



IALA

TECHNICAL DOCUMENTS CATALOGUE

ED 8.0 • MARCH 2025

*Successful voyages,
Sustainable planet.*

Lingao Lighthouse, China



IALA



SECRETARY-GENERAL'S MESSAGE

IALA serves as a forum for Marine Aids to Navigation authorities, manufacturers, service providers, and scientific and training organizations to discuss topics of common interest.

Members have the opportunity to collaborate in developing guidance documents to ensure the safe, harmonized and efficient movement of vessels while protecting the environment.

As of August 22, 2024, IALA has officially transitioned from a non-governmental organization to an Intergovernmental Organization and is now the International Organization for Marine Aids to Navigation.

This transition enables IALA to collaborate more effectively with governments and other intergovernmental organizations. Most importantly, it reinforces IALA's position as the leading international technical authority in its field, significantly enhancing global recognition of its work and the standards it seeks to establish. In turn, this will foster greater harmonization of Marine Aids to Navigation and related services worldwide.

The continued strong participation of our industrial members will ensure that the crucial link between Marine Aids to Navigation authorities, manufacturers and service providers remains strong, preserving the high quality and integrity of our work.

The purpose of this booklet is to provide a comprehensive overview of the full suite of publications produced by IALA, including standards, recommendations, guidelines, manuals, and training courses.

I trust you will find this booklet valuable for your work, studies, or research.

Francis Zachariae
Secretary-General

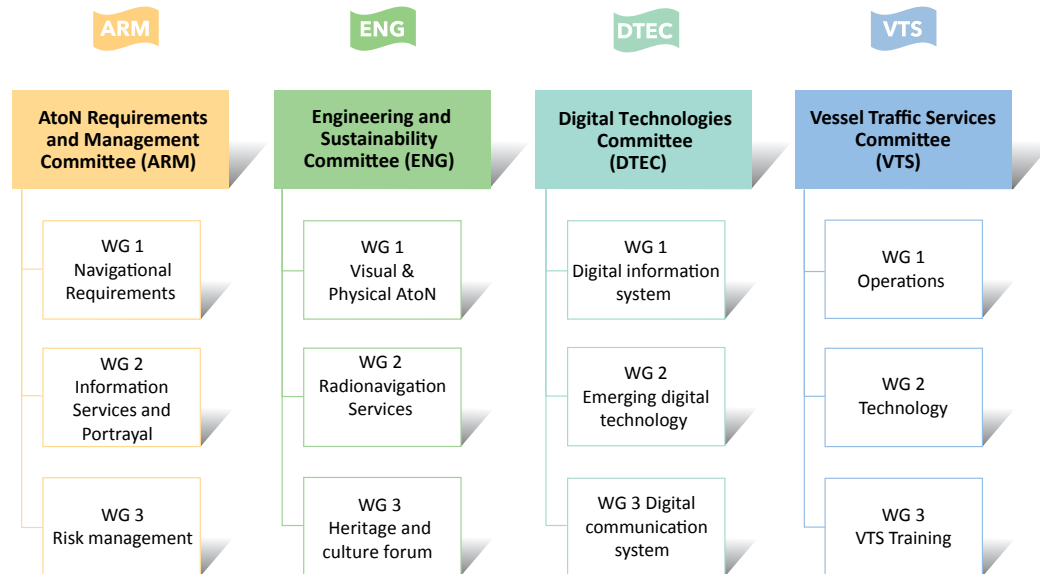


IALA TECHNICAL GUIDANCE

IALA's technical committees are the "engine room" of the organization. They comprise Marine AtoN authorities, subject matter experts, manufacturers and consultants from around the world, who collaborate to develop a wide variety of guidance.

Participation in the work of the committees offers the opportunity to:

- Contribute expertise and compare experiences with other IALA members;
- Exchange views with peers in the international maritime community;
- Participate in the development of guidance on new systems and technologies;
- Learn of new developments; and
- Meet with suppliers or customers and contribute to the development of best practice for systems and services.



IALA GUIDANCE DOCUMENTS HIERARCHY

1. Standards

IALA standards are a part of a framework, the implementation of which by all coastal states will harmonise Marine Aids to Navigation worldwide. IALA standards cover technology and services and are non-mandatory.

2. Recommendations

IALA recommendations specify what practices shall be carried out in order to comply with that recommendation, and may be referenced, in full or in part, in an IALA standard.

3. Guidelines

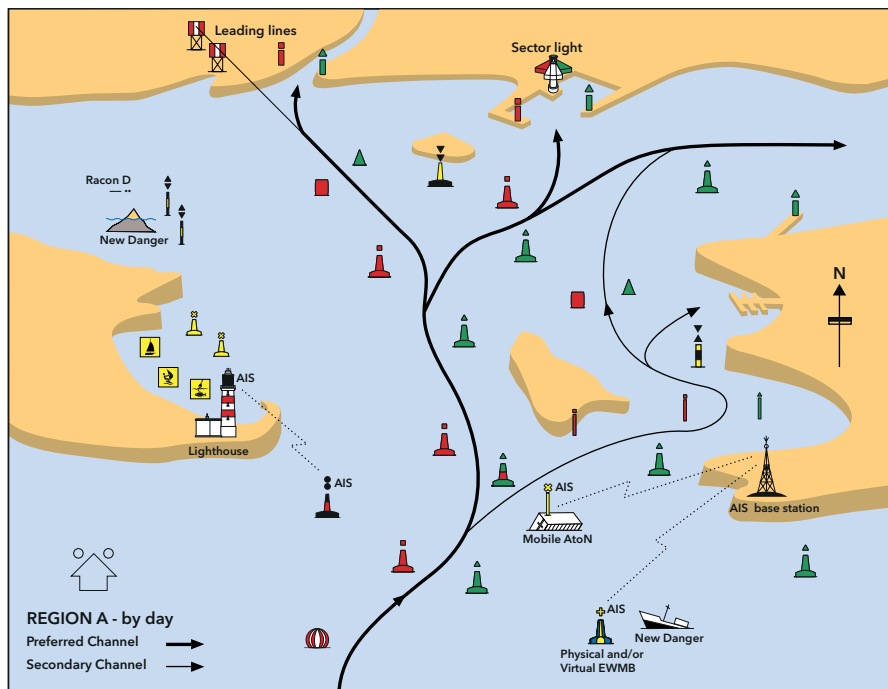
IALA guidelines describe how to implement practices normally specified in a Recommendation.

4. Manuals

Manuals give a detailed overview of a specific topic. Currently this includes: NAVGUIDE; VTS Manual; Complementary Lighthouse Use Manual; and MarCom Manual.

5. Other appropriate papers (Model courses)

IALA publishes three categories of model course for VTS personnel, Aids to Navigation Managers and Aids to Navigation Technicians.



IALA STANDARDS

IALA standards are suitable for implementation by all Marine Aids to Navigation authorities.



STANDARD 1010

MARINE ATON PLANNING AND SERVICE REQUIREMENTS

- 1.1 Obligations and Regulatory Compliance
- 1.2 Aids to Navigation Planning
- 1.3 Levels of Service (objective, availability and categories)
- 1.4 Risk Management
- 1.5 Quality Management



STANDARD 1020

MARINE ATON DESIGN AND DELIVERY

- 2.1 Aids to Navigation Visual Signalling
- 2.2 Design, Implementation, and Maintenance
- 2.3 Floating Aids to Navigation
- 2.4 Environment and Sustainability
- 2.5 Power Systems
- 2.6 Heritage and Culture



STANDARD 1030

RADIONAVIGATION SERVICES

- 3.1 Satellite Positioning and Timing
- 3.2 Terrestrial Positioning and Timing
- 3.3 Augmentation Services
- 3.4 Racon and Radar Positioning



STANDARD 1040

VESSEL TRAFFIC SERVICES

- 4.1 VTS Implementation
- 4.2 VTS Operations
- 4.3 VTS Communications
- 4.4 VTS Auditing and Assessing
- 4.5 VTS Data and Information Management
- 4.6 VTS Technologies
- 4.7 VTS Additional Services



STANDARD 1050

TRAINING AND CERTIFICATION

- 5.1 Training and Assessment
- 5.2 Accreditation, Competency, Certification and Revalidation
- 5.3 Capacity Building



STANDARD 1060

DIGITAL COMMUNICATION TECHNOLOGIES

- 6.1 Wide and Medium Bandwidth Systems
- 6.2 Narrow Bandwidth Systems
- 6.3 Harmonised Maritime Connectivity



STANDARD 1070

INFORMATION SERVICES

- 7.1 Data Models and Data Encoding
- 7.2 Data Exchange Systems
- 7.3 Terminology, Symbology and Portrayal

Superseded documents and publications are available on request to the secretariat, contact@iala.int





S1010 MARINE ATON PLANNING AND SERVICE REQUIREMENTS

1.1 Obligations and Regulatory Compliance

1.1.1. AtoN Awareness for Mariners

No	N/I	Date	Title	Ed	Summary
<u>R1021</u> 	Nor	Jan 2022	Marine Aids to Navigation Awareness for Mariners	1.1	Recommends authorities draw the attention of those involved in maritime training to the contents of this recommendation.
<u>G1173</u> 	Dec 2022	Marine AtoN Awareness and Training for Mariners	1.0	Presents information on AtoN training and awareness, to be taken into consideration by training organizations. It aims to enhance mariners' understanding of AtoNs. The Guideline also provides examples of tools that could be used to facilitate effective communication.	

