



REPORT OF THE 5TH SESSION OF THE IALA ATON ENGINEERING AND SUSTAINABILITY (ENG) COMMITTEE

10 to 14 October 2016

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Report of the 5th Session of the IALA AtoN Engineering and Sustainability (ENG) Committee 10 to 14 October, 2016 Executive Summary

The fifth meeting of the ENG Committee (ENG5) was held from 10th to 14th October 2016 in IALA HQ.

The session was attended by 60 participants from 27 countries, of which 36 were National Members, 13 were Industrial Members, 9 were Associate Members, 2 were observers. Eight members attended for the first time.

The Committee considered 105 input papers and produced 24 output documents including 5 revised Academy model courses and 22 working papers.

The revision of IALA Documents to comply with the IALA Strategy continued, with the completion of a new Guideline on selection of rhythmic characters and synchronisation of lights for AtoN, development of a new Guideline on commissioning and revision of two further Guidelines and one Recommendation. Proposals were submitted that two Guidelines be revoked.

Good progress has been made on preparing for the workshop on Sustainable Light & Power for the Next Generation in Koblenz in March 2017. The output from the workshop on AtoN Services in Extremely Hot Climates in Doha was developed towards a new Guideline.

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

The operation of the Dictionary Working Group (DWG) was reviewed in the light of discussion at PAP32 and amendments were agreed regarding DWG operating procedures.

Support for the Academy continued with revision of five model courses.

The ENG Committee Chair completed the Level 1 AtoN manager course. He is now a fully certified AtoN manager and is the first person to have completed successfully the three sections of first Distance Learning Level 1 AtoN manager course.

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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All tasks progressing per current plan except task 1.1.1 which is extended to ENG6.
TD#2 – AtoN design and maintenance	8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All tasks progressing per current plan except task 2.2.2 which is extended to ENG6.
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All tasks progressing per current plan.

Task	Number Tasks	Progress Indicator			Status Overview
		Green	Yellow	Red	
Across all domains	18	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All tasks progressing per current plan except tasks 5.1.4 and 5.1.7 which are extended to ENG6 and task 5.1.11 which is delayed until the 2018-22 work period due to insufficient time.

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Report of the 5th Session of the IALA ENG Committee

GENERAL

The 5th session of the IALA AtoN Engineering and Sustainability Committee (ENG) was held from 10th to 14th October 2016 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 (ENG5-1.2) was adopted.

1.2 Welcome from the IALA Deputy Secretary-General

The Deputy Secretary-General of IALA, Mr Card, reported on events since ENG4. The IALA website has been updated and provides access to a file sharing system provided to assist Committees with their work, provides access to the IGO documents and IALA basic documents. Preparation of IALA Standards for introduction in 2018 is progressing, as is the technical direction statements document. LAP17 and PAP32 meetings were held in recent weeks. Facilities to improve IALA capability to handle meetings with large number of attendees such as videoconference have been provided and further adjustment of rooms in IALA HQ is planned. Work on implementing the new IALA corporate image is progressing well. Omar Frits Eriksson has taken up the position of Dean of the Academy and nominations for a replacement Chair of the ENAV Committee have been invited for considerations at Council 63. The first meeting of the Joint VTS-ENAV group was held in conjunction with VTS42 and the VTS Symposium in Kuala Lumpur. For future work a view is emerging of ENAV as the back office for future VTS. Membership of IALA is increasing for all classes of membership. Work on VDES is progressing in the ENAV Committee with a Guideline on VDES and Frequently Asked Questions (FAQ) about to be published on the IALA website.

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 60 participants from 27 countries, of which 36 were National Members, 13 were Industrial Members, 9 were Associate Members, two were observers. Eight members attended for the first time.

The list of Committee Members who attended ENG5 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 ENG5-1.4, was approved.

2. REVIEW OF ACTION ITEMS FROM ENG4

Input paper ENG5-2.1 refers. Action items for the IALA Secretariat from ENG4 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. It was observed that the input papers for each Working Group (WG) were identifiable from the document number. The Committee considered 105 input papers.

3.2 Identify input papers suitable for uploading to the IALA Wiki

The following papers were identified as suitable for retention on the IALA Wiki:

- ENG5-9.27 - Report Multi-Light Distribution Korea KOPTI 2016-09-22 final;
- ENG5-10.25 - Report on performance of maritime Hybrid renewable energy system in Korea;
- ENG5-10.27 IALA Guideline 1035 Ed.2 Availability and Reliability of Aids to Navigation December 2004 rev1.

Action

David Jeffkins is requested to upload input papers ENG5-10.25, 10.27 to the IALA Wiki.

4. REPORTS FROM OTHER BODIES

4.1 Reports from IALA Council – 62nd Session

The Committee noted the report of the 62nd Session of the IALA Council held in Lisbon, Portugal, from 21st to 24th June 2016. Paper ENG5-4.1 refers.

4.2 PAP31, 6 to 7 April 2016

The Committee noted the report of the 31st Session of the IALA Policy Advisory Panel (PAP31), from 6th to 7th April 2016 in IALA HQ. Paper ENG5-4.2.1 refers. Priority issues were the IALA Standards, movement of IALA to IGO status and the IALA Basic Documents. Work to ensure the consistency and accuracy of the Dictionary is progressing. The Committee also noted the procedure for submission to the IMO MSC. Paper ENG5-4.2.2 refers.

4.3 Report on the 96th session of the IMO Maritime Safety Committee

The Committee noted the report of the report on the 96th session of the IMO Maritime Safety Committee, from 10th to 20th May 2016. Paper ENG5-4.3 refers.

4.4 Report IALA WS on Shore-based Maritime Services from Theory to Practical Use, Lisbon

The Committee noted the report of the IALA Workshop on Shore-based Maritime Services from Theory to Practical Use held in Lisbon, Portugal, from 24th to 26th May 2016. Paper ENG5-4.4 refers.

4.5 Report IALA Workshop on AtoN Services in Extremely Hot Climates

The Committee noted the report of the IALA Workshop of the IALA Workshop on AtoN Services in Extremely Hot Climates held in Doha, Qatar, from 4th to 7th September 2016, paper ENG5-4.5 refers.

5. REPORTS FROM RAPPORTEURS

5.1 Developments in Renewable Energy Sources

Peter Dobson reported on the smart flower, a self-contained solar system, with a 2.3kW solar tracking array with built-in lithium batteries capable of providing up to 3kW AC mains continuous load. The unit costs approximately £25,000. Paper ENG5-5.1 refers.

5.2 Developments in Battery Technology

Jonas Lindberg reported on new limitations on transport of lithium-ion batteries.

5.3 Developments in New Light Sources

Alwyn Williams reported on BMW developments in LASERs that may become suitable for AtoN applications in the future.

Malcolm Nicholson reported that development of LEDs is focussed mainly on white lights with the result that coloured LEDS are becoming more difficult to acquire.

5.4 CIE-IALA Liaison

Alwyn Williams reported that modified Allard is the CIE TC2-49 recommended method of calculating effective intensity. However it is considered that further modification of the modified Allard method may be required.

5.5 Developments in AtoN Simulation Systems

Jimin YEO reported on an AtoN simulator designed to assist the decision making for AtoN design and AtoN placement planning taking into consideration the effects of topographical, environmental and maritime traffic characteristic in the target navigation area. He described the structure and content of a Guideline (operator's manual) on operation and management for the AtoN simulator. Paper ENG5-5.5 refers. It was proposed that a Guideline for comprehensive AtoN Simulation including existing IALA AtoN Simulation documentation such as Guidelines 1058 and 1097 and Recommendation O-138 should be added and processed as a new work item in the 2018 – 2022 work programme and that an independent manual for operation of AtoN Simulator be drawn up.

Action

The Chair of the ENG Committee is requested to consider a Guideline for comprehensive AtoN Simulation including existing AtoN Simulation Guidelines such as Guidelines 1058 and 1097 and Recommendation O-138 should be added and processed as a new work item in the 2018 – 2022 work programme and that an independent manual for operation of AtoN Simulator be included in the 2018 – 2022 work plan.

5.6 Developments in remote control and monitoring

Peter Schneider reported on a project to carry out trials on energy consumption, using a team of students. A report will be provided to ENG6. He also described work on a services management system for remote monitoring and control.

