PAP25 Input

Agenda item 8.1

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Proposals on IALA Documentation

# Summary

This paper sets out two proposals:

## The preparation of a suite of IALA Guidance Publications, consolidating the material already published in IALA Recommendations and Guidelines. This suite of publications would make access to and use of IALA’s guidance easier, would promote IALA’s image and reach and could be used as reference material for IALA’s World Wide Academy

## The introduction of a new category of document termed an Information Paper.

## Purpose of the document

The paper is intended to stimulate discussion at PAP25 on proposed new types of documentation which would be prepared during the 2014 - 2018 session.

## Related documents

IALA Recommendations and Guidelines

Proposal for the Categorisation of Recommendations and Guidelines (PAP25)

NAVGUIDE 2010 Edition

VTS Manual

Model Course E-141/1 – Level 1 Manager Training

# Background

**2.1** **Guidance Publications:** To facilitate the harmonisation of aids to navigation provided throughout the world, IALA publishes documentation in the form of Manuals, Recommendations and Guidelines for use by its members and other organisations providing aids to navigation. The proposal for the Categorisation of Recommendations and Guidelines, also prepared for discussion at PAP25, is an attempt to bring together these documents in organised lists to facilitate use by IALA Members and other AtoN providers. However, there is still a myriad of documents and content with which the unfamiliar provider of aids to navigation will need to come to terms. This paper sets out a proposal to organise and consolidate the content of many IALA Recommendation and guidance documents. These documents could be termed IALA handbooks or manuals and would sit alongside the NAVGUIDE, the VTS Manual, the Lighthouse Conservation Manual etc. to assist, inform and guide providers of aids to navigation.

**2.2** **Information Papers:** In the process of producing IALA Recommendations and Guidelines, IALA Committees produce information on current practices, ideas, and proposals which when consolidated result in documents which would be of use to IALA members but which do not contain guidance. A category of IALA document is needed and the term “Information paper” is suggested.

# Discussion – Guidance Documentation

In the following sections examples of the possible content of a number of proposed guidance publications are set out. This is an expansion of the concept of consolidating a number of recommendations as was done in respect of the E-200 series ‘On Marine Signal Lights’ and similarly, the example of consolidating a number of guidelines into the 1067 series ‘On Power Systems and Power Sources for Aids to Navigation’.

## IALA Guidance Document on Light and Visual Perception

The concept of this publication is to bring together information on:

* Light & Vision;
* Range Computation;
* Colour;
* Daymark Perception;
* etc.

The idea is that it would bring together in one publication, a distillation or expansion of the contents of Recommendations:

* E-200 Series ‘On Marine Signal Lights’;
* E-110 ‘On the Rhythmic Characters of Lights on Aids to Navigation’ ;
* E-108 ‘On the Surface Colours used as Visual Signals on Aids to Navigation;

together with the distillation or expansion of the contents of Guidelines:

* 1043 ‘On Light Sources used in Visual Aids to Navigation’;
* 1073 ‘On Conspicuity of AtoN Lights at Night’;
* 1048 ‘On LED Technologies and their use in Signal Lights’;
* 1049 ‘On the Use of Modern Light Sources in Traditional Lighthouse Optics’;
* 1038 ‘On Ambient Light Levels at which Aids to Navigation should switch on and off’;
* 1061 ‘On Light Applications – Illumination of Structures’;
* 1065 ‘On Aids to Navigation Signal Light Beam Vertical Divergence’.

It is envisaged that this type of publication would consolidate the content of existing IALA Recommendations and Guidelines and include the IALA Recommendations as Annexes.

## IALA Guidance Document on Short Range AtoN

The concept of this publication would be to bring together information on:

* Lanterns;
* Power Systems;
* Buoys;
* Moorings;
* Racons;
* etc.

The idea is to bring together in one publication a distillation or expansion of the contents of Recommendations:

* E-111 ‘On Port Traffic Signals’;
* E-112 ‘On Leading Lights’;
* E-106 ‘Use of retro-reflecting material on aids to navigation marks within the IALA Maritime Buoyage System’;
* E-107 ‘On Moorings for Aids to Navigation’;
* R-101 ‘On Maritime Radar Beacons (RACONS)’.

together with the distillation or expansion of the contents of Guidelines:

* 1023 ‘The Design of Leading Lines’;
* 1041 ‘On Sector Lights’;
* 1006 ‘On Plastic Buoys’;
* 1015 ‘On Painting Aid to Navigation Buoys’;
* 1066 ‘On Moorings for Floating Aids to Navigation’;
* 1011 ‘On a Standard Method for defining and calculating the load profile of aids to navigation’;
* 1067-0 ‘On Selection of Power Systems for Aids to Navigation and Associated Equipment’;
* 1067-1 ‘On Total Electrical Loads of Aids to Navigation’;
* 1067-2 ‘On Power Sources’;
* 1067-3 ‘On Electrical Energy Storage for Aids to Navigation’;
* 1039 ‘On Designing Solar Power Systems for Aids to Navigation’;
* 1010 ‘On Racon Range Performance’.

and the contents of the ‘IALA Maritime Buoyage System’.