1.1.2. IMSAS

No	Date	Title	Ed	Summary
<u>G1054</u> ARM	Dec 2021	Preparing for an IMO Audit on AtoN Service Delivery	2.0	Guidance to assist with initial preparations for an audit under the International Maritime Organization (IMO) Member State Audit Scheme (IMSAS). It includes information on the pre-audit questionnaire and associated checklist.

1.2 Marine Aids to Navigation Planning

1.2.1. Maritime Buoyage System and Fairway Design

No	N/I	Date	Title	Ed	Summary
<u>R1001</u> ARM	Nor	Dec 2022	IALA Maritime Buoyage System	2.0	Recommends authorities providing marine aids to navigation comply with the IALA Maritime Buoyage System.

No	Date	Title	Ed	Summary
<u>G1078</u> ARM	Dec 2021	Use of AtoN in the Design of Fairways & Channels	2.1	Guidance on the use of AtoN in the design of fairways including dredged channels and canals, and review of existing AtoN in the area.

1.2.2. Port Traffic Signals

No	N/I	Date	Title	Ed	Summary
<u>R0111</u> ENG	Nor	Dec 2019	Port Traffic Signals	1.3	Recommends principles and rules for port traffic signals.

1.2.3. Marking Bridges and Structures

No	N/I	Date	Title	Ed	Summary
<u>R0113</u> ARM	Nor	Dec 2011	Marking of Fixed Bridges and other Structures over Navigable Waters	2.1	Recommends the marking of fixed bridges and other structures over navigable waters, conform to the standards and practices stated.

No	Date	Title	Ed	Summary
<u>G1163</u> ARM	Dec 2021	Marking of Breakwaters and Barriers	1.1	Guidance on the marking of exposed and submerged breakwaters.
<u>G1172</u> ARM	Dec 2022	Marking of Bridges and other Structures over Navigable Waters	1.1	Guidance for the marking of bridges and other structures over navigable waters. It outlines the basic requirements and provides a number of examples.



1.2.4. Marking Offshore Structures

No	N/I	Date	Title	Ed	Summary
<u>R0139</u> ARM	Nor	Dec 2021	Marking of Man-Made Offshore Structures	3.0	Recommends members ensure the marking of man-made structures conforms to the standards and practices specified in IALA guidelines.

No	Date	Title	Ed	Summary
<u>G1162</u> ARM	Dec 2021	Marking of Offshore Man-Made Structures	1.1	Guidance for the marking of different types of offshore man-made structures (e.g. oil and gas pipelines, offshore wind farms).

No	Date	Title	Ed	Summary
<u>G1185</u> ARM	Dec 2024	Enhancing the safety and efficiency of navigation around offshore renewable energy installations (OREI)	1.0	Guidance on considering navigational safety issues in and around OREI. This document is intended to assist maritime authorities, OREI developers and other stakeholders when planning the establishment of OREI.

1.2.5. Marine Spatial Planning

No	N/I	Date	Title	Ed	Summary
<u>R1010</u> ARM	Inf	June 2017	Involvement of Maritime Authorities in Marine Spatial Planning (MSP)	1.1	Recommends authorities involved in MSP follow the principles set out in the recommendation and associated guidance.

No	Date	Title	Ed	Summary
<u>G1121</u> ARM	June 2017	Navigational Safety within Marine Spatial Planning	1.2	Guidance on the main elements of a Marine Spatial Planning (MSP) process. It also provides information on the underlying navigation factors to be taken into account during a MSP process.

<u>G1033</u> ARM	Dec 2003	Provision of AtoN for Different Classes of Vessels Including High Speed Craft	1.1	Provides information on AtoN requirements for HSC and for assessing AtoN requirements for different classes of vessels.
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<u>G1079</u> ARM	Dec 2009	Establishing and Conducting User Consultancy by AtoN Authorities	1.1	Guidance to authorities that wish to establish and conduct user consultancy. It includes defining participants, phases of consulting and continuous improvement.
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1.2.6. Cost Comparison

No	Date	Title	Ed	Summary
<u>G1047</u> ARM	Dec 2005	Cost Comparison Methodology of Buoy Technologies	1.1	Guidance on the different considerations (i.e. materials, technologies, environment) when deploying buoys. It also offers guidance on conducting financial analysis.

1.2.7. Virtual AtoN

No	N/I	Date	Title	Ed	Summary
<u>R0143</u> ARM	Inf	June 2021	Provision of Virtual AtoN	2.0	Recommends authorities consider deploying virtual as required.

No	Date	Title	Ed	Summary
<u>G1081</u> ARM	June 2021	Provision of Virtual AtoN	2.1	Guidance on the benefits and limitations of virtual AtoN, including criteria for their use and application and delivery methods.

1.2.8. Use of Mobile AtoN

No	N/I	Date	Title	Ed	Summary
<u>R1016</u> ARM	Nor	Dec 2020	Mobile Marine AtoN (MAtoN)	2.0	Recommends the circumstances when authorities should use MAtoN.

No	Date	Title	Ed	Summary
<u>G1154</u> ARM	Dec 2020	Use of Mobile AtoN	1.1	Guidance when considering use of MAtoN to mark a moving or drifting hazard to navigation. It also explains the different types of MAtoN, their deployment, monitoring and discontinuation.



1.2.9. Cyber Security

No	N/I	Date	Title	Ed	Summary
<u>R1024</u> ARM	Nor	Dec 2022	Cybersecurity for the IALA Domains	1.0	Recommends improvement in the awareness of cyber security. Along with updating of risk management processes, business continuity plans and adopting of industry best practices.
<u>G1182</u> ARM	June 2024	Cyber Security specifics from an IALA perspective		1.0	Guidance on possible measures to be taken to mitigate cyber security risks in the IALA domain.

1.2.10. State of the Art Technologies

No	Date	Title	Ed	Summary
<u>G1178</u> ENG	Dec 2022	An Introduction to Artificial Intelligence (AI) from an IALA Perspective.	1.0	Guidance to develop an understanding of the advantages and risks of AI within the IALA domain. It also provides information managing this risk, noting the rapid growth of AI and its capabilities.
<u>G1179</u> ENG	Dec 2022	An Introduction to the Internet of Things (IOT) from an IALA Perspective.	1.0	Guidance for those undertaking testing, trials and/or deployment of IoT systems.

1.2.11. Emerging Technologies Template

No	Date	Title	Ed	Summary
<u>G1153</u> DTEC	Dec 2019	Template for the Review of Emerging Technologies for Possible use by IALA Members	1.1	Guidance on the evaluation of emerging digital technologies.

1.3 Levels of Service (Objective, Availability and Categories)

1.3.1. Categorisation and Availability

No	N/I	Date	Title	Ed	Summary
<u>R0130</u> ARM	Nor	Dec 2017	Categorisation and Availability Objectives for Short Range AtoN	3.1	Recommends authorities categorize their AtoN, including availability objectives, as set out in the recommendation.

No	Date	Title	Ed	Summary
<u>G1004</u> ARM	June 2017	Level of Service	3.0	Description and benefits of establishing the level of service for AtoN provision. How to develop LOS and calculate availability. Guidance on level of service provided by authorities. It also provides guidance to develop an appropriate level of service and to calculate availability.
<u>G1035</u> ENG	Dec 2004	Availability and Reliability of AtoN - Theory and Examples	2.1	Guidance on a method of calculating availability and reliability, with a view to enabling authorities to provide a cost-effective AtoN service.
<u>G1037</u> ARM	Dec 2009	Data Collection for AtoN Performance Calculation	2.1	Guidance on methods that can be used to collect information on the availability and reliability of AtoN equipment.

1.3.2. Off Station Signal

No	N/I	Date	Title	Ed	Summary
<u>R0104</u> ARM	Nor	June 2012	'Off Station' Signals for Major Floating Aids	2.1	Recommends actions by authorities when major floating aids are off station.



