



Report of the 3rd Session of the IALA ENG Committee

16 to 20 November 2015

Executive Summary

The third meeting of the ENG Committee (ENG3) was held from 16th to 20th November in IALA HQ.

Despite the tragic terrorist attacks in Paris on 13 November 2015, 48 participants from 26 countries attended ENG3, of which 34 were National Members, 6 were Industrial Members, 4 were Associate Members, one was an observer. Six members attended for the first time.

The Committee considered 59 input papers and produced 13 output documents and 16 working papers including and 5 Academy model courses and the overview of Level 2 AtoN technician training.

Carlos Calvo Gómez, Fernando Romero Noreña, Bob McIntosh and Jean-Marie Calbet were approved as AtoN experts in the Academy.

Good progress has been made on preparing for the workshop on sustainable light & power for the next generation in Koblenz in March 2017 while approval from the host country is awaited for the workshop on the challenges of providing AtoN services in extremely hot climates in September 2016.

The work of transforming the IALA product line continued, focussing on merging and updating existing guidance documents on buoys, power systems and maintenance of AtoN structures into a number of streamlined Recommendations and Guidelines to support the proposed IALA Standards structure.

A significant revision of the existing IALA guidance on sector was lights was completed with the incorporation of guidance on modern LED sector lights, including updated design, measurement and installation procedures.

A revised process for updating the IALA Dictionary was developed with the establishment of a Dictionary Working Group consisting of committee Chairs and Vice Chairs from the four IALA Technical Committees and administrative support from the IALA secretariat.

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 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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All tasks progressing per current plan
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
Across all domains	18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Task 5.2.1 removed All tasks progressing per current plan except task 5.1.3 and task 5.1.11 which are each delayed by one session.

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ENG Committee

3rd Session

20 November 2015

Report of the 3rd Session of the IALA ENG Committee

GENERAL

The 3rd session of the AtoN Engineering and Sustainability Committee (ENG) was held from 16 to 20 November 2015 at IALA. The Chairman was Simon Millyard and the Vice Chairman was David Jeffkins. The Secretary for the meeting was Seamus Doyle.

1 INTRODUCTION

The IALA Secretary General, Francis Zachariae, welcomed everyone to ENG3. He offered sincere condolences to all the victims of the tragedy in Paris on 13 November 2015 which were reported to have effected people from 11 countries. A minutes silence was observed in sympathy with all those effected by this horrifying event.

Mr Zachariae provided an update on the Change of Status project noting that the draft convention text had been agreed by the COS Advisory Group for submission to the IALA Council and then submission to the French Foreign Ministry. The project is on track for ratification at a diplomatic conference in 2018 in Korea. He advised that Industrial Members will continue as IALA members, noting the precedent of the World Tourist Organisation. He introduced new IALA Secretariat members Mahdi Al-Mosawi and Audrey Guinault.

Recalling the IALA Strategic Vision, the IALA Deputy Secretary General, Michael Card, briefed the meeting on progress in developing a draft IALA Standards plan for submission to Council 61 and on the new branding image of IALA which will be implemented on 1 January 2016. He encouraged ENG participants to refer to the IALA Dictionary rather than inserting glossaries when preparing IALA documentation. Formal coordination between the ENAV and VTS Committees has commenced in relation to e-navigation data provision. IMO meetings will be attended by either the Secretary General or Deputy Secretary General while ENAV participants Jon Leon Ervik and Pieter Paap will assist where required.

1.1 Administration and safety brief

Virginia Butler provided a Safety and Administration briefing.

1.2 Approval of the Agenda

The agenda (ENG3-1.2) was adopted.

1.3 Introductions and Apologies

The list of Committee Members who attended ENG3 is shown in ANNEX B. The Committee noted apologies from Members who were unable to attend as noted in ANNEX B.

Spanish participants in the Level 1 AtoN Managers course were congratulated on their success in being awarded Level 1 Certificates in Aids to Navigation Management.



1.4 Programme for the week

The programme for the week, paper ENG3-1.4, was approved.

2 REVIEW OF ACTION ITEMS FROM ENG2

Input paper ENG3-2.1 refers. Action items for the IALA Secretariat from ENG2 were noted as complete except for action 10, “the Secretariat is requested to review potential improvements to accessing to the CALMAR software via the IALA web site, which is part of the IALA website update project” which is on-going. Council decisions on relevant output papers are awaited following Council Session 61 in December 2015. WG chairs were requested to review Members actions.

Action

The IALA Secretariat is requested to continue work on improving access to the CALMAR software.

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 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?

3.2 Identify input papers suitable for uploading to the IALA Wiki

David Jeffkins demonstrated the IALA Wiki. The following papers were identified as suitable for retention on the IALA Wiki.

- ENG3-9.5 – Optical filter material for marine signal lights;
- ENG3-9.6 – Use of optical filter materials with different light sources;
- ENG3-10.8 – Trinity House commissioning of AtoN equipment and systems;

- ENG3-10.10 – Problems of mounting AIS AtoN aerial systems on buoys;
- ENG3-10.17 – Information on maximum power point tracking (MPPT) solar regulators.

Action

David Jeffkins is requested to upload input papers ENG3-9.5, ENG3-9.6, ENG3-10.8, ENG3-10.10, and ENG3-10.17 to the IALA Wiki.

4 REPORTS FROM OTHER BODIES

4.1 Reports from IALA Council – 60th Session

The Committee noted the report of the 60th Session of the IALA Council held in Kuala Lumpur, Malaysia, from 26th to 29th May 2015, paper ENG3-4.1 refers.

4.2 Report of PAP29, May 2014

The Committee noted the report of the 29th Session of the IALA Policy Advisory Panel (PAP29) held in IALA HQ from 15th to 17th June 2015, paper ENG3-4.2 refers.

4.3 PAP30, 12 to 13 November 2015

Simon Millyard reported on issues from PAP30 which were relevant to the work of the ENG Committee, with reference to the IALA change of status project, IALA branding, the Basic Documents, patent policy and IALA Standards definition.

5 REPORTS FROM RAPPORTEURS

5.1 Developments in Renewable Energy Sources

Peter Dobson described a new development in renewable energy power generation from a company in the UK called WITT. This development captures the energy of random motion through the use of a pendulum and gearbox to provide an electrical output. He noted that this unit is about two years away from being commercially available. Input paper ENG3-5.1 refers.