## IALA AIS Manual

For some time the need for an AIS Manual has been recognised. It is impossible for any newcomer to AIS to easily understand the relationship of the various IALA, ITU, IEC and IMO documentation. An IALA Manual could also bring together the existing A-124 and A-126, add some or all of the now-missing work originally envisaged for A-124, and point to the proposed new IALA Standards on AIS base stations and AIS AtoN.

## IALA e-Navigation Manual

IALA should become the harmonising organisation for e-Navigation, data and communications (at least for the ‘three essential elements’) and so an AIS Manual could perhaps be a volume of, or part of, a broader manual covering e-Navigation communications and e-Navigation data modelling including the IALA S-100 registry.

## IALA World Wide Academy

IALA Publications proposed in Sections 3.1 and 3.2 and the IALA Manual proposed in Section 3.3 would be very useful as reference material for the IALA World Wide Academy if they were designed in line with the Modules set out in Model Course E-141/1 – Level 1 Manager Training, particularly Modules 4A, 4B, 4D and 5. Tables 9, 10, 12 and 13 from E-141/1 are included as Annex 1 to this document for reference. It must pose considerable difficulties for both trainers and students sifting through the myriad of Recommendations and Guidelines referenced in these tables. Provision of consolidated documentation would greatly ease this process. IALA’s aim should be to reach out and down into busy organisations and to busy people to make their jobs easier.  The documentation must be clear, easy to read and of course understandable.

# Discussion – Information Papers

From time to time, the work of IALA Committees will result in the accumulation of information on current practices, ideas, or proposals which when consolidated results in a document that would be of use to IALA members but which does not contain guidance. A recent example was the excellent paper produced by the e-Navigation Committee on portrayal.

A category of IALA document is needed and the term ‘Information paper’ is suggested. It is proposed that an information paper could be approved by the Secretary-General and then placed on the IALA website. Web hierarchy and structure would have to be agreed at a later stage.

The merit of this is that valuable information likely to be important to many members, especially those unable to attend Committee meetings, will not be lost but will be available to all.

It is likely that the Information Paper will be necessary as IALA becomes involved more in the harmonisation of e-Navigation test beds, and would keep IALA members informed of IALA’s work in this area ahead of the creation of firm guidance

# Action requested of PAP25

* PAP25 is requested to discuss the merits of preparing consolidated guidance publications using the material contained in IALA Recommendations and Guidelines;
* PAP25 is requested to consider if such publications were to be prepared would it be acceptable to reduce the number of IALA Guidelines on those subjects;
* PAP25 is requested to consider if such publications were to be prepared, should they be published as real and/or virtual documents;
* PAP25 is requested to consider if the preparation of such publications would be a suitable task for inclusion in the 2014 – 2018 Session;
* PAP25 is requested to decide on a name for such publications, “Manual”, “Handbook”, “Guide” or other;
* PAP25 is requested to discuss the merits of introducing a new category of documentation termed ‘Information Paper’.

Tables from Model Course E-141/1 – Level 1 Manager Training:

**MODULE 4A TECHNICAL FUNCTIONS – VISUAL AtoN**

**MODULE 4B TECHNICAL FUNCTIONS – RADIO AtoN**

**MODULE 4D SOUND SIGNALS; COMMUNICATIONS; e-NAVIGATION; TIDE GAUGES; STRUCTURES; REMOTE MONITORING AND CONTROL**

**DETAILED TEACHING SYLLABUS FOR MODULE 4A; 4B – TECHNICAL FUNCTIONS – VISUAL and RADIO AIDS TO NAVIGATION**

*Table 9: Detailed Teaching Syllabus for Module 4A*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module** | **Element** | **Sub-element** | **Subject** | **Level of Competence** | **Recommended training aids; exercises and external visits** | **References**  Rec = Recommendation  GL = Guideline | **Lecture No.** |
| **4A** |  |  | **TECHNICAL FUNCTIONS – VISUAL AtoN** |  | | |  |
|  | **4a.1** | **Visual AtoN – General Functions** |  | | | |
|  |  | 4a.1.1 | Descriptions, definitions and distinguishing features | 3 |  | NAVGUIDE 3.1  IALA Rec O-130; E-106; E-108 IALA Rec E-200-3  IALA GL 1035 | 27 |
|  |  | 4a.1.2 | Signal colours | 2 |
|  |  | 4a.1.3 | Meteorological visibility; transmissivity, refraction | 3 |
|  |  | 4a.1.4 | Contrast and use of binoculars |
|  |  | 4a.1.5 | Ranges: geographical, meteorological, visual, nominal |
|  |  | 4a.1.6 | AtoN lights: lens development, light sources, IPS lanterns | 2 | **Note:** some participants may require tutorials to ensure an equal entry level of understanding. If this applies to most participants, lecture 28 may have to be covered in two periods of instruction | NAVGUIDE 3.2; Figure 8  IALA GL 1043; 1048; 1064  IALA Rec E-200-2; E-200-4  NAVGUIDE Figure 11  NAVGUIDE Tables 11 – 15  IALA GL 1038; 1051 | 28 |
|  |  | 4a.1.7 | Light measurement: units; inverse square and Allard’s law |
|  |  | 4a.1.8 | Luminous intensity and nominal range | 3 |
|  |  | 4a.1.9 | Colour measurement | 2 |
|  |  | 4a.1.10 | Timing of astronomical events | 1 |
|  |  | 4a.1.11 | Background lighting and glare | 3 |
|  |  | 4a.1.12 | Daytime operations: range and sector lights (see **4a.6.1**) |
|  |  | 4a.1.13 | Visual AtoN attribute information | 2 |
|  | **4a.2** |  | **Light and Characters** |  | | | |
|  |  | 4a.2.1 | Rhythms and Characters | 4 |  | NAVGUIDE 3.2.4; Table 7  IALA MBS  IALA Rec E-110; E-200; E-201  IALA Rec E-200-5  IALA GL 1065; 1069 | 29 |
|  |  | 4a.2.2 | Lights used in the IALA MBS |
|  |  | 4a.2.3 | Maximum periods for light characters | 2 |
|  |  | 4a.2.4 | Synchronisation of lights |
|  |  | 4a.2.5 | Vertical divergence |
|  |  | 4a.2.6 | Performance of lights | 3 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module** | **Element** | **Sub-element** | **Subject** | **Level of Competence** | **Recommended training aids; exercises and external visits** | **References**  Rec = Recommendation  GL = Guideline | **Lecture No.** |
|  | **4a.3** |  | **Fixed Aids to Navigation** |  | | | |
|  |  | 4a.3.1 | Types of fixed AtoN and their functions | 3 | Visit port operating with traffic signals if available | NAVGUIDE 3.2.5; Table 14  IALA Rec E-111 | 30 |
|  |  | 4a.3.2 | Day marks |
|  |  | 4a.3.3 | Port Traffic Signals | 1 |
|  | **4a.4** |  | **Floating Aids to Navigation** |  | | | |
|  |  | 4a.4.1 | Use of minor floating AtoN | 3 |  | IALA MBS; NAVGUIDE 3.2.6  IALA Rec O-104; O-130  IALA Rec O-133  IALA GL 1006; 1011; 1046 IALA GL 1047 | 31 |
|  |  | 4a.4.2 | Major floating AtoN and light vessels | 1 |
|  |  | 4a.4.3 | Technical considerations and costs | 2 |
|  |  | 4a.4.4 | Steel versus plastic buoys |
|  |  | 4a.4.5 | Design considerations | 2 |  | IALA Rec E-107  GL 1036; 1037;1066  Pharos Marine mooring handbook or similar | 32 |
|  |  | 4a.4.6 | Mooring components, design and swing radius |
|  |  | 4a.4.7 | Installation and monitoring of buoy positions |
|  | **4a.5** |  | **Topmarks and markings** |  | | |
|  |  | 4a.5.1 | Use and design of topmarks | 2 |  | IALA Rec E-106 |
|  |  | 4a.5.2 | Retro-reflecting materials | 1 |
|  | **4a.6** |  | **Sector Lights and Leading Lines** |  | | | |
|  |  | 4a.6.1 | Range lights | 2 | Sector light and leading line planning exercise  Visit port with PDL and/or leading lights | NAVGUIDE 3.2.7  IALA GL 1023; 1041  IALA Rec E-112 | 33 |
|  |  | 4a.6.2 | Bearings from seaward and angles of uncertainty | 3 |
|  |  | 4a.6.3 | Precision Direction Lights | 2 |
|  |  | 4a.6.4 | Design considerations for sector lights |
|  |  | 4a.6.5 | Transits and leading lines |