1.4 Risk Management

1.4.1. Risk Management Tools

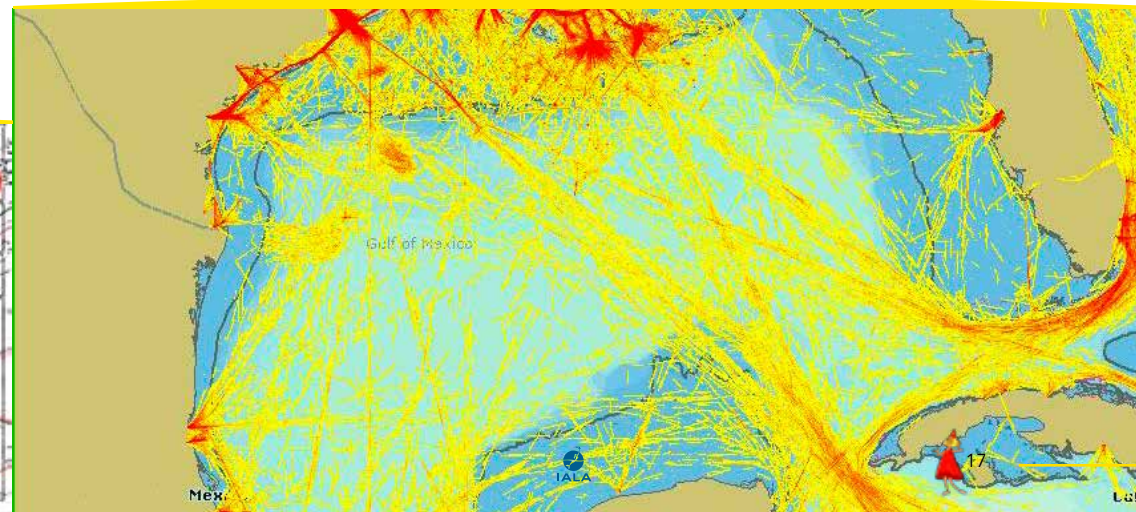
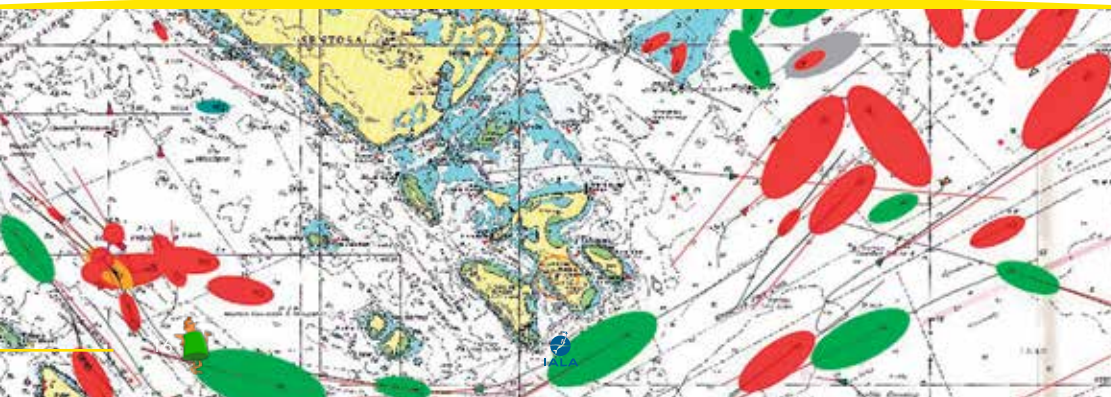
No	N/I	Date	Title	Ed	Summary
<u>R1002</u> 	Nor	June 2017	Risk Management for Marine AtoN	1.1	Recommends the use of risk management and IALA risk management tools when assessing risks in waterways.
No	Date	Title		Ed	Summary
<u>G1018</u> 	June 2022	Risk Management		4.0	Guidance to authorities for applying risk management to their activities. It provides a broad understanding of the risk management process and tools to conduct risk assessments.
<u>G1123</u> 	June 2022	Use of IALA Waterway Risk Assessment Programme (IWRAP MK II)		2.1	Guidance on the IWRAP methodology and its use to conduct risk assessments.
<u>G1124</u> 	June 2022	Use of Ports and Waterways Safety Assessment (PAWSA MK II) tool		2.1	Guidance on the PAWSA methodology and its use to conduct risk assessments.
<u>G1138</u> 	Dec 2022	Use of the Simplified IALA Risk Assessment Method (SIRA)		2.0	Guidance on SIRA's structured process to identify navigational hazards and undesirable scenarios in an area of interest, and to assess their probability and impact.
<u>G1104</u> 	Dec 2013	Application of Maritime Surface Picture for Analysis in Risk Assessment and the Provision of AtoN		1.1	Guidance on the use of GIS to assess the requirement and impact of AtoN in the area of interest. It covers use of charting overlays for danger identification and Automatic Identification System (AIS) data.

1.4.2. Maritime Data Sharing

No	N/I	Date	Title	Ed	Summary
<u>R0142</u> 	Inf	Dec 2009	Maritime Data Sharing 'IALA-NET'	1.1	Recommends authorities share their maritime data by participating in IALA-NET.
No	Date	Title	Ed	Summary	
<u>G1086</u> 	June 2012	Global Sharing of Maritime Data & Information	1.1	Guidance on relevant aspects for the exchange of global maritime data and information (i.e. terrestrial and satellite AIS).	

1.4.3. Simulation

No	N/I	Date	Title	Ed	Summary
<u>R0138</u> 	Inf	Dec 2007	Use of GIS and Simulation by AtoN Authorities	1.1	Recommends authorities providing marine AtoN use GIS and simulation based on the principles set out in IALA guidance.
No	Date	Title	Ed	Summary	
<u>G1057</u> 	Dec 2007	Use of Geographic Information Systems by AtoN Authorities	1.1	Guidance for the implementation and use of GIS to assist authorities in the planning and evaluation of the suitability and effectiveness of the provision of AtoN.	
<u>G1058</u> 	June 2022	Use of Simulation as a Tool for Waterway Design and AtoN Planning	3.0	Guidance on user requirements, simulation tools, analysis, reporting and documentation of results.	



1.4.4. Disaster Recovery

No	N/I	Date	Title	Ed	Summary
<u>R1009</u> ARM	Inf	June 2017	Disaster Recovery	1.1	Recommends authorities contribute to disaster recovery efforts by developing contingency plans based on generic situations.

No	Date	Title	Ed	Summary
<u>G1120</u> ARM	June 2017	Disaster Recovery	1.1	Guidance to Increase awareness of the benefits of developing disaster recovery plan. It includes actions that can be taken to restore service capability and guidance to overcome the difficulties after a disaster.

1.4.5. Marking Wrecks

No	N/I	Date	Title	Ed	Summary
<u>R1015</u> ARM	Nor	Dec 2017	Marking of Hazardous Wrecks	1.1	Recommends authorities mark hazardous wrecks taking into account IALA guidance.

No	Date	Title	Ed	Summary
<u>G1046</u> ARM	June 2019	Response Plan for the Marking of New Wrecks	2.1	Guidance to develop an Emergency Wreck Marking Plan (EWMP). Includes considerations and actions to take when marking a hazardous wreck.

1.5 Quality Management

1.5.1. Quality Management

No	N/I	Date	Title	Ed	Summary
<u>R0132</u> ARM	Nor	Dec 2024	Quality Management for AtoN Authorities	3.0	Recommends AtoN authorities implement and maintain a Quality Management System (QMS). Authorities should ensure ongoing integrity of the QMS by periodic certification.

No	Date	Title	Ed	Summary
<u>G1052</u> ARM	Dec 2013	Quality Management in AtoN Service Delivery	3.1	Guidance to develop a quality management system, including implementation and maintenance.

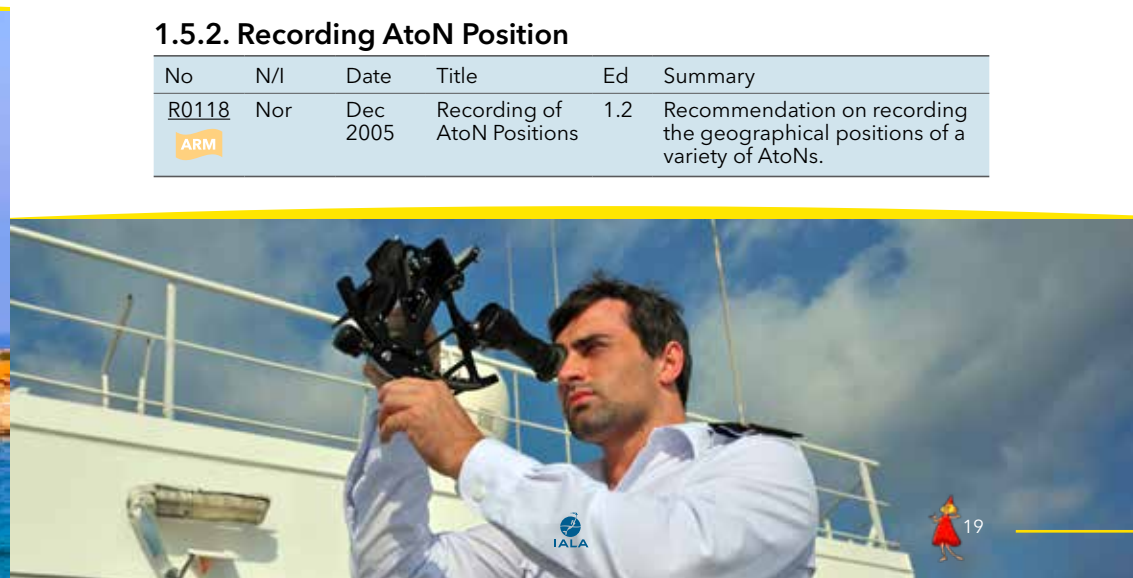
No	Date	Title	Ed	Summary
<u>G1133</u> ARM	June 2019	Requirement Traceability	1.1	Guidance to establish requirement traceability (i.e., the originator(s) of a requirement for any given technical feature that is implemented in a technical system).

No	Date	Title	Ed	Summary
<u>G1168</u> ENG	June 2022	Quality Control of Third-Party AtoN Service Providers	1.0	Guidance to contracting authorities on a framework to ensure third-party contractors provide acceptable engineering and maintenance services.

No	Date	Title	Ed	Summary
<u>G1005</u> ARM	Dec 2005	Contracting out AtoN Service	2.1	Guidance for authorities when considering contracting out AtoN services. It includes deciding whether to outsource, selecting a service provider and contract management..

1.5.2. Recording AtoN Position

No	N/I	Date	Title	Ed	Summary
<u>R0118</u> ARM	Nor	Dec 2005	Recording of AtoN Positions	1.2	Recommendation on recording the geographical positions of a variety of AtoNs.