5.2 Developments in Battery Technology

Jonas Lindberg presented a report on developments of lead crystal batteries. Trinity House is about to test and trial a new type of Lead Acid battery. The manufacturer, Betta Batteries, uses the name Lead Crystal Battery. In comparison to conventional types of lead acid batteries the lead crystal battery it is claimed to have a number of advantages, including tolerance of deeper discharge, greater cycle life (also in extreme temperatures) and a longer service life. They recover to full rated capacity over and over again.

A more detailed presentation of this battery type is planned for ENG4 which will include results from the Trinity House tests.

5.3 Developments in New Light Sources

Malcolm Nicholson noted developments in metal halide lamps with longer life, higher light output and reduced energy consumption.

5.4 CIE-IALA Liaison

Malcolm Nicholson reported on the 28th CIE Session in the International Year of Light from 29th June to 4th July 2015. He noted interest of IALA in CIE Division 1 (Vision and Colour), Division 2 (Measurement of Light and Radiation) and Division 4 (Lighting and Signalling for Transport). A third type of “cone” photo-receptors in the human eye was highlighted which may have significance for IALA in the future. IALA guidance on switching light levels was used by CIE. An input to CIE on validation of the use of zero-length photometry in the Goniophotometry of solid-state lighting

devices was produced on the back of the author promoting the benefits of light measurement capability at IALA. CIE were quite interested in work carried out in the UK on the apparent intensity of a flashing light. Paper ENG3-5.4 refers.

5.5 Developments in AtoN Simulation Systems

Rapporteur was unable to report.

5.6 Developments in buoy moorings

Rapporteur was unable to report.

5.7 Developments in remote control and monitoring

Nothing of significance to report.

5.8 IALA Dictionary

A short demonstration of IALA Dictionary was presented. The need to ensure that the IALA Dictionary is maintained up to date was noted. It was suggested that the Working Groups should extract terms when preparing or amending IALA Recommendations and Guidelines and verify that the terms are included accurately in the Dictionary.

A revised process for updating the IALA Dictionary was developed with the establishment of a Dictionary Working Group consisting of Committee Chairs and Vice Chairs from the four IALA Technical Committees, the Committee Secretaries and administrative support from the IALA Secretariat.

5.9 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 is expected in December 2015.

Action

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

6 PRESENTATIONS

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

6.1 IALA World-Wide Academy (WWA) – Gerardine Delanoye

Input paper ENG3-6.1 refers. Gerardine Delanoye described the recent activity in the Academy since ENG2, including the delivery of Level 1 Manager courses in French, Spanish and English and the significant success in reducing the number of target states. She outlined Academy work for ENG3 and plans up to ENG4.

6.2 Installation of Coastal Monitoring Stations in PNG – Adam Hay

Adam Hay described the installation of coastal monitoring stations in Papua New Guinea. Each Coastal Monitoring Station consists of a number of key sensors installed on an existing marine Aids to Navigation (AtoN) structure. The sensors include an AIS Base Station, radar, CCTV, security camera and a weather station with satellite communications. He described the significant challenges encountered and overcome during the project. Input papers ENG3-6.2 and ENG3-6.2.1 refer.

In discussion it was noted that the initial solar systems were found to be inadequate due to unanticipated effects of cloud cover. The radar operates all the time with the video processed on-station and only the video is sent to shore station. Vandalism was a major problem and solutions were developed on a case by case basis. Local labour engagement during station construction was a

major benefit to getting local acceptance.

Nawae Construction was thanked for sponsoring a L1 course participant from Solomon Islands.

6.3 Beyond FFL: Rhythmic Character for Range Estimation – Aivar Usk

Changing from rotary optics and incandescent light sources to LEDs has resulted in a change from historical slow rise times of AtoN light flash pulses to rectangular shaped LED light flashes. While the conspicuity of such sharp light flashes with very short rise and fall times of luminous intensity is definitely higher, the ability of observing mariners to estimate the approximate range of such AtoN lights at longer range by perceived flash length is lost. Implementing controlled slow flash rise time for flashing LED light signals is proposed in order to return range estimation capability where required, while also helping identification of such lights at close range. The points were demonstrated on a hand-held unit with adjustable flash profiles.

In discussion it was noted that sloping the flash leading edge may reduce conspicuity but there is a trade-off with the other benefits of a non-square flash. Tests to date have been short range and participants were invited to conduct long range tests of the concept. The GLR R&Rav plan to conduct trials on 9 to 10 December 2015 to investigate Gaussian flash profiles compared with rotating light flashes.

6.4 Development of a simulator for aids to navigation

Via a pre-recorded video, Hiroyuki Nakajima made presentation on the development of a simulator for aids to navigation. Recalling that Nippon Koki Kogyo was established in 1919, they commenced producing LED lights in 1988. He described the AtoN simulator which uses virtual reality to simulate the performance of AtoN lights. All major parameters of AtoN lights such as height, intensity, light source, flash character and type are adjustable. Further development of the simulator is planned. He appealed for feedback from ENG participants.

7 REVIEW OF WORK PROGRAMME AND WG EXPECTATIONS

7.1 Work Programme

The ENG Committee Workplan, was updated to include relevant work from the Heritage Forum which will be absorbed into WG2. Progress notes were added. Paper ENG3-11.2.1 refers.

The Committee Terms of Reference on the IALA Wiki were updated to include inclusion of relevant aspects of the Heritage Forum in WG2. Paper ENG3-11.2.3 refers.

The ENG Work Programme Task Register for 2014-18, ENG2-7.2, was reviewed and updated.

The

Action

The Secretariat is requested to forward the revised ENG Committee Workplan, ENG3-11.2.1, to ENG4.

The Secretariat is requested to forward the revised ENG Work Programme Task Register for 2014-2018, ENG3-11.2.2, to ENG4.

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 continued on the new Guideline entitled ‘Selection of Rhythmic Characters’ taking into account information from 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 ENG3-11.2.16 Draft Guideline on the Selection of Rhythmic Characters of Lights on AtoN to ARM3 & ENG4.

The Secretariat is requested to forward Liaison Note ENG3-11.1.9 to ARM3.

Members of the task group are requested to identify further work items to contribute to the Draft Guideline on the Selection of Rhythmic Characters of Lights.

GLA R&RNAV are requested to provide input to ENG4 on the results of trials pertaining to minimum flash duration and maximum eclipse times.

Pärtel Keskküla is requested to provide input to ENG4 on the maximum eclipse time for group flashing lights.

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

Work progressed 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 are still valid.

Action Items

The Secretariat is requested to forward ENG3-11.2.17, Draft Guideline 1038, to ENG4.

Members of the task group are requested to identify further work items to contribute to the revision of Guideline 1038.