5.7 IALA Dictionary

A short demonstration of the IALA Dictionary was presented.

The Committee was advised that, following PAP32, the policy of removing definitions from IALA documents no longer applies and definitions may be included as necessary at discretion of the authors but must be cross checked with the Dictionary to ensure consistency.

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. Aline deDievre will assist with the preparation of the Bulletin. The deadline for submission of articles is two months before publication. The next issue of the Bulletin for which articles can be accepted is late 2016. Two issues per year will be published.

Action

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

6. PRESENTATIONS

Five 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

Input paper ENG5-6.1 refers. Stephen Bennett described the recent activity in the Academy since ENG4.

The Academy was pleased to report that the ENG Committee Chair was the first person to have completed successfully the 3 sections of first Distance Learning Level 1 AtoN manager course. He is now a fully certified AtoN manager. A further 11 participants passed successfully the tests for Modules 1; 2 or 4;5. The formal Distance Learning programme will now start in January 2017. All ENG participants were encouraged to do the Level 1 course using the new Distance Learning facility.

The Committee congratulated Omar Frits Eriksson on his appointment as Dean of the Academy.

6.2 6.2. Visibility-Adaptive AtoN Light (VAAL) – Aivar Usk

Aivar Usk described a Visibility-Adaptive AtoN Light (VAAL) concept that foresees utilisation of existing or future dependable national weather data networks and AtoN telematics data links for provision of AtoN light signals of nearly constant range to mariners without the need for adding any local sensors to AtoN sites. A network centric VAAL Concept Demonstrator test project undertaken by Cybernetica AS and the Estonian Maritime Administration supported by the EfficienSea2 project is underway in Estonia, with interim results suggesting that such systems are feasible. Paper ENG5-6.2 refers.

In discussion it was stated that VAAL communications may be possible using the VDES in future. From a cost benefit viewpoint, it was noted that larger solar powered AtoN (10NM) with long flash length characters as well as longer range (3NM) buoys would benefit most from use of the VAAL.

6.3 Marine Signal Lights Service Conditions Factor

Link Powell considered the recommended service factor of 0.75 used to account for the degradation of luminous intensity under service conditions, due to light source degradation, dirt and salting of lanterns etc., when calculating the nominal range of an AtoN light for publication. He concluded that a higher service factor (ie less than 0.75) may be required in some cases and is dependent on the local conditions and lantern / lens cleaning interval. Paper ENG5-6.3 refers.

6.4 Implementation of AIS-AtoN real and virtual on Antarctic zone

Mariano Marpeggan described a project carried out by the Argentinian Navy - Antarctic Naval Command - Naval Hydrography Service - Hidrovía S.A. to provide AIS-AtoN on the Orcadas Islands and the Antarctic zone in Argentina. He noted that this project has solved an AtoN provision problem with providing physical AtoN in ice conditions. Paper ENG5-6.4 refers.

In discussion it was noted that humidity in hot climate regions attenuates VHF range. VHF ranges of 60NM to 100NM are achieved with AIS in Antarctic Argentina.

6.5 An introduction to e-Navigation

Alwyn Williams provided a description of e-navigation, recalling the reasons for implementing the e-navigation concept and described some e-navigation services, the common maritime data structure, the maritime cloud, maritime service portfolios and the problems of harmonisation. Paper ENG5-6.5 refers.

In discussion it was pointed out that e-navigation should apply to all vessels.

7. REVIEW OF WORK PROGRAMME AND WG EXPECTATIONS

7.1 Work review

The ENG Committee Workplan, was updated. Paper ENG5-11.2.1 refers.

The ENG Work Programme Task Register for 2014-18 was updated. Paper ENG5-11.2.2 refers.

The Deputy Secretary-General described the emerging IALA document structure comprising Standards, Recommendations, Guidelines, Manuals and Model courses, linking the project to the IALA Strategy. He noted the process required to introduce IALA Standards through the General Assembly in 2018 and a diplomatic conference in Korea in 2018. Papers ENG5-7.5, ENG5-7.3 and ENG5-7.4 refer.

Action

The Secretariat is requested to forward the revised ENG Committee Workplan, ENG5-11.2.1, to ENG6.

The Secretariat is requested to forward the revised ENG Work Programme Task Register for 2014-2018, ENG5-11.2.2, to ENG6.

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 ATO N

9.1 Develop guidance on Marine Signalling (Task 1.1.1)

Refer to Task 1.1.2 & 1.1.3

Donghee Lee from Daekee Marine Corp. presented a report on the development of small LED beacon applying multi-light distribution to enhance the recognition of signal lights to WG1, paper ENG5-9.27 refers. It was agreed to upload this to the IALA Wiki for long term reference (see section 3.2 of this report).

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

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

Action Items

The Secretariat is requested to forward the Draft Guideline on the Selection of Rhythmic Characters and Synchronisation of Lights on AtoN, paper ENG5-11.1.7, to Council for approval.

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

Work concluded on the update/replacement of the IALA 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 are still valid.

Action Items

Malcolm Nicholson is requested to provide a new fig1 for insertion in ENG5-11.1.8 prior to submission to Council.

The Secretariat is requested to forward ENG5-11.1.8 Draft Guideline on Methods and Ambient Light Levels for the Activation of AtoN Lights to Council for approval.

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

This task is due to commence at ENG6.

9.5 Navguide updates (Task 5.1.1)

A schedule to provide updates to the NAVGUIDE has been agreed between the ENG and ARM Committees. The Committee provided updates per the NAVGUIDE update schedule and a revised update 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 ENG5 with input papers from the UK and Germany. After some debate and guidance from the Secretariat it was decided that the series would be revised into four short recommendations on Colour, Range, Measurement and Effective Intensity and that the remainder of the information would be transferred to Guidelines. The Proposal from Germany on retaining two regions for green was accepted by the Committee, but requires further discussion.

Action Item

The Secretariat is requested to forward the working papers ENG4-11.2.22, ENG4-11.2.23 & ENG4-11.2.24 to ENG6.

Alwyn Williams is requested to provide input to ENG6 on draft Recommendation E-200-3 Measurement.

Frank Hermann is requested to provide input to ENG6 on Draft Recommendation E200-2 Luminous Range.

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 felt that the standard code and the comprehensive code belonged in the MBS. The additional guidance notes on the selection and installation would be used as input to a new Guideline. A liaison note from ARM indicated that the MBS would be reviewed during the next work period and at that time retroreflectors would be included. To that end, a submission to the NAVGUIDE was prepared as well as an updated Draft Recommendation E-106 on Retroreflecting Material. The new Guideline on Retroreflectors will progressed intersessionally and submitted to ENG6.

Action Item

The Secretariat is requested to forward ENG5-11.1.21 the Draft Recommendation E-106 Retroreflecting Material to ARM5 and ENG6.

Dave Jeffkins is requested to put the content of the working paper ENG5-11.2.17 on summary of retroreflectors for the NAVGUIDE to the Wiki NAVGUIDE.

Jorgen Royal Petersen, Sami Lasma and Sigge Gustafersson are requested to work intersessionally on the new Guideline on Retroreflectors and submit an input paper to ENG6.

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.

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 on updating Recommendation E-110 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.

Action Item

The Secretariat is requested to forward ENG5-11.1.9, Recommendation E-110 Ed4 Draft Rhythmic characters of lights on AtoN to Council for approval.

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 work on this task did not begin. A working paper was received from South Africa and will be considered at ENG6.

Action Item

The Secretariat is requested to forward the input paper ENG5-9.15 to ENG6.

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

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

To align with the proposed workshop on sustainable light and power (IALABATT/IALALITE), Task 5.1.9 has been delayed to nearer the end of the work program and accordingly this task was brought forward to commence at ENG3. Seven input papers were already received at ENG4 and work began on this task. The input papers were 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 provided by IALA requires updating.

Action Item

Frank Hermann, Yves-Marie Blanchard and Partel Keskkula are requested to work intersessionally on the new Guideline for Leading Lines and provide an input paper to ENG6.

Frank Hermann and Yves Marie Blanchard are requested to update the existing Excel spread sheet and then input to ENG6.

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)

This task was due to commence at ENG2. However, to align with the proposed IALABATT/IALALITE workshop, Task 5.1.9 has been transferred to nearer the end of the work program. This will also allow for the most up to date information to be included in the update. A re-formatted version of Guideline 1043 was considered and will be further reviewed and updated at the Workshop on Sustainable Light & Power.