S1020 MARINE ATON DESIGN AND DELIVERY

2.1 Aids to Navigation Visual Signalling

2.1.1. Retroreflecting Material

No	N/I	Date	Title	Ed	Summary
<u>R0106</u> ENG	Nor	June 2017	Retroreflecting Material on Aids to Navigation Marks within the IALA MBS	2.1	Recommends the use of the standard or comprehensive code for retroreflective material on AtoN.

No	Date	Title	Ed	Summary
<u>G1145</u> ENG	June 2019	Application of Retroreflecting Material on AtoN	1.1	Guidance to AtoN authorities and suppliers on retroreflective material, including terminology, design, characterising, classification and use for AtoN purposes.

2.1.2. Surface Colours

No	N/I	Date	Title	Ed	Summary
<u>R0108</u> ENG	Nor	Dec 2017	Surface Colours Used as Visual Signals on Marine AtoN	4.1	Recommends authorities adopt the system for surface colours set out in the annexes.

No	Date	Title	Ed	Summary
<u>G1134</u> ENG	June 2021	Surface Colours Used as Visual Signals on Marine AtoN	2.1	Guidance on the technical aspects of selecting surface colours. It includes specification of colours, measurement, weathering and colour collections

2.1.3. Rhythmic Characters

No	N/I	Date	Title	Ed	Summary
<u>R0110</u> ENG	Nor	June 2021	Rhythmic Characters of Lights on Marine AtoN	5.0	Recommendations for the rhythmic characters of lights.

No	Date	Title	Ed	Summary
<u>G1116</u> ENG	Dec 2016	Selection of Rhythmic Characters and Synchronization of Lights for AtoN	1.1	Guidance on the technical aspects of selecting the rhythmic characters. Includes selection of colours, the use of the fixed and flashing character and user considerations.

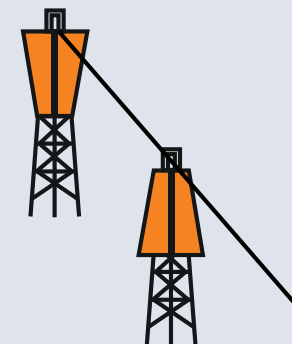
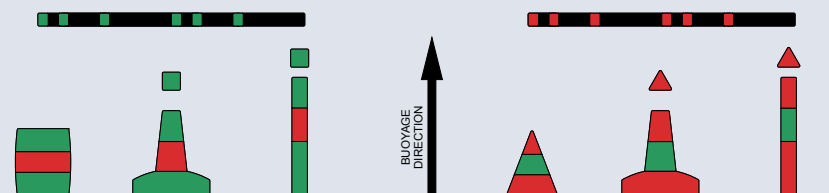
<u>G1038</u> ENG	Dec 2016	Method and Ambient Light Levels for the Activation of AtoN Lights	3.1	Guidance for authorities when selecting methods for activation of AtoN lights and measuring the ambient light levels at which AtoN lights should turn on and off.
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<u>G1043</u> ENG	Dec 2011	Light Sources Used in Visual AtoN	1.3	Guidance on light sources used in marine AtoN. It includes information on operational considerations, operating costs and power consumption.
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<u>G1048</u> ENG	Dec 2005	LED Technologies and Their Use in Signal Lights	1.1	The Guideline provides a brief overview of current LED technology and identifies specific issues w.r.t the design, specification and use of high-intensity LEDs in signal lights
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<u>G1061</u> ENG	Dec 2008	Light Application-Illumination of Structures	1.1	Guidance on the illumination of light structures for navigational aspects.
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<u>G1094</u> ENG	June 2016	Daymarks for AtoN	2.1	Guidance on the main factors that need to be considered when establishing a daymark.
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2.1.4. Leading Lights

No	N/I	Date	Title	Ed	Summary
<u>R0112</u> 	Nor	Dec 2005	Leading Lights	1.2	Recommends technical parameters for leading lights.
No	Date	Title		Ed	Summary
<u>G1023</u> 	Dec 2005	Design of Leading Lines		1.1	Guidance on the basics of leading line design, including design calculations (In Microsoft Excel).
<u>G1041</u> 	Dec 2015	Sector Lights		2.1	Guidance on the operational and technical considerations for sector lights.

2.1.5. Pictogram

No	Date	Title	Ed	Summary
<u>G1122</u> ARM	June 2017	Use of Pictograms on AtoN	1.1	Guidance on the application of pictograms on special marks.

2.1.6. Light Colours

No	N/I	Date	Title	Ed	Summary
<u>R0201</u> ENG	Nor	Dec 2017	Marine Signal Lights - Colours	3.1	Recommends authorities note the colour model specified and adopt the system for coloured light signals mentioned.

2.1.7. Light Calculation, Definition and Notation

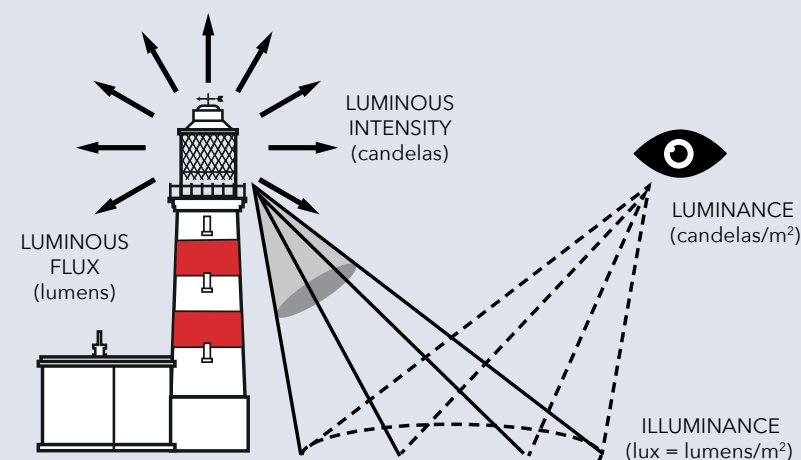
No	N/I	Date	Title	Ed	Summary
<u>R0202</u> 	Nor	Dec 2019	Marine Signal Lights - Calculation, Definition and Notation of Luminous Range	2.1	Recommends authorities design, specify and publish the performance of marine AtoNs in accordance with this recommendation.
No	Date	Title	Ed	Summary	
<u>G1148</u> 	Dec 2019	Determination of Required Luminous Intensity for Marine Signal Lights	1.1	Guidance to determine the light intensity to provide good service to users, whilst maintaining a balance between performance and cost.	

2.1.8. Light Measurement

No	N/I	Date	Title	Ed	Summary
<u>R0203</u> 	Inf	Dec 2022	Definition of Marine Signal Lights Terms and Measurement	2.0	Recommends authorities providing AtoN conduct photometric and colorimetric measurements of signal lights in accordance with this recommendation.
No	Date	Title	Ed	Summary	
<u>G1065</u> 	Dec 2021	AtoN Signal Light Beam Vertical Divergence	4.1	Guidance on specifying the vertical divergence of a lantern light for any given AtoN.	

2.1.9. Effective Intensity

No	N/I	Date	Title	Ed	Summary
<u>R0204</u> 	Nor	June 2022	Marine Signal Lights - Determination and Calculation of Effective Intensity	3.0	Recommends authorities use the modified Allard Method described for the determination and calculation of effective intensity of a rhythmic light
No	Date	Title	Ed	Summary	
<u>G1135</u> 	June 2022	Determination and Calculation of Effective Intensity	3.1	Guidance on calculating the effective intensity of a given flash of light (when viewed at the IALA defined illumination threshold for visual signalling).	



2.1.10. Estimation of Optic Performance

No	N/I	Date	Title	Ed	Summary
<u>R0205</u> ENG	Inf	Dec 2008	Marine Signal Lights - Estimation of the Performance of Optical Apparatus	1.1	Recommends authorities adopt methods to estimate the performance of optical apparatus.

No	Date	Title	Ed	Summary
G1073 ENG	Dec 2017	Conspicuity of AtoN Lights at Night	2.1	Guidance on the factors affecting the usefulness of a marine AtoN light and ways to improve its effectiveness by increasing conspicuity.

2.1.11. Range of Sound Signal

No	N/I	Date	Title	Ed	Summary
<u>R0109</u> ENG	Inf	June 1998	Calculation of the Range of a Sound Signal	1.1	Recommends authorities use the method described to calculate the range of a sound signal.

No	Date	Title	Ed	Summary
G1090 ARM	Dec 2012	Use of Audible Signals	1.1	Guidance on the use of audible signals to warn mariners of navigational hazards and their use to augment floating AtoN.

2.2 Design, Implementation and Maintenance

2.2.1. Use of AIS

No	N/I	Date	Title	Ed	Summary
<u>R0126</u> ARM	Inf	Dec. 2021	Use of the AIS in Marine AtoN Services	2.0	Recommends authorities use appropriate AIS units as part of their AtoN services for providing information to ships and for traffic monitoring.

No	Date	Title	Ed	Summary
G1082 DTEC	June 2016	Overview of AIS	2.1	Introduction to AIS for shore authorities and references relevant AIS documents.

