



# REPORT OF THE 6<sup>TH</sup> SESSION OF THE IALA ATON ENGINEERING AND SUSTAINABILITY (ENG) COMMITTEE

27 to 31 March 2017

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# Report of the 6<sup>th</sup> Session of the IALA

## AtoN Engineering and Sustainability (ENG) Committee

### 27 to 31 March, 2017

### Executive Summary

The sixth meeting of the ENG Committee (ENG6) was held from 27<sup>th</sup> to 31<sup>st</sup> March 2017 in IALA HQ.

The session was attended by 56 participants from 24 countries, of which 34 were National Members, 10 were Industrial Members, 7 were Associate Members, 5 were observers. Seven participants attended for the first time.

The Committee considered 107 input papers including presentations and produced 25 output documents including 5 revised Academy model courses, 2 draft Recommendations, 1 draft Guideline and 20 working papers. Good progress was made with aligning the Recommendation E-200 series with the emerging IALA Standards.

The workshop on Sustainable Light & Power for the Next Generation hosted by the German Federal Waterworks and Shipping Administration in Koblenz in March 2017 was successfully completed and outputs were further developed at ENG6.

Review of relevant sections of the Navguide progressed in accordance with the workplan.

Under the Academy distance learning programme, five participants passed modules of the level 1 AtoN managers' course during ENG6. A further four participants studying will attend the module 3 training at IALA HQ in April 2017.

Support for the Academy continued with revision of five model courses and review of a further five reformatted model courses.

The ENG Committee work plan for the work period 2014-2018 was updated in the light of emerging developments. The following table shows a summary of progress while progress on each work task to date is shown in ANNEX F of the meeting report.

Task	Number Tasks	Progress Indicator			Status Overview
		Green	Yellow	Red	
TD#1 – Light and vision physics	8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All tasks progressing per current plan.
TD#2 – AtoN design and maintenance	8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All tasks progressing per current plan except 3 tasks which are extended to ENG7.
TD#3 – Global capacity building and training	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All tasks progressing per current plan.
TD#4 – Civil engineering and environment	4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Tasks delayed by 1 session to ENG7.
Across all domains	18	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All tasks progressing per current plan except tasks 5.1.1 and 5.1.12 which are extended to ENG7 and task 5.1.11 which is delayed until the 2018-22 work period due

Task	Number Tasks	Progress Indicator			Status Overview
		Green	Yellow	Red	
					to insufficient time.

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# Report of the 6<sup>th</sup> Session of the IALA ENG Committee

## GENERAL

The 6<sup>th</sup> session of the IALA AtoN Engineering and Sustainability Committee (ENG) was held from 27<sup>th</sup> to 31<sup>st</sup> March 2017 at IALA. The Chairman was Simon Millyard and the Vice Chairman was David Jeffkins. The Secretary for the meeting was Seamus Doyle.

### 1. OPENING

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

#### 1.1 Approval of the agenda

The agenda (ENG6-1.2) was adopted.

#### 1.2 Welcome from the IALA Deputy Secretary-General

The Secretary-General of IALA, Mr Zachariae, welcomed all participants to IALA. He thanked the German Federal Waterways and Shipping Administration for the fantastic workshop in Koblenz the previous week and made a small presentation to Jörg Unterderweide. He noted the good progress with the new IALA logo and reformatting of the IALA documents and emphasised that IALA remains the IALA family operating in a technical efficient friendly way. He briefed the meeting on the progress of transition of IALA from NGO to IGO status, with two preparatory diplomatic conferences envisaged in 2017 ahead of the diplomatic conference in Incheon in May 2018. He invited submission of abstracts for papers for the 2018 IALA conference in Incheon, Republic of Korea, in 2018. He invited contributions to the World Heritage Exhibition to be held with the IALA conference. He noted the good progress of the Academy. Noting that 2017 is the 60<sup>th</sup> anniversary of the establishment of IALA in 1957, he said that a special issue of the bulletin will mark this historic event as well as a celebration in December 2017.

#### 1.3 Administration and safety brief

Seamus Doyle provided a Safety and Administration briefing.

A working space file sharing system has been set up on the IALA website to facilitate intersessional meeting.

#### 1.4 Introductions and Apologies

The session was attended by 56 participants from 24 countries, of which 34 were National Members, 10 were Industrial Members, 7 were Associate Members, 5 were observers. Seven participants attended for the first time.





The list of Committee Members who attended ENG6 is shown in ANNEX B. The Committee noted apologies from Members who were unable to attend as noted in ANNEX B.

### **1.5 Programme for the week**

The programme for the week, paper ENG6-1.4, was approved.

## **2. REVIEW OF ACTION ITEMS FROM ENG5**

Input paper ENG6-2.1 refers. Action items for the IALA Secretariat from ENG5 were noted as complete except of action 19 where clarification regarding the task was required. 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. It was observed that the input papers for each Working Group (WG) were identifiable from the document number. The Committee considered 107 input papers including presentations.

### **3.2 Identify input papers suitable for uploading to the IALA Wiki**

It was agreed that papers ENG6- 9.18 and ENG6-9.19 should be uploaded to the IALA Wiki.

#### *Action Item*

*David Jeffkins is requested to upload the input papers ENG6- 9.18 and ENG6-9.19 onto the IALA Wiki.*

## **4. REPORTS FROM OTHER BODIES**

### **4.1 Reports from IALA Council – 63<sup>rd</sup> Session**

The Committee noted the report of the 63<sup>rd</sup> Session of the IALA Council held in Lisbon, Portugal, from 13<sup>th</sup> to 16<sup>th</sup> December 2016. Paper ENG6-4.1 refers.

### **4.2 Report of the 32<sup>nd</sup> Session of the IALA Policy Advisory Panel**

The Committee noted the report of the 32<sup>nd</sup> Session of the IALA Policy Advisory Panel (PAP32), from 5<sup>th</sup> to 7<sup>th</sup> October 2016 in IALA HQ. Paper ENG5-4.2 refers.

### **4.3 Report IALA Workshop on Sustainable Light & Power for the Next Generation, Koblenz**

The Committee noted the report of the IALA Workshop on Sustainable Light & Power for the Next Generation held in Koblenz from 20<sup>th</sup> to 24<sup>th</sup> March 2017. The attention of the Committee was drawn to sections 3 and 13 of the report.

### **4.4 Draft IALA Standards**

At Council session 62, the Council agreed the names of the first seven IALA Standards and noted the proposed subsidiary topic areas. The Committee was requested to submit comments on the seven draft Standards to Council session 64. Papers ENG6-4.4.1, ENG6-4.4.2, ENG6-4.4.3, ENG6-4.4.4, ENG6-4.4.5, ENG6-4.4.6, ENG6-4.4.7, and ENG6-4.4.8 refer.

### **4.5 Report IALA Workshop on AIS AtoN developments, Seoul, 19-20 Oct 2016**

The Committee noted the report of the IALA workshop on AIS AtoN developments held in Seoul, Republic of Korea from 19<sup>th</sup> to 20<sup>th</sup> October 2016. Paper ENG6-4.5 refers. The Ministry of Oceans and Fisheries in Korea were thanked for hosting the workshop.

#### **4.6 Report e-Navigation Underway International 2017**

The Committee noted the report of the e-Navigation Underway International 2017 conference held on board the DFDS ferry M/S PEARL SEAWAYS from 31<sup>st</sup> January 2017 to 2<sup>nd</sup> February 2017. Planned trial of autonomous ships in shipping channels was highlighted. Paper ENG6-4.6 refers.

#### **4.7 Position on the Development of AtoN Services**

The Committee noted the position paper on the development of AtoN Services. The paper described the positions that 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. Paper ENG6-4.7 refers.

### **5. REPORTS FROM RAPPORTEURS**

#### **5.1 Developments in Renewable Energy Sources**

Peter Dobson reported on developments in solar technology, batteries and fuel cells, referring to presentations at the IALA workshop on Sustainable Light and Power for the next Generation.

#### **5.2 Developments in Battery Technology**

Jonas Lindberg referred to presentations made at the IALA workshop on Sustainable Light and Power for the next Generation, with particular reference to new technology batteries. Lead crystal batteries are an emerging technology and participants were invited to comment on the application of this technology in AtoN provision.

#### **5.3 Developments in New Light Sources**

Alwyn Williams reported on draft Guidelines on lights that were produced by the IALA workshop on Sustainable Light and Power for the Next Generation.

#### **5.4 CIE-IALA Liaison**

Alwyn Williams reported that CIE are again voting on the decision to adopt the modified Allard method of calculating effective intensity at threshold. This will complete the groundwork and a new CIE technical committee will be established to further the work on effective intensity.

#### **5.5 Developments in AtoN Simulation Systems**

Junki Bae made a proposal for the 2018-2022 work plan to provide guidance and a manual for an AtoN Simulator administrator on Operation and Management for AtoN Simulator. It was noted that the simulator requires a purpose built simulator facility and cannot be run on a laptop computer. Paper ENG6-10.33 refers.

#### **5.6 Developments in remote control and monitoring**

Peter Schneider reported on latest developments in remote control and monitoring. Papers ENG6-5.6 and ENG6-5.6.1 refer.

#### **5.7 IALA Dictionary**

David Jeffkins gave a short update on the IALA Dictionary.

#### **Action**

*Committee Members are requested to ensure that definitions in IALA documents are consistent with the Dictionary.*

#### **5.8 IALA Bulletin liaison**

David Jeffkins briefed the Committee on the need for contributions to the IALA Bulletin. Bulletin issues will be in June and December each year with eBulletin issues at two month intervals.



## Action

ENG Committee members are requested to submit articles for the IALA Bulletin to Marie-Helene Grillet.

## 6. PRESENTATIONS

Seven presentations were made during the opening plenary session. The presentations are available on the IALA Committee website.

### 6.1 IALA World-Wide Academy (WWA) – Stephen Bennett

Gerardine Delanoye described the recent activity in the Academy since ENG5. Input paper ENG6-6.1 refers.

### 6.2 Developments in NT solid state radar systems and racons

Philip Wilson from Slipstream Design described a new racon system that works effectively with NT radar, maintaining the range of racons when triggered by magnetron radars. It was noted that the envisaged racon power consumption is 1 watt average but depends on the number of interrogating radars. There are no issues regarding IPR patents in relation to IALA activities. There may be need to revise IALA guidance regarding racons in relation to interrogating pulse length. Paper ENG6-6.2 refer.