Sigge Gustafsson is requested to provide an input paper to ENG4 on the SMA experiences with AtoN AIS detection by vessels for switching AtoNs on/off of.

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 ENG and ARM Committees. The Committee provided updates as 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 was due to commence at ENG3. However, no input papers were received on this topic. Members are requested to provide input papers to ENG4.

Action Item

Frank Hermann and Fernando Romero are requested to work intersessionally on the revision of E200-2 and provide an input paper to ENG4.

Malcolm Nicholson is requested to provide input to ENG4 on the revision of E200-4.

Yves-Marie Blanchard is requested to provide input to ENG4 on the revision of E200-5.

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)

This task is due to commence at ENG4.

Action Item

Sigge Gustafsson and Jorgen Royal Petersen are requested to provide input to ENG4 on the revision of Recommendation E-106.

9.9 Review and Update Recommendation E108 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 has begun on updating Recommendation E-110.

Action Item

The Secretariat is requested to forward ENG3-11.2.15, Recommendation E-110 Ed4 Draft Rhythmic characters of lights on AtoN ENG2 notes 20150521, to ENG4.

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

This task is due to commence at ENG4.

Action Item

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 has been brought forward to commence at ENG3. No input papers were received on this topic, hence the revision will commence at ENG4.

Action Item

Members are requested to familiarise themselves with the documents relating to Recommendation E-112 for Leading Lights and Guideline 1023 for the design of leading lights and provide input papers to ENG4 to support the update.

Bob Trainor is requested to submit the USCG revised leading lines calculator by end of January 2016 in order that Frank Hermann and Yves-Marie Blanchard may analyse the content in preparation for ENG4.

Sami Lasma is requested to input the Finnish leading line calculator to ENG4.

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.

9.14 Update 1041 on Sector Lights (Task 5.1.10)

The Committee finished their review and update of Guideline 1041 on Sector Lights.

Action Item

The Secretariat is requested to forward ENG3-11.1.1, Draft IALA Guideline 1041 On Sector Lights, to Council for approval.

The Secretariat is requested to submit new terms used in ENG3-11.1.1, Draft IALA Guideline 1041 On Sector Lights to the IALA Dictionary updating process.

The Chair/ Vice Chair of ENG Committee are requested to consider if a Recommendation on Sector Lights based on section 5.1 of ENG3-11.1.1, Draft IALA Guideline 1041 On Sector Lights, is required.

9.15 Update 1061 Illumination of Structures (Task 5.1.11)

The revision of this Guideline has not progressed as envisaged. An additional session will be required to complete this work.

Action Item

Malcolm Nicholson is requested to work on Guideline 1061 on Illumination of Structures intersessionally and submit an input to ENG4.

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

Task is due to start at ENG6.

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

Task is due to start at ENG5.

9.18 Identify current documents as potential Standards, Recommendations, Guidelines & Manuals (Task 5.1.14)

This task has changed in lieu of IALA Strategy.

9.19 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) are well advanced.

The draft technical programme was updated and ENG participants were requested for assistance in identifying potential presenters amongst member organisations.

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.

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

Communication with CALMAR regarding the availability of their updated software and manual for the design of buoy moorings is ongoing.

Work on the proposed Buoy Guidelines continued, developing working paper ENG 3-10.6.

The existing Guideline 1006 was reviewed, amended and updated, with specific emphasis on the polyethylene based plastic buoys. New chapters and information were added.

Action Item

The IALA Secretariat is requested to forward working papers ENG3-11.2.10 and ENG3-11.2.12 to ENG4.

Committee Members are requested to provide information or input to ENG4 regarding the use of plastic buoys in hot climate and high UV exposure environments, power supply for buoys, especially battery technology (decreasing the size) and remote control technologies.

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

The Committee noted input paper ENG 3-10.10, detailing problems of mounting AIS AtoN aerial systems on buoys and added it to the IALA Wiki.

Additional information is expected to be forthcoming in future sessions regarding the transmission of meteorological data via AIS and this may be a topic of interest under this work item.

The Committee considered the request from the ENAV Committee to review and provide comments on the draft Guideline on User Requirements for VHF Data Exchange System (VDES). As there was limited relevant expertise in this subject at ENG3, Members were asked to seek relevant expertise within their own organisations and provide feedback directly to ENAV18.

The Committee notes input paper ENG3-10.26.1 from the ENAV Committee and the information

pertaining to PNT relevant data and its role in the development of VDES documentation.

Action Item

Committee members are requested to provide any information they may have on interfacing technology with AtoN systems and submit as input to ENG4.

Committee members are requested to seek relevant expertise within their own organisations to assist with the review of Input Paper 3-10.26.1, Liaison note re draft Guideline on VDES User Requirements, and to forward any feedback directly to ENAV18.

The Secretariat is requested to forward paper ENG3-11.1.11 to the ENAV Committee.

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

The Committee noted input paper ENG3-10.27 (revision of Guideline 1036 Environmental Management) and ENG3-10.28 (a summary of the revisions in ENG3-10.27).

Further revision on Guideline 1036 was undertaken, including a general review of the existing content, the document format and the inclusion of additional content in a number of sections.

Action Item

The IALA Secretariat is requested to forward working paper ENG3-11.2.4, Guideline 1036 ed2 On Environmental Management 20151118, to ENG4.

Committee Members are requested to review the working paper ENG3-11.2.4, Guideline 1036 ed2 On Environmental Management 20151118 and provide input to ENG4.

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 Commissioning continued.

Action Item

The IALA Secretariat is requested to forward working paper ENG3-11.2.5 and ENG3-11.2.6 to ENG4.

Members are requested to provide input papers to ENG4 on commissioning of AtoN in their respective countries.

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

No further work was undertaken on the new Guideline on AtoN design & maintenance for hot climates at ENG3. Work is scheduled to commence at ENG5 after the ‘Workshop on AtoN delivery and maintenance in extremely hot climates’.

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

Preparation for the Workshop on AtoN delivery and maintenance in extremely hot climates from 4th– 7th September 2016 is progressing. The venue for the workshop is to be confirmed.

Action Item

Committee Members are requested to note the proposed dates for the Workshop on the challenge of providing AtoN services in extremely hot climates.

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

The content of Guideline 1092 on Safety Management remains recent and relevant and the task register was updated for this task to start at ENG4.

Action Item

Committee members are requested to submit details of relevant safety systems, policies, documented procedures or other issues related to safety of personnel to ENG4.

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 Recommendations of Guidelines were received as input for ENG3.