*Table 10: Detailed Teaching Syllabus for Module 4B*

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module** | **Element** | **Sub-element** | **Subject** | **Level of Competence** | **Recommended training aids; exercises and external visits** | **References**  Rec = Recommendation  GL = Guideline | **Lecture No.** |
| **4B** |  |  | **TECHNICAL FUNCTIONS – RADIO AtoN** |  | | | |
|  | **4b.1** | **Types of Radio AtoN; New Technology Radars** |  | | | |
|  |  | 4b.1.1 | Background and definitions | 2 |  | NAVGUIDE 4.12 – 4.13  Lists of Radio Signals | 34 |
|  |  | 4b.1.2 | New Technology (NT) radars | 1 |
|  |  | 4b.1.3 | Radar beacons and NT radars | 2 |
|  |  | 4b.1.4 | Radar target enhancers | 1 |
|  | **4b.2** |  | **Radar Beacons -(Racons Technical Aspects** |  | | | 34 |
|  |  | 4b.2.1 | Frequency agile radar beacons (revision of **2.2.6**) | 2 |  | NAVGUIDE 4.13  IALA Rec R-101; O-113  IALA GL 1010 |
|  |  | 4b.2.2 | Signal characteristics |
|  |  | 4b.2.3 | Performance criteria |
|  |  | 4b.2.4 | Technical considerations |
|  | **4b.3** |  | **Loran** |  | | | |
|  |  | 4b.3.1 | Loran-C – basic principles | 1 |  | Lists of Radio Signals  NAVGUIDE 4.12 | 35 |
|  |  | 4b.3.2 | Operational chains and their use to monitor GNSS |
|  |  | 4b.3.3 | e-Loran |
|  | **4b.4** |  | **Global Navigation Satellite Systems (GNSS)** |  | | | |
|  |  | 4b.4.1 | IALA policy (revision of **2b.2.1**) | 3 |  | NAVGUIDE 4.9; 4.11  Lists of Radio Signals  Mariners Handbook  IALA Rec R-121 [R-115 (EU)]  IALA Rec R-129; R-135; A-124  IALA GL 1016; 1053; 1060 | 36 |
|  |  | 4b.4.2 | GNSS vulnerability |
|  |  | 4b.2.3 | The future of GNSS and DGNSS |
|  |  | 4b.2.4 | Submission of DGNSS as a component of WWRNS |
|  |  | 4b.2.5 | Receiver Autonomous Integrity Monitoring | 1 |
|  | **4b.5** |  | **Automatic Identification System (AIS)** |  | | | |
|  |  | 4b.5.1 | AIS overview: purpose; functions; strategic applications | 3 |  | NAVGUIDE 4.18 – 4.22  IALA GL 1028; 1029; 1050  IALA GL 1059; 1062  IALA Rec A-123; A-124; A-126  ITU-RM.1371 | 37 |
|  |  | 4b.5.2 | AIS system characteristics and carriage requirements |
|  |  | 4b.5.3 | Shore-based AIS |
|  |  | 4b.5.4 | AIS as an AtoN |
|  |  | 4b.5.5 | Management and monitoring of AIS |
|  |  | 4b.5.6 | AIS standards and limitations | 3 | **Note**: LRIT can form part of lecture 39 if considered appropriate | IALA Rec A-126  IALA GL 1062  ITU-RM.585-4  NAVGUIDE 4.15 – 4.17 | 38 |
|  |  | 4b.5.7 | AIS generated virtual and synthetic AtoN |
|  |  | 4b.5.8 | Use of Message 8 for meteorological and hydro data |
|  |  | 4b.5.9 | IALA-Net |
|  |  | 4b.5.10 | Long Range Tracking and Identification (LRIT) | 1 |

**DETAILED TEACHING SYLLABUS FOR MODULE 4D – SOUND SIGNALS; COMMUNICATIONS; e-NAVIGATION; TIDE GAUGES; STRUCTURES; REMOTE MONITORING AND CONTROL**