### 6.3 Mini VTS system in Portugal

Manuel Santos described a system to create a decision support system for the Local Maritime Authority (LMA) with the longer term aim of development of a Costa Segura (Safe Coast), which could be applied nationwide.

### 6.4 Transition to wave power generators in Japan

Tamotsu Ikeda described the history of the development of a wave power generator in Japan from commencement to termination. He noted the benefits of the Wells Turbine for wave power generation. In discussion it was noted that no baffles were required to prevent water damage to turbines and the load of AIS and GPS prevent the turbine from over speeding. Annual maintenance of wave generators is required.

### 6.5 Invitation to the 19th IALA Conference 2018

Yong Chan Bae issued an invitation to all participants to attend the 19<sup>th</sup> IALA conference in Incheon, Republic of Korea, from May 27 (Sun) - June 2 (Sat), 2018 with the theme “Successful voyages, sustainable planet - A New Era for Marine Aids to Navigation in a Connected World”. Paper ENG6-6.5 refers.

### 6.6 IALA Conference World Lighthouse Heritage Exhibition

Yong Chan Bae issued an invitation to all participants to provide artefacts for the World Lighthouse Heritage Exhibition to be held in the association with the 19<sup>th</sup> IALA conference in Incheon, Republic of Korea, from 27<sup>th</sup> May to 2<sup>nd</sup> June 2018. The exhibition is open to the public with public lectures throughout. Paper ENG6-6.6 refers.

### 6.7 Incheon Declaration

Kim Jong Hun proposed the Incheon Declaration on historic lighthouse as world heritage sites to recognise historic lighthouses, their equipment and other aids to navigation as world heritage, to recognise it is valuable to conserve such heritage and to work together for promoting the value of such heritage and conserving such heritage in its original form. Paper ENG6-6.7 refers.

## 7. REVIEW OF WORK PROGRAMME AND WG EXPECTATIONS

### 7.1 Work review

The ENG Committee Workplan, was updated. Paper ENG6-11.2.11 refers.

The ENG Work Programme Task Register for 2014-18 was updated. Paper ENG6-11.2.12 refers.

It was proposed to provide the Committee work plan to the Council meeting in Incheon in May 2018 for approval.

A list of proposed topics for the 2018 to 2022 work programme was produced. Paper ENG6-11.2.20 refers.

#### **Action**

*The Secretariat is requested to forward the revised ENG Committee Workplan, ENG6-11.2.11, to ENG7.*

*The Secretariat is requested to forward the revised ENG Work Programme Task Register for 2014-2018, ENG6-11.2.12, to ENG7.*

*The Secretariat is requested to forward paper ENG6-11.2.20, future work programme, to ENG7.*

## **8. ESTABLISH WORKING GROUPS**

### **8.1 Establishing working groups**

Two working groups were established, as outlined below:

Working Group		Working Group Chair	Working Group Vice Chair
WG 1	Visual & Physical AtoN	Malcolm Nicholson	Frank Hermann
WG 2	Technical Knowledge & Sustainability	Adam Hay	Peter Schneider Jorg Unterdeuweide

## **9. WORKING GROUP 1 – VISUAL & PHYSICAL ATON**

### **9.1 Develop guidance on Marine Signalling (Task 1.1.1)**

Refer to Task 1.1.2 & 1.1.3

### **9.2 Develop guidance on the selection of rhythmic characters including 1069 Synchronisation (Task 1.1.2)**

Work concluded on the new Guideline entitled Selection of Rhythmic Characters and Synchronisation of Lights for AtoN taking into account information from E-110 and introducing new sections on the use of non-rotating flashing lights, flash profiles, synchronisation and sequencing. Task complete.

### **9.3 Update / Replace 1038 On Ambient Lights Levels (Task 1.1.3)**

Work concluded on the update/replacement of the Guideline 1038 and included alternative methods for switching AtoN including astronomical clocks, GNSS, AIS, visibility detectors, user demand etc. The present lux levels of ambient light recommended in the Guideline were retained.

### **9.4 Populate the S100 registry for relevant AtoN classes (Task 2.5.1)**

This task was due to commence at ENG6. However, due to the number of input papers and other priorities this task was not started.

### **9.5 Navguide updates (Task 5.1.1)**

A schedule to provide updates to the Navguide has been agreed between ENG and ARM Committees. The Committee provided updates in accordance with the Navguide update schedule and a revised updated plan was produced.

### **9.6 Review of IALA documents (ref ENG1 input paper on document ownership) (Task 5.1.2)**

Refer to Tasks 5.1.3-5.1.13.

### **9.7 Review and Update E200 on Marine Signal Lights (Task 5.1.3)**

This task continued at ENG6 with input papers from the UK and Germany. The series is being revised into four short recommendations on colour, range, measurement and effective intensity and the remainder of the information would be transferred to Guidelines. Recommendations on colour, range and effective intensity are complete, but will be forwarded to ENG7 as working papers with the intention of having all four recommendations complete and approved at the same time. Work progressed on a new Guideline on the calculation of luminous intensity and range with a view to completion at ENG7

#### **Action Item**

*The Secretariat is requested to forward the working papers ENG6-11.2.17, ENG6-11.2.18, ENG6-11.2.19 and ENG6-11.2.21 to ENG7.*

*Alwyn Williams is requested to provide input to ENG7 on E-200-3 Measurement.*

*Frank Hermann, Fernando Romero & Partel Keskkula are requested to work on the guideline intersessionally and submit an input paper to ENG7.*

*Committee members are requested to provide information on meteorological data for their respective regions and any local conditions visibility factor used. E.g. greater than 90%.*

### **9.8 Update E-106 for the use of retro-reflecting material on aids to navigation marks within the IALA Maritime Buoyage System (Task 5.1.4)**

The Committee completed the task taking into account the suggestions from the ARM Committee. A separate Guideline is being developed with the intention to complete at ENG7. The Guideline will be worked on intersessionally and submitted to ENG7.

#### **Action Item**

*The Secretariat is requested to forward ENG6-11.1.22, Draft Recommendation E-106 Retroreflecting Material, to Council for approval.*

*Jorgen Royal Petersen, Sami Lasma and Sigge Gustafsson are requested to work intersessionally on the Guideline on Retroreflectors and submit an input paper to ENG7.*

### **9.9 Review and Update Recommendation E-108 Ed 2 for the Surface Colours used as visual signals on aids to navigation (Task 5.1.5)**

This task is due to commence at ENG6. However, due to the amount of input papers and priority of work this task was not started. The WG discussed the way forward and decided that there was no evidence to make any changes to the boundaries and that Frank Hermann would convert the present recommendation to a similar format of E200-1. The remainder of the recommendation would be moved to a new or existing Guideline.

#### **Action Item**

*Frank Hermann is requested to submit a revised E-108 (similar to the format of E200-1) to ENG7.*

### **9.10 Review of IALA Recommendation E-110 for the Rhythmic Characters of Lights on Aids to Navigation (2012) (Task 5.1.6)**

In light of the new Guideline on 'The Selection of Rhythmic Characters' (see Task 1.1.2) work has begun on updating Recommendation E-110. This work was completed and the Draft Recommendation E-110 for the Rhythmic Characters of Lights on Aids to Navigation is ready to send to Council for approval. Task complete.

### **9.11 Update Recommendation E-111 for port traffic signals (Task 5.1.7)**

This task was due to commence at ENG4. However, due to the amount and quality of input papers at ENG5/ENG6 work on this task did not begin. A working paper has been received from South Africa and will be considered when dealing with this update. The working group decided that this task would not be completed during this work programme and suggests that it is held over to the next four year work period.

#### *Action Item*

*The Secretariat is requested to hold the input paper ENG6-9.5 indefinitely until this task is started.*

*ENG Committee Members are requested to submit input papers in support of the revision of Recommendation E-111 on Port Traffic Signals for the next work programme.*

#### **9.12 Update Recommendation E-112 for Leading Lights and Guideline 1023 for the design of leading lights (Task 5.1.8)**

Pending the workshop on sustainable light and power for the next generation, Task 5.1.9 has been delayed to nearer the end of the work program and accordingly the task commenced at ENG3. Seven input papers were received at ENG4 were reviewed and subsequently amalgamated into a single working paper. It was decided that the recommendation is more guidance and that a single guideline would be sufficient for IALA members.

Work continued on this task as further input papers were received and it was identified that the Excel spread sheet for designing leading lines provided by IALA requires updating.

Due to the number of input papers and other priorities work on this task did not progress and the task will not be finished during the 2014 - 2018 work programme.

#### *Action Item*

*Simon Millyard and David Jeffkins are requested to note the request to move the task of updating Guideline 1023 and Recommendation E-112 to the next work period programme.*

*The Secretariat is requested to provide the leading lines calculation spreadsheet on the calculations section of the IALA website with a link to Guideline 1023 and Recommendation E-112.*

#### **9.13 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)**

Pending completion of the workshop on Sustainable Light and Power for The Next Generation and to allow for the most up to date information to be included in the update, this task was postponed to ENG6. A re-formatted version of Guideline 1043 was merged with Guideline 1048 at the workshop on Sustainable Light and Power for the Next Generation. However, it was agreed that 1049 should remain a standalone document. However, due to the number of input papers and other priorities work did not continue on this task at ENG6.

#### *Action Item*

*Colin Day and Link Powell are requested to work on draft Guideline 1043, ENG6-9.6, and draft Guideline 1049, ENG6-9.25 intersessionally and provide an input paper to ENG7.*

#### **9.14 Update 1041 on Sector Lights (Task 5.1.10)**

Task complete

#### **9.15 Update 1061 Illumination of Structures (Task 5.1.11)**

The revision of this Guideline has not progressed as envisaged. It is proposed to move this task to the next ENG work programme.

#### *Action Item*

*Simon Millyard and David Jeffkins are requested to note the proposal to move the task of updating Guideline 1041 to the next work programme.*

#### **9.16 Update 1065 on Aids to Navigation Signal Light Beam Vertical Divergence (Task 5.1.12)**

A reformatted version of this Guideline was received as an input paper which was reviewed and amended. Due to the number of input papers and other priorities no progress was made on this task.