G1062 DTEC	Dec 2008	Establishment of AIS as an AtoN	1.1	Guidance to assist AtoN authorities determine if AIS AtoN functionality should be provided and, if so, guidance to establish AIS AtoN.
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G1084 ARM	June 2011	Authorization of AIS AtoN	1.1	Provides information on a suggested procedure for the authorization of AIS AtoN.
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G1098 ENG	May 2013	On the Application of AIS AtoN on Buoys	1.1	Guideline on the application of AIS AtoN on buoys, including installation and maintenance.
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2.2.2. Responsible Design

No	N/I	Date	Title	Ed	Summary
R1018 	Inf	Dec 2019	Responsible Design, Operation and Maintenance in the Provision of Marine AtoN	1.1	Recommends national members implement systematic procedures for the design, maintenance and safe and sustainable operation of their AtoN.
No	Date	Title		Ed	Summary
G1165 	Dec 2021	Sustainable Structural Design of Marine Aids to Navigation		1.2	Guidance on the elements of AtoN structural design and the principles and practical application of structural design codes.
G1077 	Dec 2024	Maintenance of AtoN		2.0	Guidance to assist authorities develop an overall AtoN maintenance strategy. Several annexes provide detailed information on all aspects of maintenance.
G1008 	May 2009	Remote Control and Monitoring of AtoN		2.1	Guidance for members providing a system for the first time, replacing an existing system or updating a system. It advises on establishing the basic operational decision criteria and performance standards for AtoN systems.
G1012 	May 2013	Protection of Lighthouses and other AtoN Against Damage from Lighting		3.1	Guidance on a practical approach to risk assessment, design, installation, inspection and testing of lightning protection systems for AtoNs.
G1051 	Dec 2005	Provision and Identification of AtoN in Built up Areas		1.1	Guidance to assess the level of AtoN effectiveness in built-up areas and methods for improving the conspicuity of such AtoN.
G1091 	June 2019	Bird Deterrents and Bird Fouling Solutions		2.1	Guidance on the detrimental effects of bird fouling and the possible use of effective bird deterrents or alternative solutions
G1092 	Dec 2017	Safety Management for AtoN Activities		2.0	Guidance on managing safety in the AtoN workplace. Includes guidance on the standards and codes that support effective safety management.

<u>G1109</u> ENG	Dec 2013	Theft and Vandalism Deterrents	1.1	Guidance on theft and vandalism in the context of AtoNs. Includes details of the detrimental effects, and information on previous experiences of authorities.
<u>G1140</u> ENG	Dec 2017	Commissioning of AtoN Equipment and Systems	1.1	Guidance on commissioning, including identification of critical factors and responsibilities of authorities.
<u>G1151</u> ENG	Dec 2019	Maintenance of AtoN Structure	1.1	Guidance on the types of structures, component materials, maintenance, refurbishment and repair techniques.
<u>G1174</u> ENG	Dec 2022	Radar Reflectors on Marine Aids to Navigation.	1.0	Guidance on applicable international requirements and the theoretical principles of radar waves and their propagation. It also provides examples of radar reflectors in use and range calculations.

2.2.3. Harmonized waterways datasets

No	N/I	Date	Title	Ed	Summary
<u>R1025</u> 	Nor	Dec 20249	Harmonized waterways datasets	1.0	Recommends that National members and other appropriate Authorities providing marine aids to navigation services comply with IALA Guideline G1184.
<u>G1184</u> 	Dec 2024	Harmonized waterways datasets	1.0	Guidance on harmonizing waterways is a necessary development for the application of e-navigation to all segments of maritime, especially those segments which operate outside the SOLAS domain and are unlikely to adopt S-100 compliant systems.	



2.3 Floating Aids to Navigation

2.3.1. Overview of a floating AtoN

No	Date	Title	Ed	Summary
<u>G1186</u> ENG	Dec 2024	Overview of a floating AtoN	1.0	Guidance on the general overview to assist Competent Authorities, AtoN providers, and AtoN manufacturers when selecting floating AtoN for different purposes, depending on nautical, geographical, and operational requirements.

2.3.2. Moorings

No	N/I	Date	Title	Ed	Summary
<u>R0107</u> ENG	Inf	May 2009	Moorings for Floating AtoN	2.1	Recommendation on the design, capability and inspection of AtoN moorings.

No	Date	Title	Ed	Summary
<u>G1066</u> ENG	June 2010	Design of Floating AtoN Moorings	1.2	Guidance on AtoN mooring materials, including design and mooring components.

2.3.3. Plastic Buoy

No	Date	Title	Ed	Summary
<u>G1006</u> ENG	Dec 2018	Plastic Buoys	4.1	Guidance for selecting plastic buoys for different applications. Includes information on material types, manufacturing techniques and quality control considerations.

2.3.4. Buoy Painting

No	Date	Title	Ed	Summary
<u>G1015</u> ENG	Dec 2013	Painting AtoN Buoys	2.2	Guidance on painting steel, glass-reinforced plastic and moulded polyethylene buoys.

2.3.5. Buoy Design

No	Date	Title	Ed	Summary
<u>G1099</u> ENG	May 2013	Hydrostatic Design of Buoys	1.1	Guidance on the calculation of buoy stability for new buoy designs and the impact of installation of new equipment on existing buoys.

2.4 Environment and Sustainability

2.4.1. Environmental Management

No	N/I	Date	Title	Ed	Summary
<u>R1004</u> ENG	Nor	Dec 2019	Sustainability in the Provision of Marine AtoN	2.1	Recommends authorities endeavour to support the United Nations Sustainable Development Goals (SDGs) and implement formal systems to protect the marine environment and promote sustainability.

No	Date	Title	Ed	Summary
<u>G1036</u> ENG	June 2017	Environmental Management in AtoN	3.1	Guidance on the role of environmental management in an organisation's operations and technical, operational and legal considerations.
<u>G1137</u> ARM	Dec 2017	AtoN Management in Protected Areas	1.1	Guidance on the installation, on-going maintenance or removal of AtoN in marine protected areas.

2.4.2. Extreme Environmental Conditions

No	Date	Title	Ed	Summary
<u>G1175</u> ENG	Dec 2024	AtoN Equipment and Structures Exposed to Extreme Environmental Conditions.	2.0	Guidance on the effects of extreme environmental conditions on AtoN. Includes information on factors to consider to mitigate their effects.



2.5 Power systems

2.5.1. Solar Power Systems

No	Date	Title	Ed	Summary
<u>G1170</u> ENG	June 2022	Solar Modules for a Marine Environment	1.1	Guidance to select and apply solar modules to a power system in a marine environment. It includes information about factors influencing performance and reliability, application and purchasing.
<u>G1039</u> ENG	Dec 2017	Designing Solar Power Systems for AtoN (Solar Sizing Tool)	2.0	Guidance on the design of photovoltaic (PV) solar power systems and use of the IALA calculation tool. The tool is G1039-1 (Microsoft Excel spreadsheet). A handbook for meteorological data (to accompany G1039-1) is also available.

2.5.2. Integrated lanterns

No	Date	Title	Ed	Summary
<u>G1064</u> ENG	Dec 2008	Integrated Power System Lanterns (Solar LED Lanterns)	1.1	Guidance on integrated power system lanterns, including consideration on application criteria, limitations and other technical aspects.

2.5.3. Power System Selection

No	Date	Title	Ed	Summary
<u>G1067</u> ENG	Dec 2017	Selection of Power Systems for AtoN and Associated Equipment	3.1	Overall guidance to select and design power systems for AtoN. It includes a summary of available power generation and energy storage options. This guidance must be read in conjunction with: • G1067-1 (on total electrical loads of AtoN) • G1067-2 (on power sources) • G1067-3 (on electrical energy storage for AtoN).

2.6 Heritage and Culture

2.6.1. Lighthouse Conservation and Maintenance

No	N/I	Date	Title	Ed	Summary
<u>R1005</u> 	Inf	June 2017	Conserving the Built Heritage of Lighthouses and other AtoN	1.1	Recommends authorities responsible for AtoN of historical significance implement measures to promote conservation and maintenance of such AtoN, as part of the global lighthouse heritage for the benefit, pleasure and education of future generations.
No	Date	Title	Ed	Summary	
<u>G1049</u> 	Dec 2007	Use of Modern Light Sources in Traditional Lighthouse Optics	2.1	Guidance on methods of using modern light sources in traditional optic systems, outlining the advantages and disadvantages.	
<u>G1063</u> 	Dec 2008	Agreement for Complementary Use of Lighthouse Property	1.1	Guidance on developing agreements to permit complementary use of lighthouse properties.	
<u>G1080</u> 	Dec 2011	Selection and Display of Heritage Artefacts	1.1	Guidance on the selection and display historic artefacts, including examples from authorities around the world.	
<u>G1093</u> 	Dec 2012	Management of Surplus Lighthouse Property	1.1	Guidance on appropriate methods for the management or disposal of surplus lighthouse properties, so as to preserve the lighthouse heritage.	
<u>G1074</u> 	Dec 2009	Branding and Marketing of Historical Lighthouses	1.1	Guidance on the branding and marketing of heritage lighthouses. It includes examples from authorities around the world.	
<u>G1075</u> 	Dec 2009	Business Plan for the Complementary Use of a Historic Lighthouse	1.1	Guidance to develop a business plan for lighthouse estates when contemplating their development for complementary uses.	