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 ENG3-10.20 (L2 Model Course on Aton Service Craft and Buoy Tenders), ENG3-10.21 (L2 Model Course on Introduction to Aton Buoyage), ENG3-10.22 (Level 2 Model Course on Introduction to Radionavigation and DGNSS), ENG3-10.23 (L2 Model Course on Maintenance of Mercury Rotating Optics), ENG3-10.24 (L2 Model Course on Racons) and ENG3-10.25 (L2 Model Course overview) were completed for submission to Council for approval.

Action Item

The IALA Secretariat is requested to forward output papers ENG3-11.1.2, ENG3-11.1.3, ENG3-11.1.4, ENG3-11.1.5, ENG3-11.1.6 and ENG3-11.1.7 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)

The Committee developed a draft outline for a Guideline on the use of heritage lighthouses for modern AtoN equipment & systems.

Committee Members were asked to contribute input on any experience they may have had with the use of modern AtoN equipment and systems in heritage lighthouses.

Action Item

The IALA Secretariat is requested to forward working paper ENG3-11.2.13 to ENG4.

Committee Members are requested to provide input to ENG4 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)

Input papers ENG3-10.2 and ENG3-10.9 refer. Draft Guideline on maintenance of AtoN structures was developed into a further draft Guideline.

Action Item

The IALA Secretariat is requested to forward working paper ENG3-11.2.5 and ENG23-11.2.6 to ENG4.

Committee Members are encouraged to review working paper ENG3-11.2.5 on maintenance of AtoN structures and provide feedback or information on maintenance systems or processes in their respective organisations to ENG4.

10.13 Navguide updates (Task 5.1.1)

Chapter 3 of the Navguide was reviewed on the IALA Wiki. Suggestions on a revised layout were made to improve the way information is presented in the document.

The Navguide Update Plan was updated to reflect progress made at ENG3. A Liaison Note, ENG 3-11.1.8, was sent to the ARM Committee to provide details on the changes suggested by the ENG Committee.

Action Item

The IALA Secretariat is requested to forward Liaison Note ENG3-11.1.8 to the ARM Committee.

The IALA Secretariat is requested to forward Working Paper ENG3-11.2.7 to ENG4.

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

Input papers ENG 3-10.3, 3-10.16, 3-10.17 and 3-10.18 were reviewed, with a goal of validating the suitability of the IALA solar model as a suitably ongoing IALA tool. The comparison confirmed that for both large (lighthouse) and small (buoys) solar sizing designs, the IALA model provided similar answers to that of other models. It was therefore felt that the IALA solar model should have some small improvement, but that it should remain a simple dedicated solar calculator. Some additional design hints are to be added to Guideline 1039 to aid the user in achieving an effective design and in interpreting the results. Work on this task will continue at ENG4.

Guideline 1006 was reviewed in conjunction with Task 2.1.1, on development of further guidance for plastic buoys, systems and sensors.

The development on the new Guideline on maintenance of AtoN structures continued with a review of all documents that make reference to maintenance of structures. This task is being undertaken in conjunction with Task 4.1.2.

Action Item

The IALA Secretariat is requested to forward Working Papers ENG3-11.2.8 and ENG3-11.2.9 to ENG4.

10.15 Response to ARM on Disaster Recovery Planning

The Committee reviewed input paper ENG3-10.13 from the ARM Committee requesting feedback on a new Guideline being developed on disaster recovery planning and responded in liaison note ENG3-11.1.10.

Action Item

The IALA Secretariat is requested to forward liaison note ENG3-11.1.10 to the ARM Committee.

10.16 Heritage Forum

After discussion at PAP30 and in ENG3, it was agreed to merge relevant work of the Heritage Forum into WG2 from ENG4. This will take the form of a Task Group in WG4 which will be led by Neil Jones. The updated Terms of Reference for WG2 to reflect this change are on the IALA Wiki. The work on heritage items will be focussed around the productive asset management of former lighthouses and associated estate for the benefit of Authorities who are required to maintain them.

The Committee expressed its thanks to Bob McIntosh for his many years of service to the Committee and the Heritage Forum.

11 REVIEW OF OUTPUT AND WORKING PAPERS

Output papers were reviewed and their disposition agreed as indicated in ANNEX E.

12 ANY OTHER BUSINESS

It was noted that there are instances of senior ships captains who profess to be unaware of AIS and want more lights rather than electronic AtoN.

The Deputy Secretary General recalled the ITU WRC which was in progress at the time of ENG3, noting that efforts to secure frequencies for satellite VDES were unsuccessful despite the many benefits. Additional terrestrial VHF allocations were agreed, addressing the risk of congestion on AIS 1 and 2 frequencies. He noted the assistance of WSV and Stefan Bober with thanks.

The Deputy Secretary General noted the proposal for seven IALA Standards to be submitted to Council 61. Manuals such as the Heritage Manual, the VTS Manual and the Navguide are available. The VTS Manual is referenced in IMO SOLAS Chapter XII while the IALA Maritime Buoyage System (MBS) is referenced in IMO SOLAS Chapter V. Although there is no IALA Recommendation on the MBS there was an international agreement in 1982 which, with SOLAS Chapter V, makes the MBS mandatory.

13 REVIEW OF SESSION REPORT

The report of the meeting (ENG3-13.1) was approved by the Committee.

Action item

The Secretariat is requested to forward the ENG3 Committee report (ENG3-13.1) to Council to note.

14 DATE AND VENUE OF NEXT MEETING

It is expected that the 4th session of the ENG Committee (ENG4) will be from 11th to 15th April 2016 at IALA HQ.

15 CLOSING OF THE MEETING

Noting some new faces and many familiar faces, the Deputy Secretary General thanked all Participants for attending. He also thanked the ENG Chair and Vice Chair.

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 ENG4, 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.

ANNEX A AGENDA**3rd Meeting of the AtoN Engineering and Sustainability Committee
(ENG3)**

The 3rd meeting of the **AtoN Engineering and Sustainability Committee** (ENG3) will be held from 16 – 20 November, 2015 at IALA, St Germain en Laye, France.

The opening plenary will commence at 1300 on Monday 16 November and the closing plenary will end at approximately 1300 on Friday, 20 November.

Committee Chair, Vice-Chair and Working Group Chairpersons are requested to meet at 0900 on Monday, 16 November 2015.