#### Action Item

*The Secretariat is requested to forward working paper ENG6-9.7 to ENG7.*

#### **9.17 Review and Update of Guideline 1073 on Conspicuity of AtoN at Night (Task 5.1.13)**

A reformatted Guideline 1073 was developed at the workshop on Sustainable Light and Power for the next Generation in Koblenz with a view to completion at ENG6. However, due to the number of input papers and other priorities work did not continue on this task.

#### Action Item

*The Secretariat is requested to forward input paper ENG6-9.26 to the ENG7.*

#### **9.18 Review and update 1069 on synchronisation of lights (Task 5.1.14)**

The majority of the relevant information of Guideline 1069 has been captured in the new Guideline on the selection of rhythmic characters and Guideline 1069 has been revoked. Some relative examples in the annex to this document have been uploaded to the IALA Wiki. Task complete.

#### **9.19 Identify current documents as potential Standards, Recommendations, Guidelines & Manuals (Task 5.2.1)**

This task has changed in lieu of IALA Strategy.

#### **9.20 Presentation to ENG Committee on new developments in AtoN & related topics (Task 5.3.1)**

#### Action Item

Members are requested to input presentations to future ENG meeting on topics of interest to the Committee.

### **10. WORKING GROUP 2 – TECHNICAL KNOWLEDGE & SUSTAINABILITY**

#### **10.1 Workshop on Sustainable Lights and Power Systems – IALABATT/IALALITE (Task 1.5.2)**

The workshop on Sustainable Light & Power for the Next Generation (IALABATT/IALALITE) was successfully completed the week preceding ENG6. A number of the work items for both WG1 and WG2 were further progressed. The Committee acknowledged the success of the workshop and the effort of all contributors and presenters.

All presentations were made available to ENG6 participants.

#### **10.2 Develop further guidance on Plastic Buoys, Systems & Sensors (Task Number 2.1.1)**

Work continued with further review and development of Guideline 1006 on Plastic Buoys. The draft Guideline will be forwarded to ENG7 with a view to completing it at that session.

#### Action Item

*The IALA Secretariat is requested to forward working papers ENG6-11.2.3 and ENG6-11.2.4 to ENG7.*

*Committee participants are requested to provide any relevant information from their respective regions regarding the use of plastic buoys in hot climate and high UV exposure environments, power supply for buoys and remote control technologies to ENG7.*

#### **10.3 Engineering guidance on the implementation of e-navigation systems. (Task Number 2.1.2)**

There was no additional input to ENG6 relating to this work task. It was agreed that e-navigation was still in development and further progress was needed before ENG could provide specific written guidance on its practical aspects. Participants were encouraged to identify any work or information relevant to this task and provide as input to ENG7.

#### *Action Item*

*Committee participants are requested to provide any relevant information from their respective regions regarding trials or work on integration of e-navigation systems with conventional AtoN equipment and systems to ENG7.*

#### **10.4 Develop guidance on Sustainable AtoN design & Maintenance. (Task Number 2.2.1)**

Guideline 1036 was reviewed and updated. Additional information related to climate change and global warming was added, to provide the reader with reference to a source of scientific data that could be used to help deal with this issue in their respective organisation. The document was reviewed and it was agreed that the document was complete and ready for Council approval.

It was identified that a high level document on environmental management was required in order to fit the new IALA document structure. As such a Recommendation on Environmental Management was drafted for submission to Council. This Recommendation will reference Guideline 1036.

#### *Action Item*

*The IALA Secretariat is requested to forward output paper ENG6-11.1.1 and ENG6-11.1.19 to Council for approval.*

#### **10.5 Develop guidance on the commissioning of AtoN equipment and systems and engineering audits. (Task Number 2.2.2)**

Development of the draft Guideline on the commissioning of AtoN equipment and systems and Engineering audits continued at ENG6. A final draft of the Guideline will be forwarded to ENG7, with a view to completing it at that session. Committee participants are asked to review and comment intersessionally on the final draft.

#### *Action Item*

*The IALA Secretariat is requested to forward working paper ENG6-11.2.13 to ENG7.*

*Participants are requested to review working paper ENG6-11.2.13 and provide feedback to ENG7.*

#### **10.6 Develop guidance on AtoN design & maintenance for hot climates (Task Number 2.3.1)**

Work on the draft Guideline on Providing AtoN Services in Extremely Hot and Humid Climates was continued at ENG6 and will be forwarded to ENG7 with a view to completing it at that session.

A liaison note was received from the ENAV Committee, in response to a liaison note sent from ENG5, relating to VHF propagation in hot and humid climates. The ENAV committee noted the information and commented that the VDES system should be able to compensate for extreme conditions due to a number of flexibilities available with the technology. The ENAV Committee requested that the ENG Committee continue to supply additional extreme data as it becomes available as this could be used in the design of VDES.

#### *Action Item*

*The IALA Secretariat is requested to forward working paper ENG6-11.2.5 to ENG7.*

#### **10.7 Review and update guidance on safety of personnel (Task 2.4.1)**

The draft Guideline on Safety of Personnel was reviewed.

It was agreed that content was substantially complete and still relevant, but in order to allow final input from working group participants, the Guideline will be forwarded to ENG7, with a view to completing it at that session. Committee participants were asked to review intersessionally and comment.

#### *Action Item*

*The IALA Secretariat is requested to forward working paper ENG6-11.2.1 to ENG7.*



Committee participants are asked to review ENG6-11.2.1 intersessionally and provide comments to ENG7.

#### **10.8 Support the WWA in updating Recommendations and Guidelines on standards for training and certification of AtoN personnel (Task 3.1.1)**

No proposals for updated Academy Recommendations or Guidelines were received as input for ENG6.

#### **10.9 Support the WWA in updating model courses on standards for training and certification of AtoN personnel as training courses are undertaken (Task 3.2.1)**

The Committee noted input paper ENG6-10.19, detailing the model courses requiring review or clarification. As a result of that request, ENG6-11.1.2 (L2 Model Course on Shore Marks), ENG6-11.1.3 (L2 Model Course on Surface Preparation and Coatings), ENG6-11.1.4 (L2 Model Course on Wind Generators), ENG6-11.1.5 (L2 Model Course on Mains AC Power Systems, Petrol and Diesel Generators) and ENG-11.1.6 (L2 Model Course on Lightning Protection) were reviewed and completed for submission to Council for approval.

The work group also noted that a number of queries were raised during formatting. In response to those queries, ENG6-11.1.7 (L2 Model Course on Remote Monitoring of AtoN), ENG6-11.1.8 (L2 Model Course on Remote Monitoring of AtoN), ENG6-11.1.9 (L2 Model Course on Introduction to AtoN Buoyage), ENG6-11.1.10 (L2 Model Course Overview) and ENG6-11.1.11 (L2 Model Course E-141 AtoN Manage Training) were reviewed and responses to queries were provided for Mike Hadley.

Under the Academy distance learning programme, five participants passed modules of the level 1 AtoN managers' course during ENG6. A further four participants studying will attend the module 3 training at IALA HQ in April 2017.

Whilst reviewing the text of various WWA Level 1 and 2 course modules, some issues were noted relating to the published Model Courses and these were referred to the Secretariat.

#### **Actions**

*The IALA Secretariat is requested to forward output papers ENG6-11.1.2, ENG6-11.1.3, ENG6-11.1.4, ENG6-11.1.5 and ENG6-11.1.6 to the IALA Council for approval.*

*The IALA Secretariat is requested to forward output papers ENG6-11.1.7, ENG6-11.1.8, ENG6-11.1.9, ENG6-11.1.10 and ENG6-11.1.11 to Mike Hadley for finalisation.*

*The Secretariat is requested to note that two entries of course L2 3.1-3 exist, they both seem the same but with different titles; to avoid confusion one should be removed. One is entitled Introduction to Marine Signal Lanterns, the other Introduction to Marine Lanterns.*

*The Secretariat is requested to note that there are two courses with the same reference L2.1.14. One is Power systems on Buoys, the other an Introduction to Shore Marks. The Power systems one is better placed in Module 2 but needs a new element number.*

*The Secretariat is requested to note that Model Course L2.2.2 Primary & Secondary Battery Maintenance is shown as L2.2 on the web page and "Module 2 Element 2.1 (L2.2.2)" on the front page of the document. It is assumed that it should be L2.2.2 on all references.*

*The Secretariat is requested to correct front page colour errors in Model Courses published in June 2017.*

*The Secretariat is requested to complete formatting and publish Model Courses approved in December 2017.*

#### **10.10 Develop guidance on the use of heritage lighthouses for modern AtoN equipment & systems (Task Number 4.1.1)**

Work on the draft Guideline on the Use of Heritage Lighthouses for Modern Aton Equipment continued at ENG6 and will be forwarded to ENG7 for further work.

Some intersessional assistance will be sought from Committee participants to further develop the Guideline before ENG7.



#### *Action Item*

*The IALA Secretariat is requested to forward working paper ENG6-11.2.2 to ENG7.*

*Committee participants are requested to provide input to ENG7 on any relevant experience with the use of modern AtoN equipment and systems in heritage lighthouses.*

### **10.11 Develop guidance on the maintenance of AtoN structures (Task Number 4.1.2)**

Work on the draft Guideline on Maintenance of AtoN Structures was continued at ENG6 and will be forwarded to ENG7 for further work.

#### *Action Item*

*The IALA Secretariat is requested to forward working paper ENG6-11.2.4 to ENG7.*

*Committee Members are requested to review working paper ENG6-11.2.4 on Maintenance of Aton Structures and provide feedback or information on maintenance systems or processes in their respective organisations to ENG7.*

### **10.12 Navguide updates (Task 5.1.1)**

Review of the Navguide was further progressed. The review was guided predominantly by the Navguide Update Plan. It was agreed that some sections would require intersessional work in order to be completed by ENG7.

The Navguide Update Plan was updated to reflect progress made at ENG6 and sent to the ARM Committee.