Action Item

The secretariat is requested to forward working paper ENG5-11.2.14 to the IALABATT/LITE Workshop in Koblenz.

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. Additional time will be required to complete this work and it may be transferred to the 2018 – 2022 work period.

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

A re-formatted version of Guideline 1065 was received as an input paper which was reviewed and amended. As this task is due to start at ENG6 the Secretariat is requested to forward working paper to ENG6

Action Item

The Secretariat is requested to forward working paper ENG5-11.2.15 to ENG6.

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

A re-formatted Guideline 1073 was received as an input paper and was reviewed. Review of this Guideline will be continued at the IALABATT/LITE workshop in Koblenz.

Action Item

The secretariat is requested to forward working paper ENG5-11.2.13 to the IALABATT/LITE Workshop in Koblenz.

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

Task 5.1.14 is being amalgamated into selection of characters and the majority of the relevant information has been captured in the new Guideline on the selection of rhythmic characters. As such, Guideline 1069 is no longer required. However, there were some relative examples in the annex to this document that the Committee felt would be informative to members and that the IALA Wiki would be the place to put them.

Action Item

The Secretariat is requested to remove the annexes of Guideline 1069 on the Synchronisation of Lights and put them on the IALA Wiki.

The Secretariat is requested to arrange for IALA Guideline 1069 on the Synchronisation of Lights to be revoked as the relevant information has been captured in the new Guideline on Selection of Rhythmic Characters and Synchronisation of Lights for AtoN (ENG5-11.1.7).

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

This task has changed in view 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)

Preparations for the workshop on Sustainable Light & Power for the Next Generation (IALABATT/IALALITE) were continued. A Steering Group meeting was held during ENG5. The draft technical programme was further developed. Registration is open on the IALA website.

Action Item

Committee participants are requested to note the proposed dates for the 2017 Workshop on Sustainable Light & Power for the next generation in Koblenz, Germany.

Committee participants were encouraged to register for the Workshop on Sustainable Light & Power for the next generation in Koblenz from 20th to 24th March 2017.

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

Access to the CALMAR software and manual for the design of buoy moorings was finalised and a link created on the IALA website. The link to download the software can be located on the website in the 'Products & Projects' section, under the sub-heading 'Calculation and Working Tools'. Members are encouraged to download and try the software.

Work continued with further review and development of Guideline 1006 on Plastic Buoys. Additional information was added to the Guideline and plans made for further intercessional work.

Action Item

The IALA Secretariat is requested to forward working paper ENG5-11.2.9 to ENG6.

Committee Members 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 ENG6.

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

Alwyn Williams provided a presentation to the Committee on the e-navigation concept. The presentation was helpful in providing the Committee with an overview on the progress and direction of e-navigation. 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.

Action Item

Committee Members 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 ENG6.

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

No further intersessional input was received for Guideline 1036 since ENG4, however the document was transferred into the new IALA document format.

It was agreed that content was substantially complete and still relevant, and will be forwarded to ENG6 for finalisation. Committee members were asked to review intersessionally and comment.

Action Item

The IALA Secretariat is requested to forward working paper ENG5-11.2.7 to ENG6.

Committee members are requested to review working paper ENG5-11.2.7 and also provide any relevant information they may have with regard to environmental management to ENG6.

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

The draft Guideline on the commissioning of AtoN equipment developed at ENG4 was transferred into the new IALA document format and submitted to ENG5. Development of the draft Guideline continued at ENG5. A final draft of the guideline was finalised and forwarded to ENG6, with a view to final approval by the committee. Committee members are asked to intersessionally review and comment on the final draft.

Action Item

The IALA Secretariat is requested to forward working paper ENG5-11.2.3 to ENG6.

Members are requested to review working paper ENG5-11.2.3 and provide feedback to ENG6.

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

The draft Guideline on Providing AtoN Services in Extremely Hot and Humid Climates received from the workshop on AtoN Services in Extremely Hot Climates to ENG5 was further developed at ENG5 and will be forwarded as a working paper to ENG6.

Some input was received regarding VHF propagation in hot and humid climates and further information has been sought from the ENAV Committee, for possible inclusion in the Guideline.

Action Item

The IALA Secretariat is requested to forward working paper ENG5-11.2.8 to ENG6.

The IALA Secretariat is requested to forward Liaison Note ENG5-11.1.17 to the ENAV Committee.

10.7 Workshop on AtoN delivery and maintenance in Extreme Heat (Task Number 2.3.2)

The Workshop on AtoN Services in Extremely Hot Climates was successfully completed prior to ENG5. The Committee acknowledged the success of the workshop and the effort of all contributors and presenters.

10.8 Review and update guidance on safety of personnel (Task 2.4.1)

No further intersessional input was received for the draft Guideline on Safety of Personnel, however the document was reformatted into the new IALA format.

It was agreed that content was substantially complete and still relevant, and will be forwarded to ENG6 for completion. Committee members were asked to review intersessionally and comment.

Action Item

The IALA Secretariat is requested to forward working paper ENG5-11.2.5 to ENG6.

10.9 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 ENG5.

10.10 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)

Input papers ENG5-10.19 (L2 Model Course on Light Flashers Lamp Changes and IPS Lanterns), ENG5-10.20 (L2 Model Course on Lights and Marine Lanterns), ENG5-10.21 (Level 2 Model Course on Rotating Beacons and Classic Lenses), ENG5-10.22 (L2 Model Course on Sound Signals) and ENG5-10.23 (L2 Model Course on Range, Sector and Precision Lights) were reviewed and completed for submission to Council for approval.

Action Item

The IALA Secretariat is requested to review the style of the title page of each model course and ensure that the title is consistent with the table in E-141.

The IALA Secretariat is requested to forward output papers ENG5-11.1.2, ENG5-11.1.3, ENG5-11.1.4, ENG5-11.1.5 and ENG5-11.1.6 to the IALA Council for approval.

10.11 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 ENG5 and ENG5-11.2.6 will be forwarded to ENG6 for further work.

Some intersessional assistance will be sought from Committee Members to further develop the Guideline before ENG6.

Action Item

The IALA Secretariat is requested to forward working paper ENG5-11.2.6 to ENG6.

Committee Members are requested to provide input to ENG6 on any relevant experience with the use of modern AtoN equipment and systems in heritage lighthouses.

10.12 Develop guidance on the maintenance of AtoN structures (Task Number 4.1.2)

The draft Guideline on maintenance of AtoN structures was further developed. This included the blending of some parts of Guideline 1076 on Building Conditions of Lighthouses into the new Guideline. The Guideline will be further developed at ENG6.

Action Item

The IALA Secretariat is requested to forward working paper ENG5-11.2.4 to ENG6.

Committee Members are requested to review working paper ENG5-11.2.4 on Maintenance of Aton Structures and provide feedback or information on maintenance systems or processes in their respective organisations to ENG6.

10.13 Navguide updates (Task 5.1.1)

Review of the NAVGUIDE was further progressed. The review was guided predominantly by the NAVGUIDE Update Plan, also noting responses from the ARM Committee to Liaison Notes that were sent by ENG at ENG5. The ARM Committee redirected some of the ENG Committee's queries to Secretariat for confirmation.

The NAVGUIDE Update Plan was updated to reflect progress made at ENG5 and sent to the ARM Committee.

Action Item

The IALA Secretariat is requested to forward Liaison Note ENG5-11.1.18 to the ARM Committee.

The IALA Secretariat is requested to forward Working Paper ENG5-11.2.10 to the ARM Committee.

The IALA Secretariat is requested to forward Working Paper ENG5-11.2.10 to ENG6.

Members are requested to submit updated photos and illustrations for the NAVGUIDE to ENG6

10.14 Review of IALA documents (ref ENG1 input paper on document ownership) (Task 5.1.2)

Additional progress and some improvements of Guideline 1067 were made and the work will continue until the 2017 workshop on Sustainable Light & Power for the Next Generation.

It was noted that Guideline 1011 was still available on the IALA website, despite it being identified for replacement by Guideline 1067.

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 intercessional work is planned and revisions will be submitted to ENG6.