S1030 RADIONAVIGATION SERVICES

3.1 Satellite Positioning and Timing

3.1.1. PNT

No	N/I	Date	Title	Ed	Summary
<u>R1017</u> ENG	Nor	Dec 2018	Resilient Position Navigation and Timing (PNT)	1.1	Recommends authorities conduct a risk assessment on the impact of PNT service degradation or total loss to their services and consider how PNT information can be made more resilient.

No	Date	Title	Ed	Summary
<u>G1180</u> ENG	Dec 2023	Resilient Position, Navigation and Timing	1.0	Guidance for members on assisting in understanding the vulnerabilities of PNT systems, the potential impacts of these vulnerabilities on AtoN services and VTS, their users, and exploring measures for enhancing PNT resiliency and mitigating risks associated with GNSS failures.

<u>G1181</u> DTEC	Dec 2023	VDES VHF Data Link (VDL) Integrity Monitoring	1.0	Guidance on a framework for identifying and addressing vulnerabilities in VDES VDL to enhance data reliability, focusing on detection, investigation, reporting, defense, and regulatory enforcement.
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<u>G1127</u> ENG	June 2022	Systems and Services for High Accuracy Positioning and Ranging	2.1	Guidance on a framework for identifying and addressing vulnerabilities in VDES VDL to enhance data reliability, focusing on detection, investigation, reporting, defense, and regulatory enforcement.
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3.1.2. GNSS

No	N/I	Date	Title	Ed	Summary
<u>R0129</u> ENG	Inf	Dec 2012	GNSS Vulnerability and Mitigation Measures	3.1	Recommends authorities take measures to mitigate the vulnerability of GNSS, including information on alternative systems.
<u>R1022</u> ENG	Nor	June 2021	Provision of GNSS Augmentation Service for Maritime Applications	1.0	Recommends authorities providing GNSS augmentation services for maritime use submit a formal declaration of their service as being adequate for maritime navigation (in the format provided in the Annex of the Recommendation).



3.2 Terrestrial Positioning and Timing

3.2.1. Terrestrial Radionavigation Systems

No	N/I	Date	Title	Ed	Summary
<u>R1020</u> ENG	Inf	Dec 2020	Terrestrial Radio-Navigation Systems	1.0	Recommends authorities consider the provision of terrestrial radionavigation systems which may include regional systems.

3.2.2. eLoran

No	N/I	Date	Title	Ed	Summary
<u>R1011</u> ENG	Nor	June 2017	Performance and Monitoring of eLORAN Services in the Frequency Band 90-110 kHz	1.1	Recommends authorities adhere to principles outlined when providing eLORAN services.

No	Date	Title	Ed	Summary
<u>G1125</u> ENG	June 2017	Technical Approach to Establishing a Maritime eLoran Service	1.1	Guidance for authorities to deliver, monitor and assess the performance of eLoran services in a common manner.

3.2.3. VDES R-Mode

No	Date	Title	Ed	Summary
<u>G1158</u> ENG	Dec 2024	VDES R-Mode	2.0	Guidance for authorities to establish VDES R-Mode; and for developers to design a VDES R-Mode hardware.
<u>G1187</u> ENG	Dec 2024	Medium Frequency R-Mode signal structure and navigation message	1.0	Guidance on specific information of the Medium Frequency (MF) R-Mode signal and the MF R-Mode navigation message.

3.3 Augmentation Services

3.3.1. Maritime Radionavigation Service

No	N/I	Date	Title	Ed	Summary
<u>R0115</u> ENG	Nor	Dec 2005	Provision of Maritime Radionavigation Services in the Frequency Band 283.5-315 kHz in Region 1 and 283-325 kHz in Regions 2 and 3	1.2	Recommends authorities consider the provision, or enhancement, of DGNSS services in the frequency band 283.5-315 kHz in Region 1 and 285-325 kHz in Regions 2 and 3 to improve the safety of navigation.

No	Date	Title	Ed	Summary
<u>G1016</u> ENG	Dec 2005	Bilateral Agreements Inter-Agency Memorandums of Understanding on the Provision of DGNSS Services in the Frequency band 283.5-325 kHz	1.2	Guidance by way of examples of bilateral agreements and an inter-agency MoU, that set out the responsibilities of the countries and agencies concerned. It includes procedures necessary to maintain the service for use in areas where stations located in 2 or more countries provide a DGNSS service.



3.3.2. Performance and Monitoring DGNSS

No	N/I	Date	Title	Ed	Summary
R0121 	Nor	May 2015	Performance and Monitoring of DGNSS Services in the Frequency Band 283.5-325 kHz	2.1	Recommends authorities providing a DGNSS adopt the principles listed.
No	Date	Title		Ed	Summary
G1112 	May 2015	Performance and Monitoring of DGNSS Services in the Frequency Band 283.5-325 kHz		1.1	Guidance on the design and implementation principles for the performance and monitoring of DGNSS services.
G1119 	Dec 2016	Marine Beacon Coverage Prediction		1.1	Guidance on calculating the expected signal strength of a single radiobeacon under different conditions.
G1126 	June 2017	Calculation of DGNSS Antenna Efficiency		1.1	Guidance to assist DGNSS service providers to establish correct output signal levels from LF/MF transmitter stations and measure antenna efficiency.

3.3.3. Future of DGNSS

No	N/I	Date	Title	Ed	Summary
<u>R0135</u> ENG	Inf	Dec 2008	Future of DGNSS	2.1	Recommends authorities providing or intending to provide DGNSS services in the band 283.5-325 kHz, implement the strategy outlined.

No	Date	Title	Ed	Summary
<u>G1060</u> ENG	June 2011	Recapitalization of DGNSS	2.1	Guidance on the recapitalization of existing DGNSS systems prior to their obsolescence, including options for replacement systems.

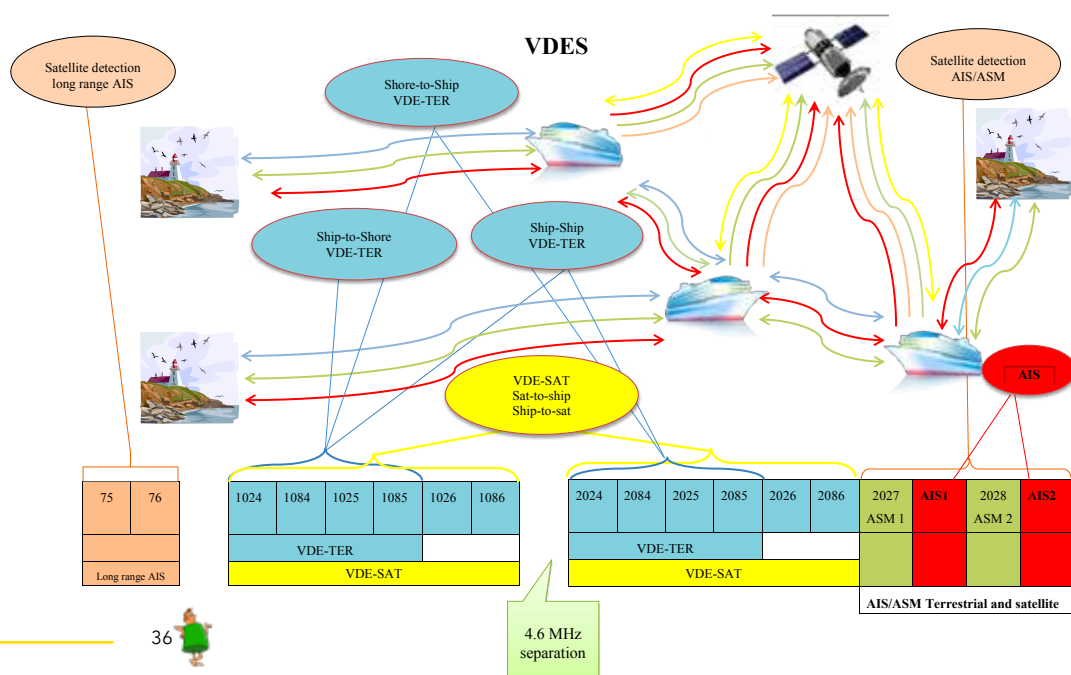
3.3.4. DGNSS Service Provision

No	N/I	Date	Title	Ed	Summary
<u>R0150</u> ENG	Inf	Dec 2016	DGNSS Service Provision, Upgrades and Future Uses	1.1	High level Recommendation on the provision of DGNSS services in the frequency band 283.5-315 kHz in Region 1 and 285-325 kHz in Region 2 and 3.

No	Date	Title	Ed	Summary
<u>G1053</u> ENG	Nov 2006	Template for the Submission of a DGNSS Service for Recognition as a Component of the IMO WWRNS	1.0	Guideline provides a template for the submission of a DGNSS service for recognition as a component of the IMO World-Wide Radionavigation Service (WWRNS).

3.3.5. SBAS

No	Date	Title	Ed	Summary
<u>G1129</u> ENG	June 2022	Retransmission of SBAS Corrections Using MF Radiobeacon and AIS	2.1	Guidance for AtoN service providers to evaluate areas where SBAS could be used to aid marine navigation by augmentation via marine radio beacon and AIS transmissions.
<u>G1152</u> ENG	Dec 2019	SBAS Maritime Service	1.1	Guidance for authorities when considering the use of SBAS by ships in their waters. It includes a description of all elements relevant to the maritime use of SBAS.