#### *Action Item*

*The IALA Secretariat is requested to forward Liaison Note ENG6-11.1.20 and ENG6-11.1.20.1 to the ARM Committee.*

*The IALA Secretariat is requested to forward Working Paper ENG6-11.1.20.1 to ENG7.*

*Members are requested to submit updated photos and illustrations for the Navguide to ENG7.*

*David Jeffkins is requested to update the on-line Navguide as agreed.*

*The Secretariat is requested to retain a page on the File Share for long term retention of AtoN photos.*

### **10.13 Review of IALA documents (ref ENG1 input paper on document ownership) (Task 5.1.2)**

Review of Guideline 1067 was progressed at the workshop on Sustainable Light and Power for the Next Generation (IALABATT / IALALITE) workshop, held in Koblenz, Germany during the week preceding ENG6. That work was continued at ENG6. The guideline was forwarded to ENG7, with a view to completing it at that session.

The review of Guideline 1039, which continued at the IALABATT / IALALITE workshop, was completed at ENG6. The guideline will be forwarded to ENG7 to allow some further intersessional review. Review and development of the associated solar sizing tool was also completed and will be forwarded to ENG7 to allow intersessional testing and comment. Some suggested text for use in the link on the IALA website was provided.

Guideline 1006 on Plastic Buoys was reviewed in conjunction with Task 2.1.1, on development of further guidance for plastic buoys, systems and sensors. Further intersessional work is planned and revisions will be submitted to ENG7.

#### *Action Item*

*The IALA Secretariat is requested to forward Working Paper ENG6-11.2.3, ENG6-11.2.4, ENG6-11.2.14, ENG6-11.2.16, ENG6-11.2.15, ENG6-11.2.7, ENG6-11.2.8, ENG6-11.2.9 and Working Paper ENG6-11.2.10 to ENG7.*

## **10.14 Identify current documents as potential Standards, Recommendations, Guidelines & Manuals (Task 5.2.1)**

This work was progressed, with a number of Standards reviewed and new Recommendations and Guidelines identified and drafted.

The Committee was requested to review and comment on the seven draft IALA Standards (Input papers ENG6-4.4.2 to ENG6-4.4.8). The Committee reviewed the draft Standards and their associated Recommendations and suggested some minor changes for consideration by the IALA Secretariat and Policy Advisory Panel. Output papers ENG6-11.1.12 to ENG6-11.1.18 refer.

Four revised Recommendations on Marine Signal Lights referenced in IALA Standard 1020 are nearing completion and will be finalised at ENG7.

A Recommendation for Environmental Management was drafted and will be sent to Council for approval.

A Recommendation for Conserving the Built Heritage of Lighthouses and other Aids to Navigation was drafted and will be sent to Council for approval.

### **Action**

*The Secretariat is requested to send Output Paper ENG6-11.1.19 to Council for approval.*

*The Secretariat is requested to send Output Paper ENG6-11.1.21 to Council for approval.*

*The Secretariat is requested to note the comments in papers ENG6-11.1.12 to ENG6-11.1.18.*

## **10.15 Heritage Forum**

The Committee focused on activities required to establish the Lighthouse Heritage Exhibition Committee and the Incheon Declaration Drafting Committee, in support of promoting Heritage at the 2018 IALA Conference.

A presentation was provided by the Lighthouse Heritage Exhibition Committee, covering the aims and outline of the exhibition space and the object-oriented interpretation/display requirements. The January 2018 deadline for identifying all required artefacts intended for display was noted. The events programme for the exhibition hall's open-plan stage was discussed and it was agreed that events should be limited to days 2, 3 and 4 (1400-1600hrs each day). Although specific events were not discussed, it was discussed that such events could be heritage/history presentations, panel discussions and similar.

The Committee discussed methods of encouraging IALA members to send artefacts to Korea for the exhibition.

The Committee recommended that an Interpretation Plan might help focus exhibition design efforts but it was suggested that a purely object-oriented display did not require an Interpretation Plan so much as it required a 'wishlist' of artefacts to be drawn up by the host country. This will be finalized and forwarded as input to ENG7. The Committee looked at examples of lighthouse visitor centre virtual tours and education packs that might inspire the efforts of the host country.

The Committee also suggested a commemorative exhibition catalogue or information booklet, to provide additional background and create supporting educational material.

The Incheon Declaration Drafting Committee reviewed and revised the initial draft of the Incheon Declaration. A second draft, ENG6-11.1.24, will be sent by Mr Kim to LAP, PAP, ISC for the 2018 Conference and ARM Committees for review and comment to Mr Yong-Chan Bae.

The Heritage Forum Group continued to develop a strategy which determines the focus of the group, the structure of its work items and the way it will continue to integrate with the work of IALA through the ENG Committee.

The group also considered the request by the Vice Dean of the IALA WWA to run the IALA WWA.L1.5 course (Historic Lighthouse Projects), with caveats regarding the suitability of the existing Conservation Manual. It was felt that this could be agreed and would be considered and developed further at ENG7.

### **Action**

*Committee participants are encouraged to consider sending heritage AtoN artefacts for the 2018 IALA Conference and to contact members of the Heritage Forum for further details.*

*The Secretariat is requested to forward the draft Incheon declaration ENG6-11.1.24 to LAP, PAP, ISC for the 2018 Conference and ARM Committees for review and comment to Mr Yong-Chan Bae.*

*Ministry of Oceans and Fisheries, Republic of Korea [MOF] is requested to consider whether an Interpretation Plan is necessary.*

*The MOF is requested to consider an exhibition catalogue/education pack for the Conference Lighthouse Heritage Exhibition.*

*The MOF is requested to arrange the opening ceremony for the Conference Lighthouse Heritage Exhibition.*

*The MOF is requested to design all interpretation for the Conference Lighthouse Heritage Exhibition.*

*The MOF is requested to draw up an artefact wish list for the Conference Lighthouse Heritage Exhibition.*

*The MOF is requested to seek clarification on shipping/insurance costs for artefacts.*

*The MOF is requested to arrange events programme for the Conference Lighthouse Heritage Exhibition.*

*WG2 TG4 is requested to arrange a conference call/video call early-mid October, shortly before ENG7.*

### **10.16 Reformatting of IALA Documentation**

The Committee received a number of reformatted IALA WWA documents from Mike Hadley, with some minor queries on content that were noted during reformatting. The Committee reviewed and updated the documents and returned them for finalization.

### **Action**

*The IALA Secretariat is requested to forward output papers ENG6-11.1.7, ENG6-11.1.8, ENG6-11.1.9, ENG6-11.1.10 and ENG6-11.1.11 to Mike Hadley for finalization.*

## **11. REVIEW OF OUTPUT AND WORKING PAPERS**

The Committee produced 25 output documents and 21 working papers including 5 Academy model courses. Output papers were reviewed and their disposition agreed as indicated in ANNEX E.

The following question was asked of all attendees:

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

### **Action**

*The Secretariat is requested to contact Tony Taylor from Pharos Marine re pending patents announced at the workshop on Sustainable Light and Power for the Next Generation in Koblenz.*

## **12. ANY OTHER BUSINESS**

Participants enjoyed a number of social events. On Tuesday evening, participants savoured other cultures through shared typical food and drink from their home countries. On Wednesday evening the Committee dinner was well attended in the Café Joles. On Thursday a hard fought football game left combatants exhausted but content.

### 13. REVIEW OF SESSION REPORT

The report of the meeting (ENG6-13.1) was considered. Committee Participants were requested to advise any corrections / amendments within one week, following which the final version will be issued via the IALA web site.

#### *Action item*

*The Secretariat is requested to forward the ENG6 Committee report (ENG6-13.1) to Council to note.*

### 14. DATE AND VENUE OF NEXT MEETING

It is expected that the 7<sup>th</sup> session of the ENG Committee (ENG7) will be from 9<sup>th</sup> to 13<sup>st</sup> October 2017 at IALA HQ.

The Committee was invited to use the facilities at IALA for intersessional meetings to progress essential work if required, bearing in mind that there are no Committee sessions between October 2017 and October 2018.

### 15. CLOSING OF THE MEETING

The Deputy Secretary-General thanked the ENG participants and leaders for their hard work and achievements. He noted the good progress at the workshop in Koblenz and that the workshop outputs had been further developed at ENG6. Noting the good progress on preparation and revision of IALA documents, he observed that the IALA documents are used world-wide, showing the importance of the Committee work. The Council meets in June while the LAP and the PAP meet in early April 2017. The first e-Navigation Underway Asia-Pacific conference is in planning with a number of presentations from ENAV participants expected. A pre-diplomatic conference to progress the transition of IALA to IGO status is planned.

He concluded by saying that all were invited to ENG7, wished everyone a safe journey home and hoped to see everyone at the next meeting.

### 16. LIST OF ANNEXES

- 1     Agenda  
      A copy of the agenda is at ANNEX A.
- 2     Participants  
      A list of participants is at ANNEX B.
- 3     Working Group Participants  
      A list of working group participants is at ANNEX C.
- 4     Input Papers  
      A list of input papers is at ANNEX D.
- 5     Output and Working papers  
      A list of output and working papers is at ANNEX E.
- 6     Work programme progress  
      A summary of progress in completing the work programme and progress with deliverables is at ANNEX F.
- 7     Action Items  
      A list of action items is at ANNEX G.

## 6<sup>th</sup> Meeting of the AtoN Engineering and Sustainability Committee (ENG6)

The 6<sup>th</sup> meeting of the AtoN Engineering and Sustainability Committee (ENG6) will be held from 27 – 31 March, 2017 at IALA, St Germain en Laye, France.

The opening plenary will commence at 1300 on Monday 27 March and the closing plenary will end at approximately 1300 on Friday, 31 March.

Committee Chair, Vice-Chair and Working Group Chairpersons are requested to meet at 0900 on Monday, 27 March 2017.