*Table 12: Detailed Teaching Syllabus for Module 4D*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module** | **Element** | **Sub-element** | **Subject** | **Level of Competence** | **Recommended training aids; exercises and external visits** | **References**  Rec = Recommendation  GL = Guideline | **Lecture No.** |
| **4D** |  |  | **SOUND SIGNALS; COMMUNICATIONS; e-NAV; TIDE GAUGES; STRUCTURES; REMOTE MONITORING** |  | | |  |
|  | **4d.1** | **Sound Signals** |  | | | |
|  |  | 4d.1.1 | Use of sound signals | 1 |  | NAVGUIDE 6.5  IALA Rec E-109; E109B | 41 |
|  |  | 4d.1.2 | Fog detectors |
|  |  | 4d.1.3 | Range of sound signals |
|  | **4d.2** |  | **Communications** |  | | | |
|  |  | 4d.2.1 | Global Maritime Distress and Safety System (GMDSS) | 4 |  | NAVGUIDE 6.6.1 – 6  NAVGUIDE 4.14  Lists of Radio Signals | 42 |
|  |  | 4d.2.2 | Maritime Safety Information (revision of **2a.3.4**) |
|  |  | 4d.2.3 | IALA WWRC Plan | 2 |
|  | **4d.3** |  | **e-Navigation** |  | | |
|  |  | 4d.3.1 | Definition, strategy and implementation | 3 |  | NAVGUIDE 4.2  IALA Rec e-Nav-140  IALA GL 1072 |
|  |  | 4d.3.2 | e-Navigation architecture and components | 2 |
|  | **4d.4** |  | **Tide Gauges and Current Meters** |  | | | |
|  |  | 4d.4.1 | Real versus predicted tidal heights | 2 |  | NAVGUIDE 4.32; 6.7 | 43 |
|  |  | 4d.4.2 | The International Ocean Commission (IOC) | 1 |
|  |  | 4d.4.3 | Tidal gauges |
|  |  | 4d.4.4 | Current meters and the use of buoy platforms |
|  | **4d.5** |  | **Structures and Materials** |  | | | |
|  |  | 4d.5.1 | Types of material | 3 | External visit to AtoN maintenance facility  Visit by coatings expert | IALA GL 1007; 1036; 1061; IALA GL 1076 | 44 |
|  |  | 4d.5.2 | Corrosion and its prevention |
|  |  | 4d.5.3 | Weathering of stone and concrete | 1 |
|  |  | 4d.5.4 | Protection and preservation | 2 |
|  | **4d.6** |  | **Remote Control and Monitoring** |  | | | |
|  |  | 4d.6.1 | Methods to monitor AtoN | 2 |  | IALA GL 1008 | 45 |
|  |  | 4d.6.2 | Remote monitoring technologies |
|  |  | 4d.6.3 | Use of AIS Messages 6 and 21 |

**MODULE 5 POWER SUPPLY**

**DETAILED TEACHING SYLLABUS FOR MODULE 5 – POWER SUPPLY**

*Table 13: Detailed Teaching Syllabus for Module 5*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module** | **Element** | **Sub-element** | **Subject** | **Level of Competence** | **Recommended training aids; exercises and external visits** | **References**  Rec = Recommendation  GL = Guideline | **Lecture No.** |
| **5** |  |  | **POWER SUPPLY** |  | | |  |
|  | **5.1** | **Types of Power Supply** |  | | | |
|  |  | 5.1.1 | Non-electrical energy sources | 2 |  | NAVGUIDE Chapter 7  IALA GL 1067-0 to 1067-3 | 46 |
|  |  | 5.1.2 | Electric energy sources |
|  |  | 5.1.3 | Silicon solar cells | 3 |
|  |  | 5.1.4 | Wind and wave electrical generators | 1 |
|  |  | 5.1.5 | Diesel and petrol generators |
|  | **5.2** |  | **Rechargeable Batteries** |  | | | |
|  |  | 5.2.1 | Lead-acid batteries | 3 |  | IALA GL 1044 | 47 |
|  |  | 5.2.2 | Lithium; nickel-hydride; lithium-iron-phosphate batteries |
|  |  | 5.2.3 | Disposal of batteries | 4 |
|  | **5.3** |  | **Electrical Loads** |  | | | |
|  |  | 5.3.1 | Methodology for calculating and defining load profiles | 2 | Practical use of an Excel Spreadsheet | IALA GL 1039 | 48 |
|  | **5.4** |  | **Lightning Protection** |  | | |
|  |  | 5.4.1 | Protection of AtoN structures and equipment | 2 |  | IALA GL 1012 |