Action Item

The IALA Secretariat is requested to forward Working Papers ENG5-11.2.9, ENG5-11.2.12, ENG5-11.2.18, ENG5-11.2.19 and ENG5-11.2.20 to the IALABATT workshop in Koblenz.

The IALA Secretariat is requested to withdraw Guideline 1011 on a Standard Method for Defining and Calculating the Load Profile of Aids to Navigation from the IALA website as this document was replaced by Guideline 1067.

10.15 Presentation to ENG committee on new developments in AtoN & related topics (Task 5.3.1)

Refer to section 6 for details of presentations that were delivered during ENG5.

10.16 Develop the IALA Wiki (Task 5.3.2)

Input papers were uploaded to the IALA Wiki as shown in section 3.2.

10.17 Develop the IALA Dictionary (Task 5.3.3)

The procedures for management of the Dictionary through the DWG were reviewed and improved procedures agreed.

The Committee was advised of the decision of the Policy Advisory Panel that key definitions can be included in guidance documentation as well as the IALA Dictionary, on the condition that the terms are consistent. Committee members were encouraged to continue to use the IALA Dictionary and update terms as required.

Action

The Secretariat is requested to implement the improved working procedures for the DWG.

10.18 Heritage Forum

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 discussed the details of the request made by the Korean Government to facilitate sending Fresnel lenses to Korea for the heritage exhibition in 2018. Guidance from the Secretariat is being sought and members will liaise with Korea intersessionally in order to develop the heritage aspects of the 2018 IALA Conference.

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 developed further at ENG6.

Action Item

The IALA Secretariat is requested to consider Liaison Note ENG5-11.1.20.

The IALA Secretariat is requested to forward Working Paper ENG5-11.2.11 to ENG6.

Members of the Heritage Forum are requested to seek clarification from Korea MOF on curatorial requirements and possibility of a cultural / educational program for heritage exhibition.

The Heritage Forum is requested to seek clarification on documentation supporting tenets of Incheon Declaration.

10.19 Reformatting of IALA Documentation

The Committee received eleven reformatted IALA documents from Mike Hadley, with some minor queries on content that were noted during reformatting. The Committee reviewed and updated the documents.

Action Item

The IALA Secretariat is requested to forward output papers ENG5-11.1.10, ENG5-11.1.11, ENG5-11.1.12, ENG5-11.1.13, ENG5-11.1.14, ENG5-11.1.15 and ENG11.1.16 to Mike Hadley.

11. REVIEW OF OUTPUT AND WORKING PAPERS

The Committee produced 24 output documents and 22 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?

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 Joules. On Thursday a closely fought football game matched WG1 and WG2 and ended in a drawn result.



It was noted that work is commencing on planning the work programme for the period 2014 -2022.

Action

Committee participants were requested to submit suggested work items for the work period 2018 – 2022.

13. REVIEW OF SESSION REPORT

The report of the meeting (ENG5-13.1) 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 ENG5 Committee report (ENG5-13.1) to Council to note.

14. DATE AND VENUE OF NEXT MEETING

It is expected that the 6th session of the ENG Committee (ENG6) will be from 27th to 31st March 2017 at IALA HQ.

The programme of work will include commencement of the review of WG outputs after lunch on Thursday. The programme will also include the soiree reception on Monday, the football match between WG1 and WG2 on Tuesday and the Committee dinner on Wednesday.

Action

The Committee Secretary is requested to include the lunchtime start of the Thursday plenary, the soiree, football match and Committee dinner on Monday, Tuesday and Wednesday respectively for ENG6.

15. CLOSING OF THE MEETING

The Secretary-General thanked the ENG participants and leaders for their hard work and achievements. He observed that Committee participants get inspired when engaging in IALA work and that he has seen IALA Recommendations and Guidelines on shelves all over the world. He noted that IALA is doing very well with increasing membership and many opportunities for change over the next few years. The Basic Documents are important for IALA and approved versions are now available on the IALA website. Progress towards IGO status in 2018 is being supported by the French Department of Foreign Affairs and it is hoped that the Incheon Convention will be signed at a diplomatic conference in 2018. He hoped the special Heritage Forum will be able to contribute to the 2018 IALA conference heritage display. The new IALA branding is being implemented in IALA documents and will be implemented in IALA HQ in the coming months. He noted the success of the Academy and the benefits of distance learning.

The Dean of the Academy noted that distance learning is open to all. He presented Academy certificates to David Jeffkins (modules 1, 2), Peter Dobson (modules 1, 2), Malcolm Nicholson (modules 1, 2), , Darpulju Collyea Gayan (modules 1, 2) and Simon Millyard (L1 Manager). Adam Hay passed modules 4 & 5.

The Chairman thanked all Committee Members for their commitment, good company and hard work during the week and noted the good progress with implementation of the workplan. He thanked those who had submitted input papers for their interesting and diverse contributions. He thanked the Vice Chair, Secretary, WG Chairs and Vice Chairs for their support and asked that the Committee's gratitude be passed to the Secretariat for their cheerful and courteous support.



He concluded by saying that all were invited to ENG6, 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.

5th Meeting of the AtoN Engineering and Sustainability Committee (ENG5)

The 5th meeting of the **AtoN Engineering and Sustainability Committee (ENG5)** will be held from 10 – 14 October, 2016 at IALA, St Germain en Laye, France.

The opening plenary will commence at 1330 on Monday 10 October and the closing plenary will end at approximately 1300 on Friday, 14 October.

Committee Chair, Vice-Chair and Working Group Chairpersons are requested to meet at 0900 on Monday, 10 October 2016.

AGENDA

1. Opening
 - 1.1. Approval of the agenda
 - 1.2. Welcome address xfrom 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 ENG4
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 62nd Session of the IALA Council 2016-06
 - 4.2. Report of the 31st Session of the IALA Policy Advisory Panel 2016-04
 - 4.3. Report on the 96th session of the IMO Maritime Safety Committee
 - 4.4. Report IALA WS on Shore-based Mar Services from Theory to Practical Use, Lisbon
 - 4.5. Report IALA Workshop on AtoN Services in Extremely Hot Climates
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	Ji-Min Yeo
5.6.	Developments in buoy moorings	Sipke Hoekstra
5.7.	Developments in remote control and monitoring	Peter Schneider
5.8.	IALA Dictionary	David Jeffkins
5.9.	IALA Bulletin liaison	David Jeffkins
6. Presentations (15 minutes duration)

6.1.	Brief on WWA	Stephen Bennett
6.2.	Visibility-Adaptive AtoN Light (VAAL)	Aivar Usk

- 6.3. Marine Signal Lights Service Conditions Factor Link Powell
- 6.4. implementation of AIS-Aton real and virtual on Antarctic zone Mariano Marpegan
- 6.5. An introduction to e-Navigation Alwyn Williams

- 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
HANSEN Greg	AMSA	Australia
LARSEN Leif Arne	Kystverket	Norway
COLLOCOTT James	SAMSA	South Africa

Working Group 1

Visual & Physical AtoN

	Members	Organisation / Country
1	Malcolm Nicholson (Chair)	Sealite, Australia
2	Frank Hermann (Vice Chair)	German Federal Waterways & Shipping Administration, Germany
3	Marcos Felipe Marinhos Moura	Centro De Sinalizacao Nautica Almirante Moraes Rego, Brazil
4	Aivar Usk	Cybernetica AS, Estonia
5	Partel Keskküla	Estonian Maritime Administration, Estonia
6	Donghee Lee	Daekee Marine Corporation, Republic of Korea
7	Horyeol Yun	Daekee Marine Corporation, Republic of Korea
8	Manuel Santos	Portuguese Lighthouse Authority, Portugal
9	Jorgen Royal Petersen	Danish Maritime Authority, Denmark
10	Andrew Zeller	Tideland Signal Corporation, USA
11	Juseop Han	Korea Association of Aids to Navigation, Republic of Korea
12	Jimin YEO	Korea Association of Aids to Navigation, Republic of Korea
13	Sigge Gustafsson	Swedish Maritime Administration, Sweden
14	Sami Lasma	Finnish Transport Agency, Finland
15	Alwyn Williams	General Lighthouse Authorities, R&RNAV, UK
16	Link Powell	General Lighthouse Authorities, R&RNAV, UK
17	Yves-Marie Blanchard	CEREMA, France