### AGENDA

1. Opening
  - 1.1. Approval of the agenda
  - 1.2. Welcome address from the Secretary-General/Deputy Secretary-General
  - 1.3. Administration and safety briefing
  - 1.4. Introductions and apologies
  - 1.5. Programme for the week
2. Review of action items from ENG5
3. Review of input papers
  - 3.1. Input papers
  - 3.2. Identify input papers suitable for uploading to the IALA Wiki
4. Reports from other bodies
  - 4.1. Report on 63<sup>rd</sup> Session of the IALA Council 2016-12
  - 4.2. Report of the 32<sup>nd</sup> Session of the IALA Policy Advisory Panel 2016-10
  - 4.3. Report IALA Workshop on Sustainable Light & Power for the Next Generation, Koblenz
  - 4.4. Draft IALA Standards
  - 4.5. Report IALA Workshop on AIS AtoN developments, Seoul, 19 - 20 October 2016
  - 4.6. Report e-Navigation Underway International 2017 final
  - 4.7. Position on the Development of AtoN Services
5. Reports from Rapporteurs
 

5.1.	Developments in Renewable Energy Sources	Peter Dobson
5.2.	Developments in Battery Technology	Jonas Lindberg
5.3.	Developments in New Light Sources	Malcolm Nicholson / Alwyn Williams
5.4.	CIE-IALA Liaison	Alwyn Williams
5.5.	Developments in AtoN Simulation Systems	Jin-Min Yeo
5.6.	Developments in remote control and monitoring	Peter Schneider
5.7.	IALA Dictionary	David Jeffkins
5.8.	IALA Bulletin liaison	David Jeffkins
6. Presentations (15 minutes duration)

- |      |   |                 |
|------|---|-----------------|
| 6.1. | Brief on WWA  | Stephen Bennett |
| 6.2. | Developments in NT solid state radar systems and racons               | Philip Wilson   |
| 6.3. | Mini VTS system in Portugal   | Manuel Santos   |
| 6.4. | Transition to wave power generators in Japan                          | Tamotsu Ikeda   |
| 6.5. | Invitation to the 19th IALA Conference 2018                           | Bae Yong Chan   |
| 6.6. | IALA 19 <sup>th</sup> Conference World Lighthouse Heritage Exhibition | Bae Yong Chan   |
| 6.7. | IALA 19 <sup>th</sup> Conference Incheon Declaration                  | Kim Jong Hun    |
| 7.   | Review of Work Programme and WG expectations                          |                 |
| 8.   | Establish Working Groups  |                 |
| 9.   | WG 1 - Visual & Physical AtoN   |                 |
| 10.  | WG 2 - Knowledge & Sustainability                                     |                 |
| 11.  | Review of output and working papers                                   |                 |
| 12.  | Any other business  |                 |
| 13.  | Review of session report  |                 |
| 14.  | Date and venue of next meeting  |                 |
| 15.  | Close of meeting  |                 |

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## Apologies

Apologies were received from the following.

Name	Organisation	Country
Michel Cousquer	CEREMA	France
J.Bader Al Mutawa	MENAS	Bahrain
Greg Hansen	AMSA	Australia
Sigge Gustafsson	Sjofartsverket	Sweden
Andrew Mulhern	Northern Lighthouse Board	UK

## Working Group 1

## Visual &amp; Physical AtoN

	Members	Organisation / Country
1	Malcolm Nicholson (Chair)	Sealite, Australia
2	Frank Hermann (Vice Chair)	German Federal Waterways & Shipping Administration, Germany
3	Colin Day	Commissioners of Irish Lights, Ireland
4	Fernando Romero	Meditteraneo Senales Maritimus, Spain
5	Partel Keskküla	Estonian Maritime Administration, Estonia
6	Manuel Santos	Portuguese Lighthouse Authority, Portugal
7	Jorgen Royal Petersen	Danish Maritime Authority, Denmark
8	Dong Gen Luo	China MSA, China
9	Sixiong Hong	China MSA, China
10	Juseop Han	Korea Association of Aids to Navigation, Republic of Korea
11	Sami Lasma	Finnish Transport Agency, Finland
12	Alwyn Williams	General Lighthouse Authorities, R&RNAV, UK
13	Yves-Marie Blanchard	CEREMA, France

## Working Group 2

## Technical Knowledge &amp; Sustainability

	Name	Organisation / Country
1	Adam Hay (Chair)	Nawae Construction / Papua New Guinea
2	Jörg Unterdeweide (Vice Chair)	German Federal Waterways & Shipping Administration/ Germany
3	Peter Schneider (Vice Chair)	German Federal Waterways & Shipping Administration/ Germany
4	Alan Cran	Northern Lighthouse Board, Scotland
5	Jordan Lane-Beveridge	Canadian Coast Guard, Canada
6	Leif Arne Larsen	Norwegian Coastal Administration, Norway
7	Shaheen Mirza	MENAS, Bahrain
8	Mariano Luis Marpegan	Hidrovia S.A., Argentina
9	Ronan Autret	CEREMA, France
10	Alfredo Dominguez	Tideland Signal Corp, USA
11	Fabrice B. Goma	CNIDM of Congo B/Z, Congo
12	Ho-Jin Lee	Ministry of Oceans & Fisheries, Republic of Korea
13	Junki Bae	Korea Association of Aids to Navigation, Republic of Korea

	Name	Organisation / Country
14	Joel Tourbot	Inter-regional Maritime Directorate (DIRM), France
15	Peter Dobson	Trinity House Lighthouse Service, UK
16	Marco Krings	German Federal Waterways & Shipping Administration, Germany
17	Nicolos Fady	CEREMA, France
18	Jose Carlos Diez	Puerto del Estado, Spain
19	Seppo Virtanen	SeaHow, Finland
20	Vincent Roget	GISMAN, France
21	Philippe Renaudin	CEREMA, France
22	Samir Benouda	Mobilis, France
23	Marine Saccoman	Mobilis, France
24	Neil Jones	Trinity House, UK
25	David Cassidy	Go Deep International Inc., Canada
26	Alimuddin Amirudin	Marine Department, Malaysia
27	Mahmoud Mboreha Mohamed	Comoros Port Authority, Comoros
28	Si Xiong Hong	Maritime Safety Administration, China
29	Saleh Hoshan	GCC

## ANNEX D LIST OF INPUT PAPERS

All papers were posted to the [Committee website](#)

Number	Input Paper Title	Source	Presented by / WG
ENG6- 1.1	Draft Agenda 20170322	IALA Secretariat	Simon Millyard
ENG6- 1.5	Programme for the week 20170109	IALA Secretariat	Simon Millyard
ENG6- 2.1	Action Items from ENG5	ENG5	Seamus Doyle
ENG6- 3.1	Input paper Committee template February 2017	IALA Secretariat	Simon Millyard
ENG6- 4.1	Report of the 63rd session of the IALA Council	IALA Secretariat	Seamus Doyle
ENG6- 4.2	Report of the 32nd Session of the IALA Policy Advisory Panel 2016-10	IALA Secretariat	Simon Millyard
ENG6- 4.3	IALA Workshop on Sustainable Light & Power for the Next Generation Report final	Workshop on Sustainable Light & Power	Simon Millyard
ENG6- 4.4.1	Draft IALA Standards	IALA Secretariat	Michael Card
ENG6- 4.4.2	(C63-8.4.1.1) IALA Standard 1010 AtoN Planning & Service Requirements draft	IALA Secretariat	WG1, WG2
ENG6- 4.4.3	(C63-8.4.1.2) IALA Standard 1020 AtoN Design and Delivery draft	IALA Secretariat	WG1, WG2
ENG6- 4.4.4	(C63-8.4.1.3) IALA Standard 1030 Radionavigation Services draft	IALA Secretariat	WG1, WG2
ENG6- 4.4.5	(C63-8.4.1.4) IALA Standard 1040 Vessel Traffic Services draft	IALA Secretariat	WG1, WG2
ENG6- 4.4.6	(C63-8.4.1.5) IALA Standard 1050 Training and Certification draft	IALA Secretariat	WG1, WG2
ENG6- 4.4.7	(C63-8.4.1.6) IALA Standard 1060 Digital Communication Technologies draft.	IALA Secretariat	WG1, WG2
ENG6- 4.4.8	(C63-8.4.1.7) IALA Standard 1070 Information Services draft	IALA Secretariat	WG1, WG2
ENG6- 4.5	Report IALA Workshop on AIS AtoN developments - Seoul - 19_21 Oct 2016	IALA Workshop on AIS AtoN developments, Seoul	Simon Millyard
ENG6- 4.6	Report e-Navigation Underway International 2017 final	ENUW International 2017	Omar Frits Eriksson
ENG6- 4.7	(PAP33-12.1) Position on the Development of AtoN Services	IALA Secretariat	Michael Card
ENG6- 5.6	Developments in remote control and monitoring	Peter Schneider	Peter Schneider
ENG6- 5.6.1	Remote monitoring 170309 where the watt went	Peter Schneider	Peter Schneider
ENG6- 6.1	WWA ENG Committee brief	WWA	Gerardine Delanoye
ENG6- 6.2	Presentation PRE-5418 Slipstream Engineering Design Advances in RACON [P030-0]V1.00	Philip Wilson	Philip Wilson
ENG6- 6.3	Presentation Mini VTS system in Portugal - COSTA SEGURA.pptx	Manuel Santos	Manuel Santos

