14-14.1) was considered and approved. Committee Participants were requested to advise any corrections/amendments within one week, following which the final version of the report will be issued via the IALA web site.

Action item:

*The **Secretariat** is requested to forward the summary of the ENG14 Committee report (ENG14-14.1) to Council to note.*

15. DATE AND VENUE OF NEXT MEETING

The next session of the ENG Committee is planned to be held from 07 to 11 March 2022 at Headquarters, Saint Germain-en-Laye. The secretariat will continue to monitor global events of the COVID-19 pandemic and advise its Members of any changes that may be instigated..

Other IALA events will be publicised on the IALA website.

16. CLOSE OF THE MEETING

The Committee Chairman thanked the Vice-Chair, working group Chairs and all Participants for their hard work and output during the session and the four-year work period. He thanked the IALA Secretariat for their support.

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 Input Papers

A list of input papers is at ANNEX C.

4 Output and Working papers

A list of output and working papers is at ANNEX D.

5 Action Items

A list of action items is at ANNEX E.

ANNEX A

14th Meeting of the AtoN Engineering and Sustainability Committee (ENG14)

The 14th meeting of the **AtoN Engineering and Sustainability Committee** will be held from 4 October – 2 November 2021 virtually.

The opening plenary will commence at 1000 – 1200 UTC on Monday 4 October 2021, and the closing plenary will begin at 1000 – 1200 UTC on Tuesday 2 November.

AGENDA

Opening Plenary

2.	Introduction		
	2.1.	Welcome address from the Secretary-General/Deputy Secretary-General	
	2.2.	Approval of the agenda	Simon Millyard
	2.3.	Apologies and Introductions	Simon Millyard
	2.4.	Working arrangements	Jaime Alvarez
	2.5.	Style Guide	Jaime Alvarez
	2.6.	ENG committee structure	Simon Millyard
	2.6.1.	WG1 Overview	
	2.6.2.	WG2 Overview	
	2.6.3.	WG3 Overview	
	2.6.4.	WG4 Overview	
3.	Review of action items from last meeting		Simon Millyard / Jaime Alvarez
	3.1.	Review of action items from ENG13	
4.	Review of input papers		Simon Millyard
	4.1.	Review of input papers to ENG 14	
	4.2.	Input papers for action/allocation	
5.	Reports from other bodies		
	5.1.	IALA	
	5.1.1.	IALA Council	
	5.1.1.1.	Documents approved by Council	Minsu Jeon
	5.1.1.2.	Drivers & Trends	Simon Millyard
	5.1.1.3.	Position document on the Development of AtoN	Simon Millyard
	5.1.1.4.	Heritage Lighthouse Award	Peter Hill
	5.1.2.	IALA Policy Advisory Panel (PAP)	
	5.1.2.1.	Technical Documents Catalogue	Simon Millyard

5.1.2.2.	Sustainability	Simon Millyard
5.1.2.3.	2023-2027 Work Plan	Michel Cousquer
5.1.2.4.	Update on MASS task group	Captain Segar
5.1.2.5.	Standards revision	Minsu Jeon
5.1.2.6.	NavGuide revision	Minsu Jeon
5.1.2.7.	Recalling MBS review in ARM	Simon Millyard
5.2.	IMO	Minsu Jeon
5.3.	IHO	Minsu Jeon
5.4.	ITU	Minsu Jeon
5.5.	IEC	Rodrigo Gonzalez
5.6.	RTCM	Alan Grant
5.7.	PIANC	Minsu Jeon
5.8.	CIE	Alwyn Williams
5.9.	Digital@Sea	Minsu Jeon
5.10.	ESBN Tsunami monitoring	Minsu Jeon

6. Reports from rapporteurs

6.1.	Enhanced Radar Positioning System (ERPS)	Paul Mueller

7. Advertising Online Presentations (planned during the working period)

7.1.	Drones, Inspection and use in Ireland (Commissioners of Irish Lights)	Eoghan Lehane
7.2.	SBAS standardisation	Rodrigo Gonzalez (ESSP)
7.3.	ERPS workshop	Paul Mueller
7.4.	WWA	Kevin Gregory
7.5.	Galileo Timing for R-Mode – Testing campaign	Gema Cueto-Felgueroso

8. Overview of planned work for ENG14

8.1.	WG 1 - Visual & Physical AtoN	Malcolm Nicholson
8.2.	WG 2 - Knowledge & Sustainability	Peter Schneider/ Jörg Unterderweide
8.3.	WG 3 - Radionavigation Services	Alan Grant
8.4.	WG 4 - Heritage	Peter Hill