Working Group 2

Technical Knowledge & 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	Shaheen Mirza	MENAS, Bahrain
5	Eoghan Lehane	Commissioners of Irish Lights, Ireland
6	Mariano Luis Marpegan	Hidrovia S.A., Argentina
7	Ronan AUTRET	CEREMA, France

	Name	Organisation / Country
8	Yury Choi	Ministry of Oceans & Fisheries, Republic of Korea
9	Ho-Jin Lee	Ministry of Oceans & Fisheries, Republic of Korea
10	Michel Cousquer	CEREMA, France
11	Joel TOURBOT	Inter-regional Maritime Directorate (DIRM), France
12	Peter DOBSON	Trinity House Lighthouse Service, UK
13	Marco Krings	German Federal Waterways & Shipping Administration, Germany
14	Tony Taylor	Pharos Marine, UK
15	Stephanie Verbit	Canadian Coast Guard, Canada
16	Nicolos Fady	CEREMA, France
17	Jaafar Al Mutawa	MENAS, Bahrain
18	Simon Brooks	Australian Maritime Systems, Australia
19	Carlos Diez	Puerto del Estado, Spain
20	Jon Ki Un	Marine Transport Institute, Korea
21	Choe Kyong Ho	Shipowners Association, Korea
22	Andrew Mulhern	Northern Lighthouse Board, Scotland
23	Ikeda Tamotsu	JANA, Japan
24	Roslee Mat Yusof	Marine Department, Malaysia
25	Hong Si Xiong	The Navigation Guarantee Center of South China Sea, MOT, China
26	Liang Yang	China Maritime Safety Administration, China
27	Wayne Mykoo	Department of Marine Services and Merchant Shipping (ADAMS), Antigua & Barbuda
28	Darpulju Collyea Gayan	Liberia Maritime Authority, Liberia
29	Daniel Vililund	Pharos Marine, UK
30	Seppo Virtanen	SeaHow by Meditaito, Finland
31	Vincent Roget	GISMAN, France
32	Philippe Renaudin	CEREMA, France
33	Samir Benouda	Mobilis, France
34	Alan Cran	Northern Lighthouse Board, Scotland
35	Marisa Marco	Puerto Del Estado, Spain
36	Inguild Kragset	Norwegian Coastal Administration, Norway
37	Santiago Tortosa	Puertos Del Estado, Spain
38	Neil Jones	Trinity House, UK

ANNEX D LIST OF INPUT PAPERS

All papers were posted to the Committee website

Number	Input Paper Title	Source	Presented by / WG
ENG5- 1.2	Draft Agenda 20161010	IALA Secretariat	Simon Millyard
ENG5- 1.4	Programme for the week 20161001	IALA Secretariat	Simon Millyard
ENG5- 2.1	Action Items from ENG4	ENG2	Seamus Doyle
ENG5- 3.1	Input paper Committee template January 2016	IALA Secretariat	Simon Millyard
ENG5- 4.1	Final report Council 62.	IALA Secretariat	Simon Millyard
ENG5- 4.2.1	(PAP31-21.1) Draft report PAP31_V2	IALA Secretariat	Simon Millyard
ENG5- 4.2.2	Procedure for submission to the IMO MSC	IALA Secretariat	Seamus Doyle
ENG5- 4.2.3	ENG4-4.2.3 MSC-MEPC.1-Circ.4-Rev.4 - Guidelines On The Organization And Method Of Work Of The Maritime Safety Committee And The... (Secretariat) (1)	IALA Secretariat	Seamus Doyle
ENG5- 4.3	IMO MSC 96 report	IALA Secretariat	Mahdi Al Mosawi
ENG5- 4.4	(SBMS1-10.1) Report IALA WS on Shore-based Mar Services from Theory to Practical Use final.	Workshop on Shore-based Maritime Services	Seamus Doyle
ENG5- 4.5	(HC1-10.1) Report IALA Workshop on AtoN Services in Extremely Hot Climates - final	Workshop on AtoN Services in Extremely Hot Climates	Simon Millyard
ENG5- 5.1	Developments in Renewable Energy Sources	Peter Dobson	Peter Dobson
ENG5- 5.5	Draft IALA guideline on Operation and management for AtoN simulator 20161005	Jimin YEO	Jimin YEO
ENG5- 6.1	Academy brief to ENG5	Stephen Bennett	Stephen Bennett
ENG5- 6.2	Visibility-Adaptive AtoN Lights (VAAL) Cybernetica	Aivar Usk	Aivar Usk
ENG5- 6.3	Marine Signal Lights Service Conditions Factor	Link Powell	Link Powell
ENG5- 6.4	Implementation of AIS-Aton real and virtual on Antarctic zone	Mariano Marpeggan	Mariano Marpeggan
ENG5- 6.5	e-Navigation for Engineers	Alwyn Williams	Alwyn Williams
ENG5- 7.1	(ENG4-11.2.1) ENG Committee Workplan 2014-18 Updated at ENG4	ENG4	Simon Millyard
ENG5- 7.2	ENG Work Programme Task Register Updated at ENG4	ENG4	Simon Millyard
ENG5- 7.3	(PAP32-4.3.1) Normative and informative Recommendations.	PAP32	WG2 / WG1
ENG5- 7.4	Revised Standards diagram after LAP17+PAP32	PAP32	WG2 / WG1
ENG5- 7.5	IALA New Document structure3	Michael Card	Michael Card
ENG5- 9.1.1	IALA Guideline 1065 Ed.2 Vertical Divergence December 2013 rev3	Secretariat reformatting	WG1
ENG5- 9.2	(ENG4-11.2.20) Proposal re E106 on Retroreflecting material on AtoN Marks	ENG4	WG1

Number	Input Paper Title	Source	Presented by / WG
ENG5- 9.3	(ENG4-11.2.16) Draft Guideline 1038 on Methods and Ambient Light Levels for the Activation of AtoN lights	ENG4 reformatted	WG1
ENG5- 9.3.1	IALA Guideline 1038 Ed.2 Ambient Light Levels at which Aids to Navigation Lights should switch on and off May 2009	Secretariat reformatting	WG1
ENG5- 9.4	(ENG4-11.2.21) Draft Guideline on Leading Lines	ENG4 reformatted	WG1
ENG5- 9.5	(ENG4-11.2.22) Draft Recommendation on Marine Signal Lights Colours	ENG4 reformatted	WG1
ENG5- 9.6	(ENG4-11.2.23) Draft Recommendation on Luminous Range	ENG4 reformatted	WG1
ENG5- 9.7	(ENG4-11.2.24) Frame for Draft Guideline on Marine Signal Lights	ENG4 reformatted	WG1
ENG5- 9.8	(ENG4-11.2.25) Draft Guideline on Selection of Rhythmic Characters of Lights on AtoN	ENG4 reformatted	WG1
ENG5- 9.9	(ENG4-11.2.26) Draft Recommendation E-106	ENG4 reformatted	WG1
ENG5- 9.10	(ARM4-12.1.8) Liaison to ENG on draft Guideline on Rhythmic Characters	ARM4	WG1
ENG5- 9.11	(ARM4-12.1.9) Annex to liaison on the draft Guideline on Selection of Rhythmic Characters of lights on AtoN mb comments and edits.	ARM4	WG1
ENG5- 9.12	(ARM4-12.1.10) Liaison to ENG on Retroreflective Materials	ARM4	WG1
ENG5- 9.13	(ENG4-11.1.16) Liaison note ENG4 to ARM4 on Draft Guideline on Selection of Rhythmic Characters review	ENG4	WG1
ENG5- 9.14	(ENG3-11.2.15) WG1 Rec E-110 Ed4 Draft Rhythmic characters of lights on AtoN ENG2 notes 20150521	ENG3	WG1
ENG5- 9.15	(ENG4-9.18) Update E111 for Port Traffic Signals South Africa JamesC	ENG4	WG1
ENG5- 9.16	ENG5-9.16 Query re definition of Dictionary terms	DWG	WG1/ WG2
ENG5- 9.17	E-200-3 - IALA Recommendation E200-3 Proposal	Alwyn Williams	WG1
ENG5- 9.18.1	E-200-4 - Effective Intensity Cover Note	Alwyn Williams	WG1
ENG5- 9.18.2	E-200-4 - Recommendation E-200-4 draft	Alwyn Williams	WG1
ENG5- 9.18.3	E-200-4 - IALA Guideline xxxx - Determination and Calculation of Effective Intensity draft	Alwyn Williams	WG1
ENG5- 9.19.1	Service Conditions Factor Cover Note.	Link Powell	WG1
ENG5- 9.19.2	RPT-07-LP-16 Marine Signal Lights Service Conditions Factor	Link Powell	WG1
ENG5- 9.20	ENG4 Task41 - Conversion of E-200 for the new IALA strategy	Frank Hermann	WG1
ENG5- 9.20.1	draft Guideline on Intensity Calculations 20160915	Frank Hermann	WG1
ENG5- 9.20.2	draft Recommendation on Luminous Range	Frank Hermann	WG1
ENG5- 9.20.3	draft Recommendation on Colours	Frank Hermann	WG1
ENG5- 9.21.1	Cover Note for NAVGUIDE input on Retroreflective Material 20160923	Jørgen Royal Petersen	WG1
ENG5- 9.21.2	Summary of Recommendation E-106 for the NAVGUIDE 20160923	Jørgen Royal Petersen	WG1