AGENDA

1. Introduction
 - 1.1. Administration and safety briefing
 - 1.2. Approval of the agenda
 - 1.3. Introductions and apologies
 - 1.4. Programme for the week
2. Review of action items from ENG2
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 C60 2015-05 Kuala Lumpur
 - 4.2. (PAP29-10 1) Report of PAP29
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
5.4.	CIE-IALA Liaison	Malcolm Nicholson
5.5.	Developments in AtoN Simulation Systems	Jong-Uk Kim
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	Gerardine Delanoye
6.2.	Installation of Coastal Monitoring Stations in PNG	Adam Hay
6.3.	Beyond FFL: Rhythmic Character for Range Estimation	Aivar Usk
6.4.	Development of a simulator for aids to navigation	Hiroyuki Nakajima
7. Review of Work Programme and WG expectations

7.1. Work programme

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
James Collocott	SAMSA	South Africa
Leif Arsen	Norwegian Coastal Administration	Norway
Sipke Hoekstra	Ministry of Infrastructure & Environment	Netherlands
Adrian Wilkins	Consultant Pharos Marine	UK
Shen Zhijiang	China MSA	China
Sigge Gustafsson	SMA	Sweden
Simon Brooks	AMS	Australia
Bert Frame	Sealite	Australia
Peter Dolan	Pharos Marine-Automatic Power	UK
Marisa Marco	Puertos del Estado	Spain

ANNEX C WORKING GROUP PARTICIPANTS**Working Group 1 Visual & Physical AtoN**

	Members	Organisation / Country
1	Malcolm Nicholson (Chair)	General Lighthouse Authorities of UK and Ireland / UK
2	Frank Hermann (Vice Chair)	German Federal Waterways & Shipping Administration / Germany
3	Yves-Marie Blanchard	CEREMA / France
4	Aivar Usk	CYBERNETICA AS / Estonia
5	Manuel Santos	Portuguese Lighthouse Authority / Portugal
6	Ivan Vargas	Pharos Marine Automatic Power / USA
7	Jørgen Royal Petersen	Danish Maritime Authority / Denmark
8	Fernando Romero	MSM / Spain
9	Jonas Lindberg	Sabik / Finland
10	Sami Lasma	FTA / Finland
11	Pärtel Kekkula	Estonian Maritime Administration / Estonia
12	Andrew Zeller	Tideland Signal / USA
13	Ju-Seop Han	KAAN / Korea
14	Jeon Jon Gee	Ministry of Fisheries / Korea
15	Bacha Chefou	A&C / Comoros

Working Group 2 Technical Knowledge & Sustainability

	Name	Organisation / Country
1	Adam Hay (Chair)	Nawae Construction / Papua New Guinea
2	Jörg Unterdeuweide (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	Raoel Coulor	Maritime Authority / Suriname
6	Eoghan Lehane	Commissioners of Irish Lights / Ireland
7	Baohong Wang	China MSA / China
8	LuisBellis Santa Cruz	Group Geocuba / Cuba
9	Diogenes Lopez Almeida	Oficina Nacional Hydrografia y Geod / Cuba
10	Mariano Luis Marpegan	Hidrovia S.A. / Argentina
11	Ronan AUTRET	CEREMA / France
12	Jose Carlos DIEZ	Puertos del Estado / Spain
13	Traore Kassoum	Port Autonome Abidjan / Ivory Coast
14	Adam Wettges	Canadian Coast Guard / Canada
15	Bob Trainor	US Coast Guard / USA
16	Chei Kum Sung	Ministry of Fisheries / Korea
17	Michel Cousquer	CEREMA / France
18	Joel TOURBOT	Inter-regional Maritime Directorate, France
19	Philippe Renaudin	CEREMA / France
20	Peter DOBSON	Trinity House Lighthouse Service / UK

ANNEX D LIST OF INPUT PAPERS**All papers were posted to the Committee website**

Number	Meeting	Agenda Item	Title / Author (if required)	Source	Presented by / WG
1	ENG3-	1.2	Draft Agenda 20151106	IALA Sec	Simon Millyard
2	ENG3-	1.4.1	Programme for the week 20150522	IALA Sec	Simon Millyard
3	ENG3-	2.1	Action Items from ENG2	ENG2	Seamus Doyle
4	ENG3-	3.1	Input paper Committee template July 2014	IALA Sec	Simon Millyard
5	ENG3-	4.1	Report 60th Session of the IALA Council C60 2015-05 Kuala Lumpur	C60	Simon Millyard
6	ENG3-	4.2	(PAP29-10 1) Report of PAP29	PAP29	Simon Millyard
7	ENG3-	5.1	Rapporteur report - Renewable energy sources	Peter Dobson	Peter Dobson
8	ENG3-	5.4	RR106 External Liaison Report - 28th CIE Session in the International Year of Light	Malcolm Nicholson	Malcolm Nicholson
9	ENG3-	6.1	Presentation IALA WWA brief 20150929	Gerardine Delanoye	Gerardine Delanoye
10	ENG3-	6.2	Presentation Installation of Coastal Monitoring Stations in PNG v2	Adam Hay	Adam Hay
11	ENG3-	6.2.1	Presentation Installation of Coastal Monitoring Stations in Papua New Guinea	Adam Hay	Adam Hay
12	ENG3-	6.3	Beyond FFL: Rhythmic Character for Range Estimation Aivar Usk	Aivar Usk	Aivar Usk
13	ENG3-	6.4	Development of a simulator for aids to navigation	Hiroyuki Nakajima	Hiroyuki Nakajima
14	ENG3-	7.1.1	(ENG2-11.2.5) Wiki Task Register	ENG2	David Jeffkins
15	ENG3-	7.1.2	(ENG2-11.1.10) ENG Committee Workplan 2014-18 - update from ENG2 post plenary	ENG2	David Jeffkins
16	ENG3-	9.1	(ENG1-11.2.10) WG1 E-110 Ed4 Draft Rhythmic characters of lights on AtoN ENG2 notes 20150521	ENG2	WG1
17	ENG3-	9.2	(ENG2-11.2.12) WG1 Draft IALA Guideline 1069 Ed2 Synchronisation of Lights 20150520	ENG2	WG1