3.4 RACON and Radar Positioning

3.4.1. RACON

No	N/I	Date	Title	Ed	Summary
<u>R0101</u> ENG	Nor	Dec 2004	Marine Radar Beacons (RACONS)	2.1	Recommends racons provided by authorities conform to the technical characteristics provided.
<u>R0146</u> ENG	Nor	Dec 2011	Strategy for Maintaining RACON Service Capability	1.1	Recommends authorities follow the strategy for existing and future racon services provided.

No	Date	Title	Ed	Summary
<u>G1010</u> ENG	June 2005	RACON Range Performance	2.1	Guidance to estimate racon ranges, including examples.

3.4.2. ERPS

<u>G1147</u> ENG	June 2022	The Use of Enhanced Radar Positioning Systems	1.1	Guidance introduces ERPS and outlines the practical issues with their establishment and adoption.
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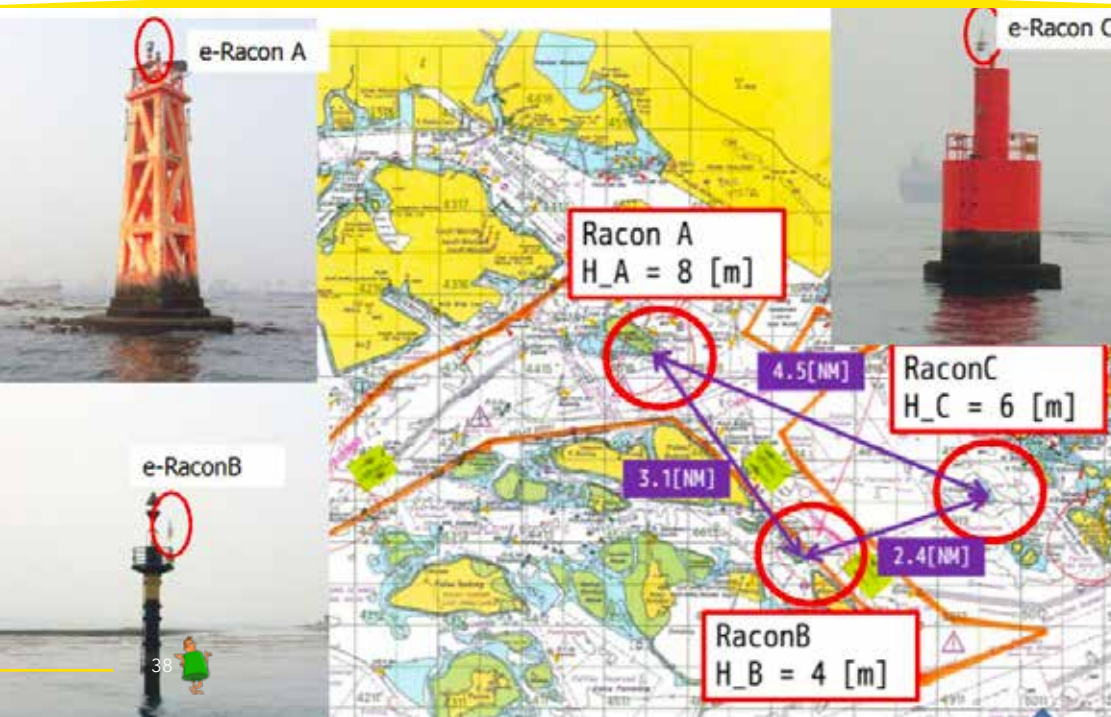
S1040 VESSEL TRAFFIC SERVICES

4.1 VTS Implementation

4.1.1. VTS Planning

No	N/I	Date	Title	Ed	Summary
<u>R0119</u> VTS	Nor	June 2022	Establishment of a VTS	4.2	Recommends authorities and VTS providers consider IALA standards and associated guidance related to the establishment and operation of VTS, so as to contribute to achieving worldwide harmonization of VTS.

No	Date	Title	Ed	Summary
<u>G1083</u> VTS	Jan 2022	Standard Nomenclature to Identify and Refer to VTS	1.1	Guidance to promote consistent nomenclature amongst VTS around the world.
<u>G1150</u> VTS	June 2022	Establishing, Planning and Implementing a VTS	3.1	Guidance that provides a framework to assist authorities implement practices specified in IALA Recommendation R0119 on the establishment of VTS.
<u>G1160</u> VTS	Jan 2022	Competencies for Planning and Implementing a VTS	1.2	Guidance for authorities to establish a VTS effectively, in a manner consistent with their international obligations under SOLAS and to conform with IALA Standards.
<u>G1171</u> VTS	June 2022	Human Factors and Ergonomics in VTS	1.1	Guidance that provides awareness of the role of the human factors in the performance of a VTS. It includes guidance to implement human factors training.



4.1.2. VTS Inland Waters

No	Date	Title	Ed	Summary
<u>G1166</u> VTS	Jan 2022	Vessel Traffic Services in Inland Waters	1.1	Guidance to assist authorities establish inland VTS in inland waters effectively and reflective of the international regulatory regime for VTS.

4.1.3. VTS Management

No	Date	Title	Ed	Summary
<u>G1167</u> VTS	Jan 2022	VTS Management	1.1	Guidance for VTS providers to facilitate the effective and efficient delivery of VTS and achieve its objectives.



4.2 VTS Operations

4.2.1. VTS Operation

No	N/I	Date	Title	Ed	Summary
<u>R0127</u> VTS	Nor	Jan 2022	VTS Operations	3.2	Recommends authorities contribute to precise and unambiguous delivery of VTS operations by implementing harmonised VTS operations.

No	Date	Title	Ed	Summary
<u>G1089</u> VTS	Jan 2022	Provision of VTS Services	2.0	Guidance on the provision of a VTS to participating ships in a harmonised manner.
<u>G1110</u> VTS	Jan 2022	Use of Decision Support Tools for VTS Personnel	2.1	Guidance on the use of decision support tools to manage identified risks, enhance situational awareness, and support VTS personnel.
<u>G1131</u> VTS	Jan 2022	Setting and Measuring VTS objectives	1.1	Guidance for authorities to set operational objectives for a VTS and achieve them.
<u>G1141</u> VTS	June 2024	Operational Procedures for Delivering VTS	3.0	Guidance on a framework for authorities to implement processes and procedures associated with the provision of VTS.
<u>G1144</u> VTS	Jan 2022	Promulgating the Requirements of a VTS to Mariners - a VTS Users Guide Template	1.1	Guidance for VTS authorities to promulgate information that will reduce the burden on ship masters (to obtain a VTS' requirements) and minimise confusion when moving from one VTS area to another.

4.2.2. Staffing Levels

No	Date	Title	Ed	Summary
<u>G1045</u> VTS	Jan 2022	Staffing Levels at VTS Centres	1.2	Guidance for authorities to determine an appropriate staffing level for a VTS centre.



4.2.3. Casualty and Incident Reporting and Recording

No	Date	Title	Ed	Summary
<u>G1118</u> VTS	Dec 2016	Marine Casualty/ Incident Reporting and Recording, Including Near-Miss Situations as it Relates to VTS	1.1	Guidance to VTS authorities on the development of harmonized casualty/incident/near-miss reporting, recording and analysis processes.

4.2.4. Safety Culture

No	Date	Title	Ed	Summary
<u>G1176</u> VTS	Dec 2022	How to Promote Safety Culture in VTS	1.1	Guidance to assist authorities and VTS providers to promote a safety culture. It describes the various elements and activities of a safety culture.

4.3 VTS Communications

4.3.1. VTS Communications

No	N/I	Date	Title	Ed	Summary
<u>R1012</u> VTS	Nor	Jan 2022	VTS Communications	1.2	Recommends authorities contribute to precise and unambiguous communications with traffic by implementing harmonized procedures and technology.

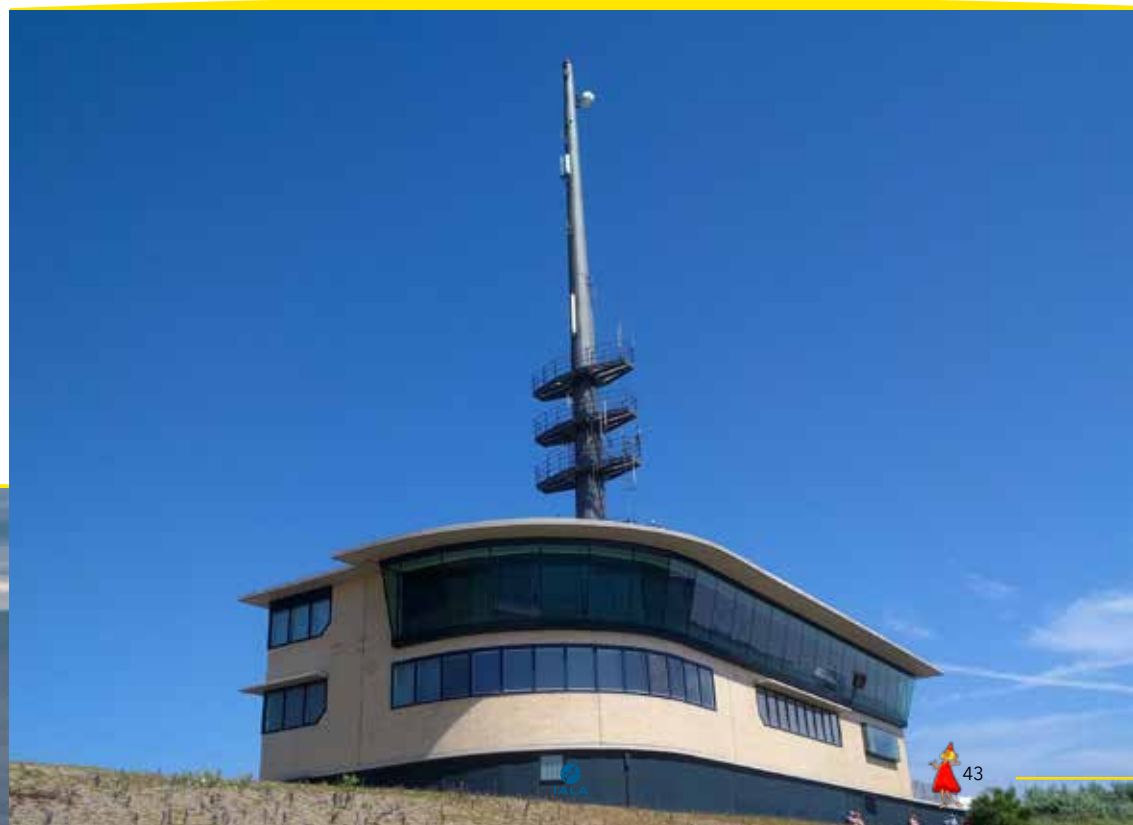
No	Date	Title	Ed	Summary
<u>G1132</u> VTS	Jan 2022	VTS Voice Communications and Phraseology	2.2	Guidance to assist authorities implement IALA recommended practices that ensure VTS communications are harmonized by using standard message structures and phrases.