Number	Input Paper Title	Source	Presented by / WG
ENG5- 9.22	IALA Guideline 1023 Ed.1.1 Design of Leading Lines December 2005 rev1	Secretariat reformatting	WG1
ENG5- 9.23	IALA Guideline 1043 Ed.1.2 Light Sources used in Visual AtoN December 2011 rev1	Secretariat reformatting	WG1
ENG5- 9.24	IALA Guideline 1073 Ed.1 Conspicuity of AtoN Lights at Night June 2011 rev2	Secretariat reformatting	WG1
ENG5- 9.25	Finnish Guidelines on Leading Lines-Pärtel.	Pärtel Keskküla	WG1
ENG5- 9.26	Russian guidelines on leading lines	Pärtel Keskküla	WG1
ENG5- 9.27	Report Multi-Light Distribution Korea KOPTI 2016-09-22 final	Jong-Uk Kim	WG1
ENG5- 9.28	Submission of Opinion for Elimination of Temporary Region in light Colour in Korea	Jong-Uk Kim	WG1
ENG5- 9.29	Light Test - Effects of Climate (Dust) on lenses and the degradation of intensity and range	Shaheen Mirza Ismaeel Ref Workshop on AtoN Services in Hot Climates	WG1
ENG5- 10.1.1	Queries re Guideline 1067-1	IALA Secretariat	WG2
ENG5- 10.1.2	(ENG4-11.2.13) Draft Guideline 1067-0 Ed2 on Selection of Power Systems for AtoN and Associated Equipment Apr2016 Rev3	ENG4 reformatted	WG2
ENG5- 10.1.3	(ENG4-11.2.14) IALA Guideline 1067-1 Ed.1 Total Electrical Loads of Aids to Navigation_May2009 Rev3	IALA Secretariat ENG4 reformatted	WG2
ENG5- 10.1.4	(ENG4-11.2.15) Draft Guideline 1067-2 Ed2 Power Sources_April2016 Rev2	ENG4 reformatted	WG2
ENG5- 10.1.5	(ENG4-11.2.17) IALA Guideline 1067-3 Ed.1 Electrical Energy Storage for AtoN May2008 rev2	IALA Secretariat ENG4 reformatted	WG2
ENG5- 10.2	IALA Guideline 1066 Ed.1.1 The Design of Floating Aid to Navigation Moorings Jun2010 rev3	IALA Secretariat	WG2
ENG5- 10.3	(ENG4-11.1.11) IALA Guideline 1098 Ed.1 on the Application of AIS AtoN on Buoys May 2013 rev4	IALA Secretariat	WG2
ENG5- 10.4	(ENG4-11.2.3) WG2 Sub Working Group Buoys and Moorings - Report & plan	ENG4	WG2
ENG5- 10.5	(ENG4-11.2.5) WG2 Task Group 4 (Heritage) Report April 2016	ENG4	WG2
ENG5- 10.6	(ENG4-11.2.6) Strategy for ENG Task Group 4 (formerly Heritage Forum)	ENG4	WG2
ENG5- 10.7	(ENG4-11.2.11) WG2 Sub Working Group Solar Model Comparison - Report & plan	ENG4	WG2
ENG5- 10.8	(ENG4-11.2.12) WG2 Sub Working Group Review of IALA Documents Power Systems - Report & plan	ENG4	WG2
ENG5- 10.9	(ENG4-11.2.19) WG2 Navguide Update Plan updated at ENG4	ENG4	WG2
ENG5- 10.10	(ENG4-11.2.4) WG2 Draft Guideline on Use of Modern AtoN Equipment in Heritage Lighthouses	ENG4 reformatted	WG2
ENG5- 10.11	(ENG4-11.2.7) Draft Guideline 1036 ed2 on Environmental Management	ENG4 reformatted	WG2

Number	Input Paper Title	Source	Presented by / WG
ENG5- 10.12	(ENG4-11.2.8) Draft Guideline on Commissioning	ENG4 reformatted	WG2
ENG5- 10.13	(ENG4-11.2.9) WG2 draft Guideline Maintenance of AtoN Structures	ENG4 reformatted	WG2
ENG5- 10.14	(ENG4-11.2.18) Draft Guideline 1092 Ed1 Safety Management for AtoN Activities 7Dec2012	ENG4 reformatted	WG2
ENG5- 10.15	(ARM4-12.1.5) Liaison to ENG on NAVGUIDE update	ARM4	WG2
ENG5- 10.16.1	(ARM4-12.1.7) Liaison to VTS and ENG on MSP (Marine Spatial Planning)	ARM4	WG2
ENG5- 10.16.2	(ARM4-12.1.6) Draft Guideline on Navigational Safety within MSP 20 APR 2016-1	ARM4	WG2
ENG5- 10.17	ENG5-10.17 (ARM4-12.1.11) Liaison to Secretariat on ENG NAVGUIDE update	ARM4	WG2
ENG5- 10.18	(ARM4-12.1.13) Liaison to ENG and WWA on NAVGUIDE update	ARM4	WG2
ENG5- 10.19	L2 Model Course Light Flashers Lamp changers and IPS lanterns Rev 0 Jan 13	WWA	WG2
ENG5- 10.20	L2 Model Course Lights and Marine Lanterns Rev 1 Jan 13	WWA	WG2
ENG5- 10.21	L2 Model Course on Rotating Beacons and Classic lenses Rev 2 Jan 13	WWA	WG2
ENG5- 10.22	L2 Model Course on Sound Signals	WWA	WG2
ENG5- 10.23	L2 Model Course on range, sector and precision direction lights Rev 1	WWA	WG2
ENG5- 10.24.1	Draft Guideline on Providing Aton Services In Extremely Hot And Humid Climates	Workshop on AtoN Services in Extremely Hot Climates	WG2
ENG5- 10.25	Report - performance of maritime Hybrid renewable energy system in Korea_juseopHan	Ju-Seop Han	WG2
ENG5- 10.26	IALA Guideline 1012 Ed.3 Protection of Lighthouses and other Aids to Navigation against Damage from Lightning May 2013 rev1	Secretariat reformatting	WG2
ENG5- 10.27	IALA Guideline 1035 Ed.2 Availability and Reliability of Aids to Navigation December 2004 rev1	Secretariat reformatting	WG2
ENG5- 10.28	IALA Guideline 1036 Ed.2 Environmental Management December 2013 rev1	Secretariat reformatting	WG2
ENG5- 10.29	IALA Guideline 1039 Ed.1 Designing Solar Power Systems for Aids to Navigation December 2004	Secretariat reformatting	WG2
ENG5- 10.30	IALA Guideline 1047 Ed.1 Cost Comparison Methodology of Buoy Technologies December 2005	Secretariat reformatting	WG2
ENG5- 10.31	IALA Guideline 1063 Ed.1 Agreements for Complementary use of Lighthouses Dec2008	Secretariat reformatting	WG2
ENG5- 10.32	IALA Guideline 1064 Ed1 Integrated Power Systems Lanterns Dec200	Secretariat reformatting	WG2
ENG5- 10.33	IALA Guideline 1076 Ed.1 Building Conditioning of Lighthouses December 2009 rev1	Secretariat reformatting	WG2
ENG5- 10.34	IALA Guideline 1006 Ed.3.1 Plastic Buoys December 2013	Secretariat reformatting	WG2