Number	Meeting	Agenda Item	Title / Author (if required)	Source	Presented by / WG
18	ENG3-	9.3	(ENG2-11.2.14) WG1 Guideline 1038 Ed2 Ambient Light Levels at which Aids to Navigation Lights should switch on and off May2009 MOD May2015 Rev2	ENG2	WG1
19	ENG3-	9.4	(ARM2-11.1.7) Liaison Note to all committees on Navguide update	ARM2	WG1/WG2
20	ENG3-	9.5	Optical filter material for marine signal lights	Frank Hermann	WG1
21	ENG3-	9.6	Use of optical filters with different light sources	Frank Hermann	WG1
22	ENG3-	9.7.1	AtoN-on-Demand 20151019	Aivar Usk	WG1
23	ENG3-	9.7.2	Cybernetica AtoN Fog Lights on Demand IALA EEP21 20131007	Aivar Usk	WG1
24	ENG3-	9.8	Draft IALA Guideline 1041 on Sector Lights- intersessional 20151019	Frank Hermann	WG1
25	ENG3-	9.9	Development of LED Large Beacon in Korea - Inf	Ju-Seop Han	WG1
26	ENG3-	10.1	(ENG2-11.2.1) WG2 Draft Guideline on Commissioning	ENG2	WG2
27	ENG3-	10.2	(ENG2-11.2.2) WG2 Maintenance of AtoN structures	ENG2	WG2
28	ENG3-	10.3	(ENG2-11.2.3) WG2 Solar Model Comparison	ENG2	WG2
29	ENG3-	10.4	(ENG2-11.2.4) WG2 Review of IALA Documents - power systems 20141120	ENG2	WG2
30	ENG3-	10.5	(ENG2-11.2.5) WG2 Draft Guideline 1077 Maintenance of Aids to Navigation	ENG2	WG2
31	ENG3-	10.6	(ENG2-11.2.6) WG2 New guideline structure on buoys	ENG2	WG2
32	ENG3-	10.7	(ENG2-11.2.7) WG2 Buoys and moorings working paper	ENG2	WG2
33	ENG3-	10.8	(ENG2-10.8) Commissioning of AtoN	ENG2	WG2
34	ENG3-	10.9	(ENG2-11.2.8) Maintenance of AtoN Structures IALA - guidelines & recommendations	ENG2	WG2
35	ENG3-	10.10	(ENG2-10.11) Problems of fitting AIS antennae on Buoys	ENG2	WG2
36	ENG3-	10.11	(ARM2-11.1.3) Liaison Note to ENG on audible signal information in the NAVGUIDE	ARM2	WG2/WG1
37	ENG3-	10.12	(ARM2-11.1.4) Liaison Note to ENAV on e-Navigation developments	ARM2	WG2
38	ENG3-	10.13	(ARM2-11.1.5) Liaison Note to IALA members on Disaster Recovery	ARM2	WG2

Number	Meeting	Agenda Item	Title / Author (if required)	Source	Presented by / WG
			planning Rev 1		
39	ENG3-	10.13.1	(ARM2-11.2.1) WG1 WP1 disaster recovery	ARM2	WG2
40	ENG3-	10.14	draft Technical Programme for Workshop on Sustainable Light & Power	WS Steering Group	WG2/WG1
41	ENG3-	10.15	Development of marine aids to navigation simulator 20151019	Hiroyuki Nakajima	WG2
42	ENG3-	10.16	Comparison of Buoy Solar Model Performance	Peter Dobson	WG2
43	ENG3-	10.17	Information on Maximum Power Point Tracking (MPPT)	Peter Dobson	WG2
44	ENG3-	10.18	Battery Sizing Calculator	Peter Dobson	WG2
45	ENG3-	10.19	Liaison note WWA to ENG-3 on WWA input for review	Gerardine Delanoye	WG2
46	ENG3-	10.20	L2 Model Course AtoN Service Craft and Buoy Tenders Ed 2 June 2016.	Gerardine Delanoye	WG2
47	ENG3-	10.21	L2 Model Course Introduction to AtoN Buoyage Ed 2 June 2016	Gerardine Delanoye	WG2
48	ENG3-	10.22	L2 Model Course Introduction to Radionavigation and DGNSS Ed 2 June 2016	Gerardine Delanoye	WG2
49	ENG3-	10.23	L2 Model Course Maintenance of Mercury Rotating Optics Ed 2 June 2016	Gerardine Delanoye	WG2
50	ENG3-	10.24	L2 Model Course Racons Ed 2 June 2016	Gerardine Delanoye	WG2
51	ENG3-	10.25	L2 Overview IALA WWA.L2.0 Ed 3 June 2016	Gerardine Delanoye	WG2
52	ENG3-	10.26.1	(ENAV17-14.1.11) Liaison note re draft Guideline on VDES User Requirements	ENAV17	WG2
53	ENG3-	10.26.2	(ENAV17-11.23) PNT-relevant topics to VDES 20151008	ENAV17	WG2
54	ENG3-	10.27	Guideline 1036 Ed2 on Environmental Management Dec2013 Draft Revision	James Collocott	WG2
55	ENG3-	10.28	Environmental Management	James Collocott	WG2
56	ENG3-	10.29.1	Comparison of Buoy Solar Model Performance	Peter Dobson	WG2
57	ENG3-	10.29.2	Sample calc using Retscreen Alternative #1 minimum autonomy for HA Buoy	Peter Dobson	WG2
58	ENG3-	10.29.3	Sample calc using Retscreen Alternative #2 minimum autonomy for HA Buoy	Peter Dobson	WG2
59	ENG3-	10.29.4	Sample calc using IALA Model for HA Buoy	Peter Dobson	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.

Output Papers			
	Number	Title	Status
1	ENG3- 11.1.1	Draft IALA Guideline 1041 on Sector Lights	To Council 62
2	ENG3- 11.1.2	Model Course AtoN Service Craft and Buoy Tenders ed 2 June 2016	To Council 62
3	ENG3- 11.1.3	Model Course Introduction to AtoN Buoyage ed 2 June 2016	To Council 62
4	ENG3- 11.1.4	Model Course Introduction to Radionavigation and DGNSS ed 2 June 2016	To Council 62
5	ENG3- 11.1.5	Model Course Maintenance of Mercury Rotating Optics ed 2 June 2016	To Council 62
6	ENG3- 11.1.6	Model Course Racons ed 2 June 2016	To Council 62
7	ENG3- 11.1.7	Overview IALA WWA L2.0 ed 3 June 2016	To Council 62
8	ENG3- 11.1.8	Liaison note ENG to ARM re Navguide updates	To ARM3
9	ENG3- 11.1.9	Liaison note ENG3 to ARM 3 on Draft Guideline on Selection of Rhythmic Characters review 20151119	To ARM3
10	ENG3- 11.1.10	Liaison note to ARM on disaster recovery planning	To ARM3
11	ENG3- 11.1.11	Liaison note ENG to ENAV on VDES user requirements	To ENAV18
12	ENG3- 11.1.12	IALA Dictionary & Navguide update of the definition of an Aid to Navigation	To DWG
13	ENG3- 13.1	Report ENG3	To Council for noting