9. Establish Working Groups and Task Groups
10. END OF OPENING PLENARY
11. Working Groups/Task Groups progress work plan
12. CLOSING PLENARY
13. Review of output and working papers
14. Review of session report
15. Date and venue of next meeting
16. Close of meeting — Simon Millyard

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ANNEX C

LIST OF INPUT PAPERS

All papers were posted to the Committee website

Meeting	Agenda Item	Output Paper Title	Source	Action
ENG14	1.2.1	Draft Agenda	IALA Secretariat	All
ENG14	2.1	Report of ENG13 (ENG13-2.1.1)	IALA Secretariat	All
ENG14	2.1.1	Review of action items from ENG14	IALA Secretariat	All
ENG14	3.0	Input paper Committee meeting template	IALA Secretariat	All

ENG14	3.0.1	List of Input papers	IALA Secretariat	All
ENG14	3.1.1.1	Cover note on IALA Documents on Leading Lines	WSV / ETA	WG1
ENG14	3.1.1.2	Revised Guideline 1023 on Design of Leading Lines	WSV / ETA	WG1
ENG14	3.1.1.3	Revised spreadsheet of the Leading Line Design Programme	WSV / ETA	WG1
ENG14	3.1.1.4	Tutorial for Revised Spreadsheet	WSV / ETA	WG1
ENG14	3.1.1.5	Cover note Review of R0200	GRAD	WG1
ENG14	3.1.1.6	R0200 Marine signal lights - Part 0 - Overview	GRAD	WG1
ENG14	3.1.1.7	G1065 Correction to Equation	GRAD	WG1
ENG14	3.1.1.8	Input paper Dual Intensity Lantern	MPA	WG1
ENG14	3.1.2.1	Cover note Sustainable Structural Design of Marine Aids to Navigation	WWA	WG1
ENG14	3.1.2.2	Draft Guideline Sustainable Structural Design of Marine Aids to Navigation v1.0	WWA	WG1
ENG14	3.1.2.3	Intersessional Input - Problems and failures associated with solar modules V7	ENG WG2 intersessional	WG2
ENG14	3.1.2.4	Intersessional Input - Testing of solar modules V4	ENG WG2 intersessional	WG2
ENG14	3.1.2.5	Intersessional Input - Procurement of solar modules V3	ENG WG2 intersessional	WG2
ENG14	3.1.2.6	Solar charge controller	China MSA	WG2
ENG14	3.1.3.0	Plan for WG3 work over the ENG14 period	WG3 Chairs	WG3
ENG14	3.1.3.1	G1229 update proposal InputPaper v1.1	EUSPA/ESSP	WG3
ENG14	3.1.3.1.1	G1129 update proposal v0.2	EUSPA/ESSP	WG3
ENG14	3.1.3.2	Galileo Timing for R-Mode Pilot Project v1.1	EUSPA/GMV	WG3
ENG14	3.1.3.3	Progress on the Study of RBN-based Differential Loran-C Technologies	China MSA	WG3
ENG14	3.1.3.4	eLoran Product Specification Development	KRISO/MOF	WG3
ENG14	3.1.3.5	Maritime Precise Positioning and Integrity Monitoring Project Preliminary Results	KRISO/MOF	WG3
ENG14	3.1.3.6	Status update of the Korean R-Mode testbed project (TRACE)	KRISO/MOF	WG3
ENG14	3.1.3.7	KPS and Maritime POINT R&D Project Status	KRISO/MOF	WG3
ENG14	3.1.4.1	WG4 proposal	Peter Hill	WG4
ENG14	3.1.4.2	Modification proposal for improving the selection mechanism of Heritage Lighthouse of the Year	China MSA	WG4
ENG14	3.1.4.3	The benefits brought by the volunteer lighthouse keeper to the sustainable development of lighthouse	China MSA	WG5