Number	Input Paper Title	Source	Presented by / WG
ENG5- 10.35	IALA Guideline 1007 Ed.1.1 Lighthouse Maintenance December 2005	Secretariat reformatting	WG2
ENG5- 10.36	IALA Guideline 1008 Ed.2 Remote Control and Monitoring June 2009	Secretariat reformatting	WG2
ENG5- 10.37	Report-Sea Test Result of plastic buoys-2	Ju-Seop Han	WG2
ENG5- 10.38	Proposal draft IALA Guideline on Operation and management for AtoN Simulator	Jong-Uk Kim	WG2
ENG5- 10.39	Report-Quality Certification according to enactment of the Korean Industrial Standards for Lanterns rev1	Jong-Uk Kim	WG2 / WG1
ENG5- 10.40	IALA NAVAID images for NAVGUIDE - copyright TH - 238Mb (only on File Share)	Neil Jones	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	Action
ENG5- 11.1.1	Proposal to revoke Recommendation E-105 on The Need to Follow National and International Standards	To Council
ENG5- 11.1.2	Draft L2 Model Course Light Flashers Lamp changers and IPS lanterns Ed1 Dec 2016	To Council
ENG5- 11.1.3	Draft L2 Model Course Lights and Marine Lanterns Ed1 Dec 2016	To Council
ENG5- 11.1.4	Draft L2 Model Course on Rotating Beacons and Classic lenses Ed1 Dec 2016	To Council
ENG5- 11.1.5	Draft Model Course on Sound Signals Ed1 Dec 2016	To Council
ENG5- 11.1.6	Draft Model Course on range, sector and precision direction lights Ed1 Dec 2016	To Council
ENG5- 11.1.7	Draft IALA Guideline on selection of rhythmic characters and synchronisation of lights for AtoN	To Council
ENG5- 11.1.8	Draft Guideline 1038 on Methods and Ambient Light Levels for the Activation of AtoN lights	To Council
ENG5- 11.1.9	Draft IALA Recommendation E-110 on Rythmic characters of lights on AtoN	To Council
ENG5- 11.1.10	Liaison Note to Mike Hadley regarding reformatted documents	To Mike Hadley
ENG5- 11.1.11	IALA Guideline 1012 Ed.3 Protection of Lighthouses and other Aids to Navigation against Damage from Lightning May 2013 rev1	To Mike Hadley
ENG5- 11.1.12	IALA Guideline 1035 Ed.2 Availability and Reliability of Aids to Navigation December 2004 rev1	To Mike Hadley
ENG5- 11.1.13	IALA Guideline 1047 Ed.1 Cost Comparison Methodology of Buoy Technologies December 2005	To Mike Hadley
ENG5- 11.1.14	IALA Guideline 1063 Ed.1 Agreements for Complementary use of Lighthouses Dec2008	To Mike Hadley
ENG5- 11.1.15	IALA Guideline 1064 Ed1 Integrated Power Systems Lanterns Dec200	To Mike Hadley
ENG5- 11.1.16	IALA Guideline 1008 Ed.2 Remote Control and Monitoring June 2009	To Mike Hadley
ENG5- 11.1.17	Liaison Note to ENAV Committee on VHF Range in different climatic conditions	To ENAV20
ENG5- 11.1.18	Liaison Note to ARM re NAVGUIDE updates	To ARM5
ENG5- 11.1.19	Query re definition of Dictionary terms1.	To DWG
ENG5- 11.1.20	Liaison Note to Secretariat regarding Fresnel Lenses for Korea 2018	To Secretariat
ENG5- 11.1.21	Draft Recommendation E-106 on Retroreflecting materials	To ARM5 To ENG6
ENG5- 13.1	Report on session 5 of the ENG Committee (ENG5)	To Council for noting

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

Number	Working Paper Title	Action
ENG5- 11.2.1	ENG Committee Workplan 2014-18 - updated at ENG5	To ENG6
ENG5- 11.2.2	ENG Work Programme Task Register - updated at ENG5	To ENG6
ENG5- 11.2.3	(ENG5-10.12) Draft Guideline on Commissioning	To ENG6
ENG5- 11.2.4	(ENG5-10.13) WG2 draft Guideline Maintenance of AtoN Structures	To Koblenz WS To ENG6
ENG5- 11.2.5	(ENG5-10.14) Draft Guideline 1092 Ed1 Safety Management for AtoN Activities 7Dec2012	To ENG6
ENG5- 11.2.6	(ENG5-10.10) WG2 Draft Guideline on Use of Modern AtoN Equipment in Heritage Lighthouses	To ENG6
ENG5- 11.2.7	(ENG5-10.11) Draft Guideline 1036 ed2 on Environmental Management	To ENG6
ENG5- 11.2.8	Draft Guideline on Providing Aton Services In Extremely Hot And Humid Climates 13 Oct.16	To ENG6
ENG5- 11.2.9		ENG6
ENG5- 11.2.10	Navguide Update Plan updated at ENG5	To ARM5 To ENG6
ENG5- 11.2.11	Strategy for ENG WG2 Task Group 4 (formerly Heritage Forum)	To ENG6
ENG5- 11.2.12	(ENG5-10.1.2) IALA Guideline 1067-3 Ed.1 Electrical Energy Storage for AtoN May2008 rev5	To ENG6
ENG5- 11.2.13	IALA Guideline 1073 Ed.1 Conspicuity of AtoN Lights at Night June 2011 rev2-WG1 working paper 20161012	To Koblenz WS
ENG5- 11.2.14	Guideline 1043 Ed.1.2 Light Sources used in Visual AtoN December 2011 rev1	To ENG6
ENG5- 11.2.15	IALA Guideline 1065 Ed.2 Vertical Divergence December 2013 rev3	To ENG6
ENG5- 11.2.16	(ENG5-10.4) WG2 Sub Working Group Buoys and Moorings - Report	To ENG6
ENG5- 11.2.17	Working Paper Summary of Recommendation E-106 for the NAVGUIDE	To ENG Vice Chair
ENG5- 11.2.18	(ENG5-10.1.2) Draft IALA Guideline 1067-0 Ed1.1 on Selection of Power Systems for AtoN and Associated Equipment Jun2011 rev3 - 12-10-16	To ENG6
ENG5- 11.2.19	(ENG5-10.1.3) IALA Guideline 1067-1 Ed.1 Total Electrical Loads of Aids to Navigation_May2009 rev3 - 13-10-16	To ENG6
ENG5- 11.2.20	(ENG5-10.1.4) Draft IALA Guideline 1067-2 Ed.1 Power Sources May2009 rev2	To ENG6
ENG5- 10.39	Report-Quality Certification according to enactment of the Korean Industrial Standards for Lanterns-rev1	To ENG7

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	6	<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		<input checked="" type="checkbox"/>	<input 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 checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Task delayed by 1 session
5.1.5	Review and Update E108 Ed 2 For the Surface Colours used as visual signals on aids to navigation	6	6		<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	3-5	<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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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"/>	
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
WG2 – Knowledge & Sustainability								
1.5.2.	Workshop on Lights and Batteries – IALABATT/IALALITE	1	6		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Workshop in March 2017
2.1.1.	Develop further guidance on plastic buoys, systems & sensors	1	6		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	To be continued at ENG6
2.1.2	Engineering guidance on the implementation of e-Navigation systems	3	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	To be continued at ENG6
2.2.1.	Develop guidance on sustainable AtoN design & maintenance.	3	6		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	To be continued at ENG6
2.2.2.	Develop guidance on the commissioning of AtoN equipment and systems and engineering audits.	2	5	6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	To be Finalised at ENG6.
2.3.1	Develop guidance on AtoN design & maintenance for hot climates.	4	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	To be continued at ENG6
2.3.2	Workshop on AtoN delivery and maintenance in extreme heat	3	4		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complete
2.4.1	Review and update guidance on safety of personnel	4	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	To be continued at ENG6
3.2.1.	Support the WWA in updating model courses on standards for training and certification of AtoN personnel	1	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.1.1.	Develop guidance on the use of heritage lighthouses for modern AtoN equipment & systems.	3	6		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposal Approved by Council
4.1.2.	Develop guidance on Maintenance of AtoN structures	2	6		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Scheduled for ENG4
5.1.1.	Navguide updates	3	6		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Commenced ENG1
5.1.2.	Review of IALA documents (ref ENG1 input paper on document ownership)	1	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Commenced at ENG3
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"/>	
5.3.2	Develop the IALA Wiki	1	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ongoing
5.3.3	Develop the IALA Dictionary	1	7		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ongoing