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

Working Papers			
	Number	Title	Status
1	ENG3- 11.2.1	ENG Committee Workplan 2014-18 - updated at ENG3	To ENG4
2	ENG3- 11.2.2	ENG Work Programme Task Register - updated at ENG3	To ENG4
3	ENG3- 11.2.3	ENG Committee TOR Wiki - updated at ENG3	None
4	ENG3- 11.2.4	WG2 Guideline 1036 ed2 On Environmental Management 20151118 from ENG3	To ENG4
5	ENG3- 11.2.5	WG2 Draft Guideline Maintenance of AtoN Structures	To ENG4
6	ENG3- 11.2.6	WG2 Review of IALA documents - maintenance of AtoN Structures	To ENG4
7	ENG3- 11.2.7	WG2 NAVGUIDE Update Plan - updated at ENG3	To ENG4
8	ENG3- 11.2.8	WG2 Solar model comparison	To ENG4
9	ENG3- 11.2.9	WG2 Review of IALA documents - Power Systems	To ENG4
10	ENG3- 11.2.10	WG2 Revised Guideline 1006 Plastic Buoys	To ENG4
11	ENG3- 11.2.12	WG2 sub working group - Buoys and Moorings	To ENG4
12	ENG3- 11.2.13	WG2 Draft Guideline on Use of Modern AtoN Equipment in Heritage Lighthouses	To ENG4
13	ENG3- 11.2.14	WG2 Draft Guideline on Commissioning	To ENG4
14	ENG3- 11.2.15	WG1 Rec E-110 Ed4 Draft Rhythmic characters of lights on AtoN ENG2 notes 20150521	To ENG4
15	ENG3- 11.2.16	WG1 Draft Guideline on Selection of Rhythmic Characters of Lights on AtoN 20151119	To ARM3 To ENG4

ANNEX F WORK PROGRAMME – REVIEW OF PROGRESS WITH DELIVERABLES AT ENG3

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		☒	☐	☐	
1.1.2 Develop guidance on the selection of rhythmic characters including 1069 Synchronisation	2	5		☒	☐	☐	
1.1.3 Update / Replace 1038 On Ambient Lights Levels	2	5		☒	☐	☐	
2.5.1. Populate the S100 registry for relevant AtoN classes	3	6		☒	☐	☐	
5.1.1 Update the Navguide as requested by ARM Committee	5	6	2-7	☒	☐	☐	Updated by Liaison note from ARM
5.1.2 Review of IALA documents	1	7		☒	☒	☐	
5.1.3 Review and Update E200 On Marine Signal Lights	3	6	4-7	☐	☒	☐	Duration extended by 1 session
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		☒	☐	☐	
5.1.5 Review and Update E108 Ed 2 For the Surface Colours used as visual signals on aids to navigation	6	6		☒	☐	☐	
5.1.6 Review of IALA Recommendation E-110 for the Rhythmic Characters of Lights on Aids to Navigation (2012)	6	7	2-5	☒	☐	☐	
5.1.7 Update Recommendation E-111 For port traffic signals	4	5		☒	☐	☐	
5.1.8 Update E-112 For Leading Lights and 1023 for the design of leading lights	4	6	3-5	☒	☐	☐	
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	☒	☐	☐	
5.1.10 Update 1041 On Sector Lights	1	3		☒	☐	☐	
5.1.11 Update 1061 Illumination of Structures	1	2	4	☐	☒	☐	Duration extended by one session
5.1.12 Update 1065 On Aids to Navigation Signal Light Beam Vertical Divergence	6	6		☒	☐	☐	
5.1.13 Review and Update of Guideline 1073 on Conspicuity of AtoN at Night	5	7		☒	☐	☐	
5.1.14 Review and Update Guideline 1069 on Synchronisation of Lights	2	5		☒	☐	☐	
5.2.1 Identify current documents as potential Standards, Recommendations, Guidelines & Manuals	5	7		☒	☒	☐	
5.3.1 Presentation to ENG committee on new developments in AtoN & related topics	1	7		☒	☐	☐	

Task		Start	Planned	Revised	Progress Indicator			Status
WG2 – Knowledge & Sustainability								
1.5.2.	Workshop on Lights and Batteries – IALABATT/IALALITE	1	6		☒	☐	☐	Scheduled for ENG5
2.1.1.	Develop further guidance on plastic buoys, systems & sensors	1	6		☒	☐	☐	Proposal Approved by Council
2.1.2	Engineering guidance on the implementation of e-Navigation systems	3	7		☒	☐	☐	Scheduled for ENG4
2.2.1.	Develop guidance on sustainable AtoN design & maintenance.	3	6		☒	☐	☐	Commenced ENG1
2.2.2.	Develop guidance on the commissioning of AtoN equipment and systems and engineering audits.	2	5		☒	☐	☐	Commenced at ENG3
2.3.1	Develop guidance on AtoN design & maintenance for hot climates.	4	7		☒	☐	☐	Progressed at ENG3
2.3.2	Workshop on AtoN delivery and maintenance in extreme heat	3	4		☒	☐	☐	Commenced ENG3
2.4.1	Review and update guidance on safety of personnel	4	7		☒	☐	☐	Commenced ENG1
3.2.1.	Support the WWA in updating model courses on standards for training and certification of AtoN personnel	1	7		☒	☐	☐	Scheduled for ENG5
4.1.1.	Develop guidance on the use of heritage lighthouses for modern AtoN equipment & systems.	3	6		☒	☐	☐	Proposal Approved by Council
4.1.2.	Develop guidance on Maintenance of AtoN structures	2	6		☒	☐	☐	Scheduled for ENG4
5.1.1.	Navguide updates	3	6		☒	☐	☐	Commenced ENG1
5.1.2.	Review of IALA documents (ref ENG1 input paper on document ownership)	1	7		☒	☐	☐	Commenced at ENG3