Number	Input Paper Title	Source	Presented by / WG
ENG6- 6.5	Presentation Invitation of the 19th IALA Conference 2018	Yong Chan Bae	Yong Chan Bae
ENG6- 6.6	Presentation IALA 19th Conference World Lighthouse Heritage Exhibition	Yong Chan Bae	Yong Chan Bae
ENG6- 6.7	IALA 19th Conference Incheon Declaration	Jong Hun Kim	Jong Hun Kim
ENG6- 7.1	(ENG5-11.2.1) ENG Committee Workplan 2014-18 Updated at ENG5	ENG5	Simon Millyard
ENG6- 7.2	(ENG5-11.2.2) Update Work Plan Task Register at ENG5	ENG5	Simon Millyard
ENG6- 9.1	(ENG4-11.2.22) Draft Recommendation on Marine Signal Lights Colours <b>Update ENG6-9.12</b>	ENG4	WG1
ENG6- 9.2	(ENG4-11.2.23) Draft Recommendation on Luminous Range <b>Update ENG6-9.13</b>	ENG4	WG1
ENG6- 9.3	(ENG4-11.2.24) Frame for Draft Guideline on Marine Signal Lights.	ENG4	WG1
ENG6- 9.4	(ENG5-11.1.21) Draft Recommendation E-106. Retroreflecting materials post plenary	ENG5	WG1
ENG6- 9.5	(ENG5-9.15) Update E111 for Port Traffic Signals South Africa JamesC	ENG5	WG1
ENG6- 9.6	(ENG5-11.2.14) Guideline 1043 Ed.1.2 Light Sources used in Visual AtoN December 2011 rev1	ENG5	WG1
ENG6- 9.7	(ENG5-11.2.15) IALA Guideline 1065 Ed.2 Vertical Divergence December 2013 rev3	ENG5	WG1
ENG6- 9.8	(ARM5-12.1.5) Liaison to ENAV-VTS-ENG on Mobile AtoN	ARM5	WG1
ENG6- 9.8.1	(ARM5-12.2.7) WG1 IALA Recommendation MAtoN ARM 5_v2	ARM5	WG1
ENG6- 9.8.2	(ARM5-12.2.8) WG1 IALA Guideline MAtoN ARM 5 v2	ARM5	WG1
ENG6- 9.9	(ARM5-12.1.8) Liaison to all committees - reminder on the NAVGUIDE	ARM5	WG1 / WG2
ENG6- 9.10	(ARM5-12.2.9) WG2 Navguide 2015 tracking table	ARM5	WG1 / WG2
ENG6- 9.11	(ARM5-12.1.13) Liaison Note to ENG on updates to Draft Recommendation E-106. Retroreflecting materials	ARM5	WG1
ENG6- 9.11.1	(ARM5-12.1.14) Draft Recommendation E-106 Retroreflecting materials post plenary	ARM5	WG1
ENG6- 9.12	Draft Recommendation Marine Signal Lights Colours 20170303	Frank Hermann	WG1
ENG6- 9.13	Draft Recommendation Marine Signal Lights Luminous Range 20170303	Frank Hermann	WG1
ENG6- 9.14	Draft Guideline On Intensity Calculations 20170302	Frank Hermann	WG1
ENG6- 9.15	Cover Note Input paper for Draft IALA Guideline on Application of Retroreflective Material on AtoN	Jørgen Royal Petersen	WG1
ENG6- 9.16	Draft IALA Guideline on Application of Retroreflecting Materials on AtoN 20170309 JRP	Jørgen Royal Petersen	WG1
ENG6- 9.17	Questionnaire on use of Retroreflective Material for AtoN 20170209	Jørgen Royal Petersen	WG1
ENG6- 9.18	Current State of Synchronisation of Lights in Korea	Ju-Seop Han	WG1



Number	Input Paper Title	Source	Presented by / WG
	Ver2		
ENG6- 9.19	Quality Certification according to enactment of the Korean Industrial Standards for Lanterns Ver2	Ju-Seop Han	WG1
ENG6- 9.20	IALA Guideline 1023 Ed.1.1 Design of Leading Lines	Pärtel Keskküla	WG1
ENG6- 9.21	Comparison of calculation methods for daymark sizes	Pärtel Keskküla	WG1
ENG6- 9.22	IALA Leading line calculator Ver 2.02	Pärtel Keskküla	WG1
ENG6- 9.23	IALA NAVGUIDE Updates and Proposals	Alwyn Williams	WG1
ENG6- 9.23.1	Navguide_ Chapter 3 - Aids to navigation	Alwyn Williams	WG1
ENG6- 9.24	(SLP1-15.1) Draft Guideline 1043 Ed.1.2 Light Sources used in Visual AtoN December 2011 rev1 Koblenz	Workshop on Sustainable Light & Power	WG1
ENG6- 9.25	(SLP1-15.2) Draft IALA Guideline 1049 Ed.2 Modern Light Sources in Traditional Optics December 2007 rev1 Koblenz.	Workshop on Sustainable Light & Power	WG1
ENG6- 9.26	(SLP1-15.3) Draft IALA Guideline 1073 Ed.1 Conspicuity of AtoN Lights at Night June 2011 rev2 Koblenz	Workshop on Sustainable Light & Power	WG1
ENG6- 9.27	(ENG5-9.17) E-200-3 - IALA Recommendation E200-3 Proposal	ENG5	WG1
ENG6- 9.28	(ENG5-9.18.1) E-200-4 - Effective Intensity Cover Note	ENG5	WG1
ENG6- 9.29	(ENG5-9.18.2) E-200-4 - Recommendation E-200-4 draft	ENG5	WG1
ENG6- 9.30	(ENG5-9.18.3) E-200-4 - IALA Guideline xxxx - Determination and Calculation of Effective Intensity draft	ENG5	WG1
ENG6- 10.1	(ENG5-10.2) IALA Guideline 1066 Ed.1.1 The Design of Floating Aid to Navigation Moorings Jun2010 rev3	Mike Hadley	WG2
ENG6- 10.2	ENG6-10.2 (ENG5-10) IALA Guideline 1098 Ed.1 on the Application of AIS AtoN on Buoys May 2013 rev4	Mike Hadley	WG2
ENG6- 10.3	ENG6-10.3 (ENG5-11.2.16) WG2 Sub Working Group Buoys and Moorings - Report(1)	ENG5	WG2
ENG6- 10.4	(ENG5-11.2.9) 20161013 guideline 1006 new template Plastic buoys	ENG5	WG2
ENG6- 10.5	(ENG5-11.2.7) Draft Guideline 1036 Ed.2 on Environmental Management	ENG5	WG2
ENG6- 10.6	(ENG5-11.2.8) Draft Guideline on Providing Aton Services In Extremely Hot And Humid Climates 13 Oct.16	ENG5	WG2
ENG6- 10.7	(ENG5-11.2.3) Draft IALA Guideline Ed.1 on Commissioning reformatted - 13-10-16 post plenary	ENG5	WG2
ENG6- 10.8	(ENG5-11.2.5) Draft Guideline 1092 Ed2 Safety Management for AtoN Activities Date	ENG5	WG2
ENG6- 10.9	(ENG5-11.2.4) Draft IALA Guideline Ed.1 Maintenance of AtoN Structures reformatted	ENG5	WG2

Number	Input Paper Title	Source	Presented by / WG
ENG6- 10.10	(ENG5-11.2.6) WG2 Draft Guideline on Use of Modern AtoN Equipment in Heritage Lighthouses	ENG5	WG2
ENG6- 10.11	(ENG5-11.2.10) Navguide Update Plan updated at ENG5	ENG5	WG2
ENG6- 10.12	(ENG5-11.2.11) Strategy for ENG WG2 Task Group 4 (formerly Heritage Forum)	ENG5	WG2
ENG6- 10.13	(ENG5-11.2.12) IALA Guideline 1067-3 Ed.1 Electrical Energy Storage for AtoN May2008 rev5	ENG5	WG2
ENG6- 10.14	(ENG5-11.2.18) Draft IALA Guideline 1067-0 Ed1.1 on Selection of Power Systems for AtoN and Associated Equipment Jun2011 rev3 - 12-10-16	ENG5	WG2
ENG6- 10.15	(ENG5-10.1.3) IALA Guideline 1067-1 Ed.1 Total Electrical Loads of Aids to Navigation May2009 rev3 - 16-03-17 rev f	ENG5	WG2
ENG6- 10.16	(ENG5-11.2.20) Draft IALA Guideline 1067-2 Ed.1 Power Sources May2009 rev2	ENG5	WG2
ENG6- 10.17	Transition to wave power generators in Japan	Yoku Santo	WG2
ENG6- 10.18	Measurements of Temperature vs. different surface colours on battery box	Mariano Luis Marpegan	WG2
ENG6- 10.19	WWA Model Courses for review at ENG6	WWA	WG2
ENG6- 10.20	ENG6-10.20 IALA Model Course L2 Module 1.1 An introduction to Shore Marks Ed.1 May 2013 rev2.docx	WWA	WG2
ENG6- 10.21	IALA Model Course L2 Module 5.1&2 Ed.1 Surface preparation before coating May 2013	WWA	WG2
ENG6- 10.22	IALA Model Course L2 Module 2.4 on Wind Generators Ed.1 December 2013	WWA	WG2
ENG6- 10.23	IALA Model Course L2 Module 2.5&6 Mains AC power systems petrol and diesel generators Ed.1 December 2013	WWA	WG2
ENG6- 10.24	IALA Model Course L2 Module 2.7 Ed.1 Lightning Protection December 2013.	WWA	WG2
ENG6- 10.25	IALA Model Course E-141-1 Level 1 AtoN Manager Training Ed.1 December 2015 rev7	Mike Hadley	WG2
ENG6- 10.26	IALA Model Course L1 Module 5 Historic Lighthouse Projects Ed.1 December 2014 rev2	Mike Hadley	WG2
ENG6- 10.27	IALA Model Course L2 Module 0 Overview Ed.3 June 2016 rev1	Mike Hadley	WG2
ENG6- 10.28	IALA Model Course L2 Module 1.3&4 Introduction to AtoN Buoyage Ed.2 June 2016 rev5	Mike Hadley	WG2
ENG6- 10.29	IALA Model Course L2 Module 8.1 AIS AtoN Operations Ed.1 May 2013 rev2	Mike Hadley	WG2
ENG6- 10.30	IALA Model Course L2 Module 10.1&2 Remote monitoring of AtoN Ed.1 December 2013 rev2	Mike Hadley	WG2
ENG6- 10.31	IALA Model Course V-103-1 Ed.2 December 2009 Draft 11Jan17 rev1	Mike Hadley	WG2
ENG6- 10.32	Draft IALA Recommendation on Conserving the Built Heritage of Lighthouses and other Aids to Navigation	IALA Secretariat	WG2

Number	Input Paper Title	Source	Presented by / WG
ENG6- 10.33	Proposal work item IALA guideline and manual on operation and management for AtoN Simulator Ver2	Ju-Seop Han	WG2
ENG6- 10.34	Sea Test Results of plastic buoys trial-3 Ver2	Ju-Seop Han	WG2
ENG6- 10.35	Discussion on buoys on-site tests procedure	Marine Saccoman	WG2
ENG6- 10.36	(ENAV20-4.9) MTCAS- An e-Navigation Assistance System for Cooperative Collision Avoidance at Sea	ENAV20	WG2
ENG6- 10.37	(ENAV20-14.1.20) Liaison to ENG-ANM-VTS On Use of Racons in Busy Harbours	ENAV20	WG2
ENG6- 10.37.1	(ENAV20-13.11) On Racons in Busy Harbours 24 February 2017	ENAV20	WG2
ENG6- 10.38	(ENAV20-14.1.27) liaison to ENG on VHF performance in harsh environments	ENAV20	WG2
ENG6- 10.39	The 19th IALA Conference World Lighthouse Heritage Exhibition	Bae Yong Chan	WG2
ENG6- 10.40	Incheon Declaration Purpose, Key Content and Action Plans	Bae Yong Chan	WG2
ENG6- 10.41	(SLP1-15.4) Draft IALA Guideline 1067-3 Ed.1 Electrical Energy Storage for AtoN 23-3-17 rev e Koblenz	Workshop on Sustainable Light & Power	WG2
ENG6- 10.42	(SLP1-15.5) Draft IALA Guideline 1067-2 Ed.1 Power Sources 23-3-17 rev b	Workshop on Sustainable Light & Power	WG2
ENG6- 10.43	(SLP1-15.6) IALA Guideline 1039 Ed.2 Designing Solar Power Systems for Aids to Navigation March 2017	Workshop on Sustainable Light & Power	WG2
ENG6- 10.44	(SLP1-15.7) IALA PV solar calculator 2017 03 23	Workshop on Sustainable Light & Power	WG2