Action Items for Secretariat

1. The Secretariat is requested to forward the revised ENG Committee Workplan, ENG5-11.2.1, to ENG6. 10
2. The Secretariat is requested to forward the revised ENG Work Programme Task Register for 2014-2018, ENG5-11.2.2, to ENG6. 10
3. The Secretariat is requested to forward the Draft Guideline on the Selection of Rhythmic Characters and Synchronisation of Lights on AtoN, paper ENG5-11.1.7, to Council for approval. 11
4. The Secretariat is requested to forward ENG5-11.1.8 Draft Guideline on Methods and Ambient Light Levels for the Activation of AtoN Lights to Council for approval. 11
5. The Secretariat is requested to forward the working papers ENG4-11.2.22, ENG4-11.2.23 & ENG4-11.2.24 to ENG6. 11
6. The Secretariat is requested to forward ENG5-11.1.21 the Draft Recommendation E-106 Retroreflecting Material to ARM5 and ENG6. 12
7. The Secretariat is requested to forward ENG5-11.1.9, Recommendation E-110 Ed4 Draft Rhythmic characters of lights on AtoN to Council for approval. 12
8. The Secretariat is requested to forward the input paper ENG5-9.15 to ENG6. 12
9. The secretariat is requested to forward working paper ENG5-11.2.14 to the IALABATT/LITE Workshop in Koblenz. 13
10. The Secretariat is requested to forward working paper ENG5-11.2.15 to ENG6. 13
11. The secretariat is requested to forward working paper ENG5-11.2.13 to the IALABATT/LITE Workshop in Koblenz. 13
12. The Secretariat is requested to remove the annexes of Guideline 1069 on the Synchronisation of Lights and put them on the IALA Wiki. 13
13. The Secretariat is requested to arrange for IALA Guideline 1069 on the Synchronisation of Lights to be revoked as the relevant information has been captured in the new Guideline on Selection of Rhythmic Characters and Synchronisation of Lights for AtoN (ENG5-11.1.7). 14
14. The IALA Secretariat is requested to forward working paper ENG5-11.2.9 to ENG6. 14
15. The IALA Secretariat is requested to forward working paper ENG5-11.2.7 to ENG6. 15
16. The IALA Secretariat is requested to forward working paper ENG5-11.2.3 to ENG6. 15
17. The IALA Secretariat is requested to forward working paper ENG5-11.2.8 to ENG6. 15
18. The IALA Secretariat is requested to forward working paper ENG5-11.2.5 to ENG6. 15
19. The IALA Secretariat is requested to review the style of the title page of each model course and ensure that the title is consistent with the table in E-141. 16
20. The IALA Secretariat is requested to forward output papers ENG5-11.1.2, ENG5-11.1.3, ENG5-11.1.4, ENG5-11.1.5 and ENG5-11.1.6 to the IALA Council for approval. 16
21. The IALA Secretariat is requested to forward working paper ENG5-11.2.6 to ENG6. 16
22. The IALA Secretariat is requested to forward working paper ENG5-11.2.4 to ENG6. 16
23. The IALA Secretariat is requested to forward Liaison Note ENG5-11.1.18 to the ARM Committee. 16
24. The IALA Secretariat is requested to forward Working Paper ENG5-11.2.10 to the ARM Committee. 17
25. The IALA Secretariat is requested to forward Working Paper ENG5-11.2.10 to ENG6. 17

26. The IALA Secretariat is requested to forward Working Papers ENG5-11.2.9, ENG5-11.2.12, ENG5-11.2.18, ENG5-11.2.19 and ENG5-11.2.20 to the IALABATT workshop in Koblenz. 17
27. The IALA Secretariat is requested to withdraw Guideline 1011 on a Standard Method for Defining and Calculating the Load Profile of Aids to Navigation from the IALA website as this document was replaced by Guideline 1067. 17
28. The Secretariat is requested to implement the improved working procedures for the DWG. 17
29. The IALA Secretariat is requested to consider Liaison Note ENG5-11.1.20. 18
30. The IALA Secretariat is requested to forward Working Paper ENG5-11.2.11 to ENG6. 18
31. The IALA Secretariat is requested to forward output papers ENG5-11.1.10, ENG5-11.1.11, ENG5-11.1.12, ENG5-11.1.13, ENG5-11.1.14, ENG5-11.1.15 and ENG11.1.16 to Mike Hadley. 18
32. The Secretariat is requested to forward the ENG5 Committee report (ENG5-13.1) to Council to note. 19
33. The Committee Secretary is requested to include the lunchtime start of the Thursday plenary, the soiree, football match and Committee dinner on Monday, Tuesday and Wednesday respectively for ENG6. 19

Action Items for Members

34. David Jeffkins is requested to upload input papers ENG5-10.25, 10.27 to the IALA Wiki. 7
35. The Chair of the ENG Committee is requested to consider a Guideline for comprehensive AtoN Simulation including existing AtoN Simulation Guidelines such as Guidelines 1058 and 1097 and Recommendation O-138 should be added and processed as a new work item in the 2018 – 2022 work programme and that an independent manual for operation of AtoN Simulator be included in the 2018 – 2022 work plan. 8
36. Committee Members are requested to ensure that definitions in IALA documents are consistent with the Dictionary. 9
37. ENG Committee members are requested to submit articles for the IALA Bulletin to Marie-Helene Grillet. 9
38. Malcolm Nicholson is requested to provide a new fig1 for insertion in ENG5-11.1.8 prior to submission to Council. 11
39. Alwyn Williams is requested to provide input to ENG6 on draft Recommendation E-200-3 Measurement. 12
40. Frank Hermann is requested to provide input to ENG6 on Draft Recommendation E200-2 Luminous Range. 12
41. Dave Jeffkins is requested to put the content of the working paper ENG5-11.2.17 on summary of retroreflectors for the NAVGUIDE to the Wiki NAVGUIDE. 12
42. Jorgen Royal Petersen, Sami Lasma and Sigge Gustafersson are requested to work intersessionally on the new Guideline on Retroreflectors and submit an input paper to ENG6. 12
43. ENG Committee Members are requested to submit input papers in support of the revision of Recommendation E-111 on Port Traffic Signals. 12
44. Frank Hermann, Yves-Marie Blanchard and Partel Keskkula are requested to work intersessionally on the new Guideline for Leading Lines and provide an input paper to ENG6. 13
45. Frank Hermann and Yves Marie Blanchard are requested to update the existing Excel spread sheet and then input to ENG6. 13

46.	Members are requested to input presentations to future ENG meeting on topics of interest to the Committee.	14
47.	Committee participants are requested to note the proposed dates for the 2017 Workshop on Sustainable Light & Power for the next generation in Koblenz, Germany.	14
48.	Committee participants were encouraged to register for the Workshop on Sustainable Light & Power for the next generation in Koblenz from 20 th to 24 th March 2017.	14
49.	Committee Members 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 ENG6.	14
50.	Committee Members 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 ENG6.	15
51.	Committee members are requested to review working paper ENG5-11.2.7 and also provide any relevant information they may have with regard to environmental management to ENG6.	15
52.	Members are requested to review working paper ENG5-11.2.3 and provide feedback to ENG6.	15
53.	The IALA Secretariat is requested to forward Liaison Note ENG5-11.1.17 to the ENAV Committee.	15
54.	Committee Members are requested to provide input to ENG6 on any relevant experience with the use of modern AtoN equipment and systems in heritage lighthouses.	16
55.	Committee Members are requested to review working paper ENG5-11.2.4 on Maintenance of Aton Structures and provide feedback or information on maintenance systems or processes in their respective organisations to ENG6.	16
56.	Members are requested to submit updated photos and illustrations for the NAVGUIDE to ENG6	17
57.	Members of the Heritage Forum are requested to seek clarification from Korea MOF on curatorial requirements and possibility of a cultural / educational program for heritage exhibition.	18
58.	Committee participants were requested to submit suggested work items for the work period 2018 – 2022.	18



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