ANNEX G ACTION ITEMS*Action Items for the IALA Secretariat*

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| 1 | The IALA Secretariat is requested to continue work on improving access to the CALMAR software. | 7 |
| 2 | The Secretariat is requested to forward the revised ENG Committee Workplan, ENG3-11.2.1, to ENG4. | 10 |
| 3 | The Secretariat is requested to forward the revised ENG Work Programme Task Register for 2014-2018, ENG3-11.2.2, to ENG4. | 10 |
| 4 | The Secretariat is requested to forward ENG3-11.2.16 Draft Guideline on the Selection of Rhythmic Characters of Lights on AtoN to ARM3 & ENG4. | 11 |
| 5 | The Secretariat is requested to forward Liaison Note ENG3-11.1.9 to ARM3. | 11 |
| 6 | The Secretariat is requested to forward ENG3-11.2.17, Draft Guideline 1038, to ENG4. | 11 |
| 7 | The Secretariat is requested to forward ENG3-11.2.15, Recommendation E-110 Ed4 Draft Rhythmic characters of lights on AtoN ENG2 notes 20150521, to ENG4. | 12 |
| 8 | The Secretariat is requested to forward ENG3-11.1.1, Draft IALA Guideline 1041 On Sector Lights, to Council for approval. | 13 |
| 9 | The Secretariat is requested to submit new terms used in ENG3-11.1.1, Draft IALA Guideline 1041 On Sector Lights to the IALA Dictionary updating process. | 13 |
| 10 | The IALA Secretariat is requested to forward working papers ENG3-11.2.10 and ENG3-11.2.12 to ENG4. | 14 |
| 11 | The Secretariat is requested to forward paper ENG3-11.1.11 to the ARM Committee. | 15 |
| 12 | The IALA Secretariat is requested to forward working paper ENG3-11.2.4, Guideline 1036 ed2 On Environmental Management 20151118, to ENG4. | 15 |
| 13 | The IALA Secretariat is requested to forward working paper ENG3-11.2.5 and ENG3-11.2.6 to ENG4. | 15 |
| 14 | The IALA Secretariat is requested to forward output papers ENG3-11.1.2, ENG3-11.1.3, ENG3-11.1.4, ENG3-11.1.5, ENG3-11.1.6 and ENG3-11.1.7 to the IALA Council for approval. | 16 |
| 15 | The IALA Secretariat is requested to forward working paper ENG3-11.2.13 to ENG4. | 16 |
| 16 | The IALA Secretariat is requested to forward working paper ENG3-11.2.5 and ENG23-11.2.6 to ENG4. | 16 |
| 17 | The IALA Secretariat is requested to forward Liaison Note ENG3-11.1.8 to the ARM Committee. | 17 |
| 18 | The IALA Secretariat is requested to forward Working Paper ENG3-11.2.7 to ENG4. | 17 |
| 19 | The IALA Secretariat is requested to forward Working Papers ENG3-11.2.8 and ENG3-11.2.9 to ENG4. | 17 |
| 20 | The IALA Secretariat is requested to forward liaison note ENG3-11.1.10 to the ARM Committee. | 17 |
| 21 | The Secretariat is requested to forward the ENG3 Committee report (ENG3-13.1) to Council to note. | 18 |

Action Items for Members

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| 22 | David Jeffkins is requested to upload input papers ENG3-9.5, ENG3-9.6, ENG3-10.8, ENG3-10.10, and ENG3-10.17 to the IALA Wiki. | 8 |
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- 23 ENG Committee members are requested to submit articles for the IALA Bulletin to Marie-Helene Grillet. 9
- 24 Members of the task group are requested to identify further work items to contribute to the Draft Guideline on the Selection of Rhythmic Characters of Lights. 11
- 25 GLA R&RNAV are requested to provide input to ENG4 on the results of trials pertaining to minimum flash duration and maximum eclipse times. 11
- 26 Pärtel Keskküla is requested to provide input to ENG4 on the maximum eclipse time for group flashing lights. 11
- 27 Members of the task group are requested to identify further work items to contribute to the revision of Guideline 1038. 11
- 28 Sigge Gustafsson is requested to provide an input paper to ENG4 on the SMA experiences with AtoN AIS detection by vessels for switching AtoNs on/off of. 11
- 29 Frank Hermann and Fernando Romero are requested to work intersessionally on the revision of E200-2 and provide an input paper to ENG4. 12
- 30 Malcolm Nicholson is requested to provide input to ENG4 on the revision of E200-4. 12
- 31 Yves-Marie Blanchard is requested to provide input to ENG4 on the revision of E200-5. 12
- 32 Sigge Gustafsson and Jorgen Royal Petersen are requested to provide input to ENG4 on the revision of Recommendation E-106. 12
- 33 ENG Committee Members are requested to submit input papers in support of the revision of Recommendation E-111 on Port Traffic Signals. 12
- 34 Members are requested to familiarise themselves with the documents relating to Recommendation E-112 for Leading Lights and Guideline 1023 for the design of leading lights and provide input papers to ENG4 to support the update. 13
- 35 Bob Trainor is requested to submit the USCG revised leading lines calculator by end of January 2016 in order that Frank Hermann and Yves-Marie Blanchard may analyse the content in preparation for ENG4. 13
- 36 Sami Lasma is requested to input the Finnish leading line calculator to ENG4. 13
- 37 The Chair/ Vice Chair of ENG Committee are requested to consider if a Recommendation on Sector Lights based on section 5.1 of ENG3-11.1.1, Draft IALA Guideline 1041 On Sector Lights, is required. 13
- 38 Malcolm Nicholson is requested to work on Guideline 1061 on Illumination of Structures intersessionally and submit an input to ENG4. 13
- 39 Members are requested to input presentations to future ENG meeting on topics of interest to the Committee. 14
- 40 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
- 41 Committee Members are requested to provide information or input to ENG4 regarding the use of plastic buoys in hot climate and high UV exposure environments, power supply for buoys, especially battery technology (decreasing the size) and remote control technologies. 14
- 42 Committee members are requested to provide any information they may have on interfacing technology with AtoN systems and submit as input to ENG4. 15
- 43 Committee members are requested to seek relevant expertise within their own organisations to assist with the review of Input Paper 3-10.26.1, Liaison note re draft Guideline on VDES User Requirements, and to forward any feedback directly to ENAV18. 15
- 44 Committee Members are requested to review the working paper ENG3-11.2.4, Guideline 1036 ed2 On Environmental Management 20151118 and provide input to ENG4. 15
- 45 Members are requested to provide input papers to ENG4 on commissioning of AtoN in their respective countries. 15

- 46 Committee Members are requested to note the proposed dates for the Workshop on the challenge of providing AtoN services in extremely hot climates. 15
- 47 Committee members are requested to submit details of relevant safety systems, policies, documented procedures or other issues related to safety of personnel to ENG4. 16
- 48 Committee Members are requested to provide input to ENG4 on any relevant experience with the use of modern AtoN equipment and systems in heritage lighthouses. 16
- 49 Committee Members are encouraged to review working paper ENG3-11.2.5 on maintenance of AtoN structures and provide feedback or information on maintenance systems or processes in their respective organisations to ENG4. 16