## ANNEX E LIST OF OUTPUT AND WORKING PAPERS

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

Number	Output Paper Title	Source	Action
ENG6- 11.1.1	(ENG6-10.5) Draft Guideline 1036 Ed.2 on Environmental Management	WG2	To Council
ENG6- 11.1.2	(ENG6-10.20) IALA Model Course L2 Module 1.1 An introduction to Shore Marks Ed.1 May 2013 rev2.docx	WG2	To Council
ENG6- 11.1.3	IALA Model Course L2 Module 5.1&2 Ed.1 Surface preparation before coating May 2013	WG2	To Council
ENG6- 11.1.4	IALA Model Course L2 Module 2.4 on Wind Generators Ed.1 December 2013	WG2	To Council
ENG6- 11.1.5	IALA Model Course L2 Module 2.5&6 Mains AC power systems petrol and diesel generators Ed.1 December 2013	WG2	To Council
ENG6- 11.1.6	IALA Model Course L2 Module 2.7 Ed.1 Lightning Protection December 2013	WG2	To Council
ENG6- 11.1.7	IALA Model Course L2 Module 10.1&2 Remote monitoring of AtoN Ed.1 December 2013 rev2	WG2	To Mike Hadley
ENG6- 11.1.8	IALA Model Course L2 Module 8.1 AIS AtoN Operations Ed.1 May 2013 rev2	WG2	To Mike Hadley
ENG6- 11.1.9	IALA Model Course L2 Module 1.3&4 Introduction to AtoN Buoyage Ed.2 June 2016 rev5	WG2	To Mike Hadley
ENG6- 11.1.10	IALA Model Course L2 Module 0 Overview Ed.3 June 2016 rev1	WG2	To Mike Hadley
ENG6- 11.1.11	IALA Model Course E-141-1 Level 1 AtoN Manager Training Ed.1 December 2015 rev7	WG2	To Mike Hadley
ENG6- 11.1.12	Draft IALA Standard 1010 AtoN Planning & Service Requirements	Vice Chair	To Secretariat
ENG6- 11.1.13	Draft IALA Standard 1020 AtoN Design & Delivery	Vice Chair	To Secretariat
ENG6- 11.1.14	Draft IALA Standard 1030 Radio Navigation Services	Vice Chair	To Secretariat
ENG6- 11.1.15	Draft IALA Standard 1040 Vessel Traffic Services	Vice Chair	To Secretariat
ENG6- 11.1.16	Draft IALA Standard 1050 Training & Certification	Vice Chair	To Secretariat
ENG6- 11.1.17	Draft IALA Standard 1060 Digital Communication Technologies	Vice Chair	To Secretariat
ENG6- 11.1.18	Draft IALA Standard 1070 Information Services	Vice Chair	To Secretariat
ENG6- 11.1.19	Draft IALA Recommendation on Environmental Responsibility	WG2	To Council
ENG6- 11.1.20	Liaison note to ARM Committee regarding NAVGUIDE revision	WG2	To ARM6
ENG6- 11.1.20.1	(ARM5-12.2.9) WG2 Navguide 2015 tracking table - updated ENG6	WG2	To ARM6
ENG6- 11.1.21	Draft IALA Recommendation on Conserving the Built Heritage of Lighthouses and other Aids to Navigation	WG2	To Council
ENG6- 11.1.22	Draft Recommendation E-106 Retroreflecting Materials	WG1	To Council
ENG6- 11.1.23	Liaison note to ARM Committee regarding mobile AtoN	WG1	To ARM6

Number	Output Paper Title	Source	Action
ENG6- 11.1.24	The 19th IALA Conference Incheon Declaration Purpose, Content and Ac_v170329 second draft	WG2	To ARM6 To PAP33 To LAP To ISC
ENG6- 13.1	Report on session 6 of the ENG Committee (ENG6)	IALA Sec	To Council for noting

Working Papers are documents that will remain within the committee for further review.

Number	Working Paper Title	Source	Action
ENG6- 11.2.1	Draft Guideline 1092 Ed2 Safety Management for AtoN Activities March 2017	WG2	To ENG7
ENG6- 11.2.2	Draft Guideline on Use of Modern AtoN Equipment in Heritage Lighthouses	WG2	To ENG7
ENG6- 11.2.3	WG2 Sub Working Group Buoys and Moorings - Report	WG2	To ENG7
ENG6- 11.2.4	Draft Guideline 1006 new template Plastic buoys 20161013	WG2	To ENG7
ENG6- 11.2.5	Draft Guideline on Providing Aton Services In Extremely Hot And Humid Climates 13 Oct.16	WG2	To ENG7
ENG6- 11.2.6	Draft IALA Guideline Ed.1 Maintenance of AtoN Structures ENG6	WG2	To ENG7
ENG6- 11.2.7	IALA Guideline 1067-3 Ed.1 Electrical Energy Storage for AtoN 30-3-17 rev b	WG2	To ENG7
ENG6- 11.2.8	Draft IALA Guideline 1067-2 Ed.1 Power Sources 30-3-17 rev d	WG2	To ENG7
ENG6- 11.2.9	Draft IALA Guideline 1067-0 Ed1.1 on Selection of Power Systems for AtoN and Associated Equipment Jun2011 rev3 - 28-03-17	WG2	To ENG7
ENG6- 11.2.10	IALA Guideline 1067-1 Ed.1 Total Electrical Loads of Aids to Navigation May2009 rev3 - 16-03-17 rev f	WG2	To ENG7
ENG6- 11.2.11	ENG Committee Workplan 2014-18 - updated at ENG6	Vice Chair	To ENG7
ENG6- 11.2.12	ENG Work Programme Task Register - updated at ENG6	Vice Chair	To ENG7
ENG6- 11.2.13	Draft IALA Guideline Ed.1 on Commissioning reformatted - ENG6	WG2	To ENG7
ENG6- 11.2.14	IALA Guideline 1039 Ed.2 Designing Solar Power Systems for Aids to Navigation March 2017 rev2	WG2	To ENG7
ENG6- 11.2.15	IALA Solar Tool	WG2	To ENG7
ENG6- 11.2.16	Suggested content for the IALA Solar Sizing webpage	WG2	To ENG7
ENG6- 11.2.17	Draft Recommendation on Marine Signal Lights Colours 20170303	WG1	To ENG7
ENG6- 11.2.18	Draft Recommendation Marine Signal Lights Luminous Range 20170303	WG1	To ENG7
ENG6- 11.2.19	(ENG5-9.29) E-200-4 - Recommendation E-200-4 draft	WG1	To ENG7
ENG6- 11.2.20	ENG workplan ideas for 2018-2022	Chair	To ENG7
ENG6- 11.2.21	Draft Guideline On Intensity Calculations 20170302	WG1	To Frank Hermann

Task		Start Session	Planned End Session	Revised End Session	Progress Indicator			Status Overview
					Green	Yellow	Red	
WG1 – Visual & Physical AtoN								
1.1.1	Produce a Guideline on Marine Signalling	2	5	7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.1.2	Develop guidance on the selection of rhythmic characters including 1069 Synchronisation	2	5		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complete
1.1.3	Update / Replace 1038 On Ambient Lights Levels	2	5		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complete
2.5.1.	Populate the S100 registry for relevant AtoN classes	3	6	7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5.1.1	Update the Navguide as requested by ARM Committee	5	6	2-7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Updated by Liaison note from ARM
5.1.2	Review of IALA documents	1	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.1.3	Review and Update E200 On Marine Signal Lights	3	6	4-7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.1.4	Update E-106 For the use of retro-reflecting material on aids to navigation marks within the IALA Maritime Buoyage System	4	5	6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complete
5.1.5	Review and Update E108 Ed 2 For the Surface Colours used as visual signals on aids to navigation	6	6	7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.1.6	Review of IALA Recommendation E-110 for the Rhythmic Characters of Lights on Aids to Navigation (2012)	6	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complete
5.1.7	Update Recommendation E-111 For port traffic signals	4	5	7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Task extended to ENG7
5.1.8	Update E-112 For Leading Lights and 1023 for the design of leading lights	4	6	7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.1.9	Merge and update 1043 On Light Sources and 1048 On LED Technologies and 1049 On The Use of Modern Light Sources in Traditional Lighthouses	2	4	5-7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.1.10	Update 1041 On Sector Lights	1	3		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complete
5.1.11	Update 1061 Illumination of Structures	1	2	5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Insufficient time to complete Moved to 2018-22 work period
5.1.12	Update 1065 On Aids to Navigation Signal Light Beam Vertical Divergence	6	6		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Task extended by 1 session
5.1.13	Review and Update of Guideline 1073 on Conspicuity of AtoN at Night	5	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.1.14	Review and Update Guideline 1069 on Synchronisation of Lights	2	5		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complete
5.2.1	Identify current documents as potential Standards, Recommendations, Guidelines & Manuals	5	7		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Task completed elsewhere
5.3.1	Presentation to ENG committee on new developments in AtoN & related topics	1	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Task		Start	Planned	Revised	Progress Indicator			Status
<b>WG2 – Knowledge &amp; Sustainability</b>								
1.5.2.	Workshop on Lights and Batteries – IALABATT/IALALITE	1	6		☒	☐	☐	Complete
2.1.1.	Develop further guidance on plastic buoys, systems & sensors	1	6	7	☐	☒	☐	To be finalized at ENG7
2.1.2	Engineering guidance on the implementation of e-Navigation systems	3	7		☒	☐	☐	To be continued at ENG7
2.2.1.	Develop guidance on sustainable AtoN design & maintenance.	3	6		☒	☐	☐	Complete at ENG6
2.2.2.	Develop guidance on the commissioning of AtoN equipment and systems and engineering audits.	2	5	7	☐	☒	☐	To be complete at ENG7
2.3.1	Develop guidance on AtoN design & maintenance for hot climates.	4	7		☒	☐	☐	To be finalised at ENG7
2.3.2	Workshop on AtoN delivery and maintenance in extreme heat	3	4		☒	☐	☐	Complete
2.4.1	Review and update guidance on safety of personnel	4	7		☒	☐	☐	To be completed at ENG7
3.2.1.	Support the WWA in updating model courses on standards for training and certification of AtoN personnel	1	7		☒	☐	☐	
4.1.1.	Develop guidance on the use of heritage lighthouses for modern AtoN equipment & systems.	3	6		☐	☒	☐	To be continued at ENG7
4.1.2.	Develop guidance on Maintenance of AtoN structures	2	6		☐	☒	☐	To be continued at ENG7
5.1.1.	Navguide updates	3	6	7	☐	☒	☐	To be completed at ENG7
5.1.2.	Review of IALA documents (ref ENG1 input paper on document ownership)	1	7		☒	☐	☐	Commenced at ENG3
5.3.1	Presentation to ENG committee on new developments in AtoN & related topics	1	7		☒	☐	☐	
5.3.2	Develop the IALA Wiki	1	7		☒	☐	☐	Ongoing
5.3.3	Develop the IALA Dictionary	1	7		☒	☐	☐	Ongoing