ENG14	3.2.1	Liaison note to all committees on the final draft revision of MBS R1001 ARM13-11.2.5	ARM	All
ENG14	3.2.1.1	Draft WP The IALA Maritime Buoyage System (ARM13-11.2.5.1)	ARM	All
ENG14	3.2.1.2	Marine aids to navigation SAMPLE	ARM	All
ENG14	3.2.2	VTS Update - Revision to IMO Resolution A857(20)	VTS	All
ENG14	3.2.2.1	Enclosure - Draft IMO Resolution & Draft Guideline G1089	VTS	All
ENG14	3.2.3	Draft_IMT_(3GPP)_Reco-WG2 review-rev2 (ENAV27-12.2.3)	ENAV	All
ENG14	3.2.4	Draft_IMT_(3GPP)- Guideline_WG2 review-rev2 (ENAV27-12.2.4)	ENAV	All
ENG14	3.2.5	Report on the IALA Workshop on marine AtoN in the autonomous world	IALA Secretariat	All
ENG14	3.2.6	Draft MASS Recommendation (ENAV27-12.2.1)	ENAV	All
ENG14	3.2.7	Draft MASS Guideline (ENAV27-12.2.2)	ENAV	All
ENG14	3.2.8	Input paper on the report of IALA WS on MASS	ENAV	All
ENG14	3.2.9	Pre-job training course for buoy tender crew	China MSA	All
ENG14	3.2.10	Draft revision S1010 AtoN Planning and Service Requirements (for review 2nd half 2021)	IALA Secretariat	All
ENG14	3.2.11	Draft revision S1020 AtoN Design and Delivery (for review 2nd half 2021)	IALA Secretariat	All
ENG14	3.2.12	Draft revision S1030 Radionavigation Services (for review 2nd half 2021)	IALA Secretariat	All
ENG14	3.2.13	Draft revision S1040 Vessel Traffic Services (for review 2nd half 2021)	IALA Secretariat	All
ENG14	3.2.14	Draft revision S1050 Training and Certification (for review 2nd half 2021)	IALA Secretariat	All
ENG14	3.2.15	Draft revision S1060 Digital Communication Technologies (for review 2nd half 2021)	IALA Secretariat	All
ENG14	3.2.16	Draft revision S1070 Information Services (for review 2nd half 2021)	IALA Secretariat	All
ENG14	3.2.17	Level 2 AtoN technician model courses for review	WWA	All
ENG14	3.2.17.1	IALA Model Course C2001-8 L2 Module 1.13 Maintenance of Steel Buoys Ed.2 June 2016	WWA	All
ENG14	3.2.17.2	IALA Model Course C2001-9 L2 Module 1.14 Power Sources on Buoys Ed.2 June 2016	WWA	All
ENG14	3.2.17.3	IALA Model Course C2007-1 L2 Module 7.1&2 Racons Ed.2 June 2016 rev3	WWA	All
ENG14	4.1.1.1	Council73 Report Final	Council	All
ENG14	4.1.1.2	Draft Current Drivers and Trends Ed2.0 (C73-8.1.1)	Council	All
ENG14	4.1.1.3	IALA Position Document on the Development of Marine AtoN Services 2019	Council	All
ENG14	4.1.2.1	Technical documents Catalogue	IALA Secretariat	All

ENG14	4.1.2.3	ENG Work plan draft 2023 2027	IALA Secretariat	All
ENG14	4.1.2.5	Standards revision	IALA Secretariat	All
ENG14	4.1.2.5.1	Structure of the standards	IALA Secretariat	All
ENG14	4.2.1	Report on IMO MSC and NCSR	IALA Secretariat	All
ENG14	4.3	Report IHO IALA Technical 5th Coordination Meeting final	IALA Secretariat	All
ENG14	4.4.1	IALA Report of ITU-R WP5B meeting 10 to 21 May 2021	Stefan B	All
ENG14	4.4.1.1	R19-WP5B-C-0355!N39!MSW-E - Reply liaison statement to IALA+CIRM on rev ITU-R M1371-5	Stefan B	All
ENG14	4.9	ENG14- The Highlight of Digital at Sea AP 2021	Digital@Sea	All

LIST OF OUTPUT AND WORKING PAPERS

ANNEX D

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

Meeting	Agenda Item	Output Paper Title	Source	Action
ENG14	12.0.1	Liaison note on Work & guidance within the Engineering & Sustainability Committee relevant to MASS	WG1	MASS Task force
ENG14	12.0.2	Liaison note on Proposals for enhancing Environmental Sustainability	WG1	All Committees / PAP
ENG14	12.1.1	Input to Council on G1065 AtoN signal light beam vertical divergence	WG1	Council
ENG14	12.1.1.1	Revision of Guideline 1065 on AtoN signal light beam vertical divergence	WG1	Council
ENG14	12.1.2	Liaison Note to Council that IALA Recommendation E-200-0 be withdrawn	WG1	Council
ENG14	12.2.1	GXXXX Sustainable Structural Design of Marine Aids to Navigation	WG2	Council
ENG14	12.2.2	IALA Model Course C2001-8 L2 Module 1.13 Maintenance of Steel Buoys Ed.2 June 2016 post review	WG2	WWA
ENG14	12.2.3	IALA Model Course C2001-9 L2 Module 1.14 Power Sources on Buoys Ed.2 June 2016 post review	WG2	WWA

ENG14	12.2.4	IALA Model Course C2007-1 L2 Module 7.1&2 Racons Ed.2 June 2016 rev3 post review	WG2	WWA
ENG14	12.3.1	NAVGUIDE 2018 WG3 amendments (ENG14)	WG3	PAP
ENG14	12.3.2	Liaison Note to ETSI TGMARINE on Radar standard	WG3	Council
ENG14	12.3.3	Draft revision S1030 Radionavigation Services (for review 2nd half 2021)- WG3	WG3	PAP

Working papers will remain within the Committee for further review during ENG14.