*Action Items for Secretariat*

1. The Secretariat is requested to forward the revised ENG Committee Workplan, ENG6-11.2.11, to ENG7. 10
2. The Secretariat is requested to forward the revised ENG Work Programme Task Register for 2014-2018, ENG6-11.2.12, to ENG7. 10
3. The Secretariat is requested to forward paper ENG6-11.2.20, future work programme, to ENG7. 10
4. The Secretariat is requested to forward the working papers ENG6-11.2.17, ENG6-11.2.18, ENG6-11.2.19 and ENG6-11.2.21 to ENG7. 11
5. The Secretariat is requested to forward ENG6-11.1.22, Draft Recommendation E-106 Retroreflecting Material, to Council for approval. 11
6. The Secretariat is requested to hold the input paper ENG6-9. 5 indefinitely until this task is started. 12
7. The Secretariat is requested to provide the leading lines calculation spreadsheet on the calculations section of the IALA website with a link to Guideline 1023 and Recommendation E-112. 12
8. The Secretariat is requested to forward working paper ENG6-9.7 to ENG7. 13
9. The Secretariat is requested to forward input paper ENG6-9.26 to the ENG7. 13
10. The IALA Secretariat is requested to forward working papers ENG6-11.2.3 and ENG6-11.2.4 to ENG7. 13
11. The IALA Secretariat is requested to forward output paper ENG6-11.1.1 and ENG6-11.1.19 to Council for approval. 14
12. The IALA Secretariat is requested to forward working paper ENG6-11.2.13 to ENG7. 14
13. The IALA Secretariat is requested to forward working paper ENG6-11.2.5 to ENG7. 14
14. The IALA Secretariat is requested to forward working paper ENG6-11.2.1 to ENG7. 14
15. The IALA Secretariat is requested to forward output papers ENG6-11.1.2, ENG6-11.1.3, ENG6-11.1.4, ENG6-11.1.5 and ENG6-11.1.6 to the IALA Council for approval. 15
16. The IALA Secretariat is requested to forward output papers ENG6-11.1.7, ENG6-11.1.8, ENG6-11.1.9, ENG6-11.1.10 and ENG6-11.1.11 to Mike Hadley for finalisation. 15
17. The Secretariat is requested to note that two entries of course L2 3.1-3 exist, they both seem the same but with different titles; to avoid confusion one should be removed. One is entitled Introduction to Marine Signal Lanterns, the other Introduction to Marine Lanterns. 15
18. The Secretariat is requested to note that there are two courses with the same reference L2.1.14. One is Power systems on Buoys, the other an Introduction to Shore Marks. The Power systems one is better placed in Module 2 but needs a new element number. 15
19. The Secretariat is requested to note that Model Course L2.2.2 Primary & Secondary Battery Maintenance is shown as L2.2 on the web page and "Module 2 Element 2.1 (L2.2.2)" on the front page of the document. It is assumed that it should be L2.2.2 on all references. 15
20. The Secretariat is requested to correct front page colour errors in Model Courses published in June 2017. 15
21. The Secretariat is requested to complete formatting and publish Model Courses approved in December 2017. 15
22. The IALA Secretariat is requested to forward working paper ENG6-11.2.2 to ENG7. 16
23. The IALA Secretariat is requested to forward working paper ENG6-11.2.4 to ENG7. 16
24. The IALA Secretariat is requested to forward Liaison Note ENG6-11.1.20 and ENG6-11.1.20.1 to the ARM Committee. 16
25. The IALA Secretariat is requested to forward Working Paper ENG6-11.1.20.1 to ENG7. 16



26.	The Secretariat is requested to retain a page on the File Share for long term retention of AtoN photos.	16
27.	The IALA Secretariat is requested to forward Working Paper ENG6-11.2.3, ENG6-11.2.4, ENG6-11.2.14, ENG6-11.2.16, ENG6-11.2.15, ENG6-11.2.7, ENG6-11.2.8, ENG6-11.2.9 and Working Paper ENG6-11.2.10 to ENG7.	16
28.	The Secretariat is requested to send Output Paper ENG6-11.1.19 to Council for approval.	17
29.	The Secretariat is requested to send Output Paper ENG6-11.1.21 to Council for approval.	17
30.	The Secretariat is requested to note the comments in papers ENG6-11.1.12 to ENG6-11.1.18.	17
31.	The Secretariat is requested to forward the draft Incheon declaration ENG6-11.1.24 to LAP, PAP, ISC for the 2018 Conference and ARM Committees for review and comment to Mr Yong-Chan Bae.	18
32.	The IALA Secretariat is requested to forward output papers ENG6-11.1.7, ENG6-11.1.8, ENG6-11.1.9, ENG6-11.1.10 and ENG6-11.1.11 to Mike Hadley for finalization.	18
33.	The Secretariat is requested to contact Tony Taylor from Pharos Marine re pending patents announced at the workshop on Sustainable Light and Power for the Next Generation in Koblenz.	18
34.	The Secretariat is requested to forward the ENG6 Committee report (ENG6-13.1) to Council to note.	19

### *Action Items for Participants*

35.	David Jeffkins is requested to upload the input papers ENG6- 9.18 and ENG6-9.19 onto the IALA Wiki.	7
36.	Committee Members are requested to ensure that definitions in IALA documents are consistent with the Dictionary.	8
37.	ENG Committee members are requested to submit articles for the IALA Bulletin to Marie-Helene Grillet.	9
38.	Alwyn Williams is requested to provide input to ENG7 on E-200-3 Measurement.	11
39.	Frank Hermann, Fernando Romero & Partel Keskkula are requested to work on the guideline intersessionally and submit an input paper to ENG7.	11
40.	Committee members are requested to provide information on meteorological data for their respective regions and any local conditions visibility factor used. E.g. greater than 90%.	11
41.	Jorgen Royal Petersen, Sami Lasma and Sigge Gustafsson are requested to work intersessionally on the Guideline on Retroreflectors and submit an input paper to ENG7.	11
42.	Frank Hermann is requested to submit a revised E-108 (similar to the format of E200-1) to ENG7.	11
43.	ENG Committee Members are requested to submit input papers in support of the revision of Recommendation E-111 on Port Traffic Signals for the next work programme.	12
44.	Simon Millyard and David Jeffkins are requested to note the request to move the task of updating Guideline 1023 and Recommendation E-112 to the next work period programme.	12
45.	Colin Day and Link Powell are requested to work on draft Guideline 1043, ENG6-9.6, and draft Guideline 1049, ENG6-9.25 intersessionally and provide an input paper to ENG7.	12
46.	Simon Millyard and David Jeffkins are requested to note the proposal to move the task of updating Guideline 1041 to the next work programme.	12
47.	Committee participants are requested to provide any relevant information from their respective regions regarding the use of plastic buoys in hot climate and high UV exposure environments, power supply for buoys and remote control technologies to ENG7.	13
48.	Committee participants are requested to provide any relevant information from their respective regions regarding trials or work on integration of e-navigation systems with conventional AtoN equipment and systems to ENG7.	14
49.	Participants are requested to review working paper ENG6-11.2.13 and provide feedback to ENG7.	14

50.	Committee participants are asked to review ENG6-11.2.1 intersessionally and provide comments to ENG7.	15
51.	Committee participants are requested to provide input to ENG7 on any relevant experience with the use of modern AtoN equipment and systems in heritage lighthouses.	16
52.	Committee Members are requested to review working paper ENG6-11.2.4 on Maintenance of Aton Structures and provide feedback or information on maintenance systems or processes in their respective organisations to ENG7.	16
53.	Members are requested to submit updated photos and illustrations for the Navguide to ENG7.	16
54.	David Jeffkins is requested to update the on-line Navguide as agreed.	16
55.	Committee participants are encouraged to consider sending heritage AtoN artefacts for the 2018 IALA Conference and to contact members of the Heritage Forum for further details.	18
56.	Ministry of Oceans and Fisheries, Republic of Korea [MOF] is requested to consider whether an Interpretation Plan is necessary.	18
57.	The MOF is requested to consider an exhibition catalogue/education pack for the Conference Lighthouse Heritage Exhibition.	18
58.	The MOF is requested to arrange the opening ceremony for the Conference Lighthouse Heritage Exhibition.	18
59.	The MOF is requested to design all interpretation for the Conference Lighthouse Heritage Exhibition.	18
60.	The MOF is requested to draw up an artefact wish list for the Conference Lighthouse Heritage Exhibition.	18
61.	The MOF is requested to seek clarification on shipping/insurance costs for artefacts.	18
62.	The MOF is requested to arrange events programme for the Conference Lighthouse Heritage Exhibition.	18
63.	WG2 TG4 is requested to arrange a conference call/video call early-mid October, shortly before ENG7.	18



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