Meeting	Agenda Item	Working Paper Title	Source	Action
ENG14	12.2.5	WP draft Guideline on meteorological and oceanographical data dissemination	ENG14	ENG15
ENG14	12.2.6	WP draft Guideline on Solar Panel	ENG14	ENG15
ENG14	12.2.7	WP draft guideline on quantifying characteristics to meet nautical and operational requirements and ways to verify them	ENG14	ENG15
ENG14	12.2.8	WP draft guideline on radar reflector	ENG14	ENG15
ENG14	12.2.9	WP draft G1008 on remote control and monitoring of marine aids to navigation	ENG14	ENG15
ENG14	12.2.10	WP Draft Guideline on Extreme Environmental Conditions	ENG14	ENG15
ENG14	12.3.4	WP Draft Guideline on resilient PNT	ENG14	ENG15
ENG14	12.3.5	WP draft Guideline on R-Mode implementation using MF radio beacons and VHF transmissions	ENG14	ENG15
ENG14	12.3.6	WP draft Guideline on DGNSS	ENG14	ENG15
ENG14	12.3.7	WP draft review Guideline on high accuracy systems	ENG14	ENG15

ACTION ITEMS

Action Items for Secretariat

ANNEX E

23. The **Secretariat** is invited to consider seeking clarity on the future vision of these generic GNSS receiver performance standards and how they will align with the existing multi-system receiver performance standard. 26
24. The **Secretariat** is requested to facilitate the arrangements for a virtual Heritage Seminar in August 2022 hosted by Directorate of Hydrography and Navigation, Brazil and, if viable to assist with the logistics as appropriate. 27
25. The **Secretariat** is requested to encourage IALA National Members to submit nominations for IALA Heritage Lighthouse of the Year 2022 and, when received, to set out in an acknowledgement email what will happen to the nomination. 28
26. The **Secretariat** is requested to assist the editing team on the IALA Heritage website in their role as editors as required. 29
27. The **Secretariat** is requested to forward the summary of the ENG14 Committee report (ENG14-14.1) to Council to note. 30

Action Items for Participants

28. **Frank Hermann** and **Pärtel Keskküla** are requested to arrange an intersessional meeting to progress the work on the development of G1023 Leading Line. 18
29. **Michel Cousquer** is requested to remove Task 2.1.5 for the 2018-2023 work programme and add it to the 2023-2027 work programme. 18
30. **Alwyn Williams** is requested to arrange an intersessional meeting to progress the work on Marine Light Terms of Measurement 19
31. **Malcolm Nicholson** is requested to continue to work on the Guideline on Optical Performance and Calculation and submit an Input Paper to ENG15. 19
32. **Michel Cousquer** is requested to add the revision of G1041 on Sector Lights as a task to the 2023-2027 work programme. 20
33. The **Committee participants** are requested to share their experiences covering the challenges of provision of AtoN services in polar or extreme hot and humid climates with examples from their specific areas for ENG15 to obtain a unique document considering all the environmental problematic . 21
34. The **Committee participants** and specially buoy manufacturers are requested to forward additional photos and examples to develop guidance quantifying characteristics to meet nautical and operational requirements and ways to verify them . Manufacturers representatives are invited to participate the Task Group at ENG15. 22
35. The **WWA** is requested to report their decision about the use of Input paper ENG14 3.2.9 on Pre-job training course for buoy tender crew to ENG15. 23
36. The **Committee participants** are invited to consider the updated version of G1129 The Retransmission of SBAS corrections using MF Radio beacon and AIS, located on the share file and to provide comments to the WG3 Chairman (Dr Alan Grant - alan.grant@gla-rad.org) prior to ENG15. 25
37. **Alberto Piovesana Jr (Diretoria de Hidrografia e Navegação of the Brazilian Navy)** is requested to liaise intersessionally with IALA Secretariat to establish the feasibility of running a virtual Heritage Seminar in August 2022 hosted by Directorate of Hydrography and Navigation, Brazil, if agreed, to commence developing the seminar, liaising with other IALA members as required, and to report back to ENG15 27
38. The **Committee participants** are encouraged to submit nominations for IALA Heritage Lighthouse of the Year 2022 and/or to encourage colleagues within their organisations to do so, and to note the deadline for nominations of 28th February 2022. 28

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