4.4 VTS Auditing and Assessing

4.4.1. Auditing and Assessing VTS

No	N/I	Date	Title	Ed	Summary
<u>R1013</u> VTS	Nor	Dec 2017	Auditing and Assessing Vessel Traffic Services	1.1	Recommends implementation of a formal system for auditing and assessing VTS, to ensure the harmonized delivery of VTS worldwide.

No	Date	Title	Ed	Summary
<u>G1101</u> VTS	Jan 2022	Auditing and Assessing a VTS	1.1	Guidance for authorities to meet their obligations under SOLAS for the establishment and operation of VTS. It includes guidance for auditing and assessing a VTS.
<u>G1115</u> VTS	Jan 2022	Preparing for an IMO Member State Audit Scheme (IMSAS) on VTS	1.1	Guidance for authorities to meet the objectives of an IMO IMSAS for the implementation and delivery of VTS.



4.5 VTS Data and Information Management

4.5.1. Portrayal of VTS

No	N/I	Date	Title	Ed	Summary
<u>R0125</u> VTS	Nor	Dec 2022	VTS Portrayal	4.0	Recommends VTS portrayal focus on VTS tasks and follow human-centered design and ergonomic principles.

No	Date	Title	Ed	Summary
<u>G1177</u> VTS	June 2024	Portrayal of VTS Information	2.0	Guidance on the general principles for the presentation of symbology on a VTS display.

4.6 VTS Technologies

4.6.1. VTS Systems

No	N/I	Date	Title	Ed	Summary
<u>R0128</u> VTS	Nor	Dec 2022	VTS Systems and Equipment	5.0	Provides the framework to assist competent authorities when arranging for the establishment of the functional and performance requirements for VTS systems and equipment. Recommends competent authorities take into account IALA guidance when establishing functional and performance requirements for VTS systems and equipment.

No	Date	Title	Ed	Summary
<u>G1111</u> VTS	Dec 2022	Establishing Functional and Performance Requirements for VTS Systems and Equipment	2.0	Guidance to assist VTS authorities and providers develop functional and performance requirements for VTS systems. It is one of the G1111 series of guidelines, which address the relationship between the functional requirements and VTS system performance (technical) requirements.

<u>G1111-1</u> VTS	Dec 2022	Producing Requirements for the Core VTS System	1.0	Guidance to assist in preparing the functional requirements for the core VTS system. It focuses on the human aspects of the VTS system design including, user Interface, decision support, data processing and external information exchange.
<u>G1111-2</u> VTS	Dec 2022	Producing Requirements for Voice Communication	1.0	Guidance on VTS voice communication systems. It provides detailed information about functional and performance requirements regarding voice communication in VTS systems.
<u>G1111-3</u> VTS	Dec 2022	Producing Requirements for Radar	1.0	Guidance aims to assist VTS providers in the understanding of radar performance, support the design of a radar service and assist them in establishing appropriate radar functional, performance and other acceptance requirements.
<u>G1111-4</u> VTS	Dec 2022	Producing Requirements for AIS	1.0	Guidance to assist VTS providers understand AIS, support the design of an AIS service and its contribution to the VTS traffic image (situational awareness).
<u>G1111-5</u> VTS	Dec 2022	Producing Requirements for Environment Monitoring Sensors	1.0	Guidance to assist VTS providers understand environment monitoring sensors and their contribution to the VTS traffic image (situational awareness). It also provides guidance on how the VTS provider should specify functional and performance requirements.
<u>G1111-6</u> VTS	Dec 2022	Producing Requirements for Electro-Optical Systems	1.0	Guidance to assist VTS Providers understand Electro Optic / Thermal Sensors and their contribution to the VTS traffic image (situational awareness). It also provides guidance of how the VTS provider should specify functional and performance requirements.



No	Date	Title	Ed	Summary
<u>G111-7</u> VTS	Dec 2022	Producing Requirements for Radio Detection Finders	1.0	Guidance to assist VTS providers understand radio direction finders (RDF), inform the design of a RDF service and its contribution to the VTS traffic image (situational awareness). It also provides guidance on how the VTS provider should specify functional and performance requirements.
<u>G111-8</u> VTS	Dec 2022	Producing Requirements for Long Range Sensors	1.0	Guidance to assist VTS providers understand long range sensors and their contribution to the VTS traffic image (situational awareness). It also provides guidance on how the VTS provider should specify functional and performance requirements.
<u>G111-9</u> VTS	Dec 2022	Framework for Acceptance of VTS Systems	1.0	This sub-Guideline aims to assist competent authorities and VTS providers establish a framework for the acceptance of VTS systems and VTS equipment. Some customisations will be required to develop specific elements from the generic information included in this document.

4.6.2. Information Exchange

No	Date	Title	Ed	Summary
<u>G1130</u> VTS	Dec 2022	Technical Aspects of Information Exchange Between VTS and Allied or Other Services	2.0	Technical guidance on issues to be to be considered and the principles to be applied for interaction between VTS and allied or other services.

4.7 VTS Additional Services

4.7.1. Restricted or Limited Access Areas

No	Date	Title	Ed	Summary
<u>G1070</u> VTS	Jan 2022	VTS Role in Managing Restricted or Limited Access Areas	1.1	Guidance to assist VTS authorities define appropriate procedures to manage traffic in areas with navigation restrictions.

4.7.2. Interaction with Allied or Other Services

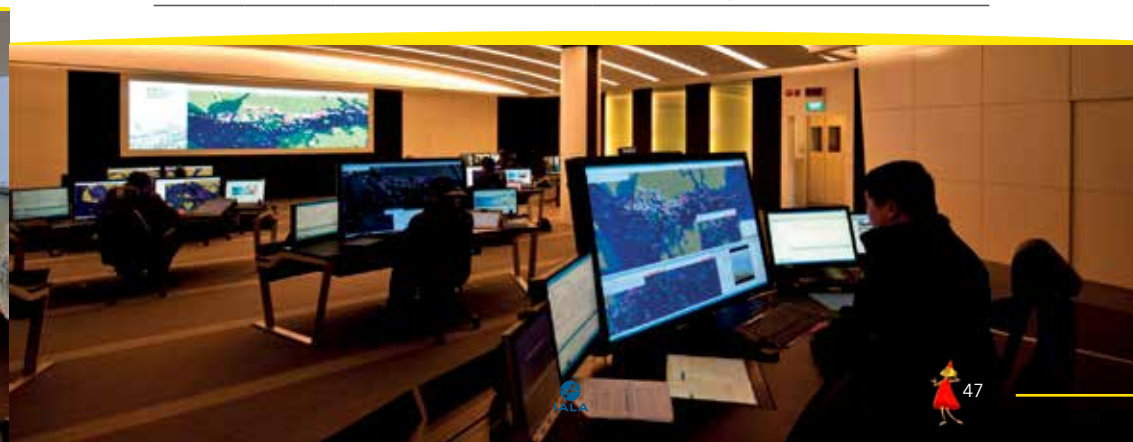
No	Date	Title	Ed	Summary
<u>G1102</u> VTS	Jan 2022	VTS Interaction with Allied or Other Services	1.1	Guidance on the issues to be considered for successful interaction between VTS and allied or other services.

4.7.3. Local Port Services

No	Date	Title	Ed	Summary
<u>G1142</u> VTS	Jan 2022	Provision of Local Port Services Other than a VTS	1.1	Guidance to assist authorities ensure the difference between a VTS and a local port service is clearly communicated to mariners, allied services and others.

4.7.4. Deck Officers

No	Date	Title	Ed	Summary
<u>G1149</u> VTS	Jan 2022	VTS Training for Deck Officers	1.0	Guidance and information to be used by maritime training organisations in the development of training on VTS (as an integral part of the training of deck officers).





S1050 TRAINING AND CERTIFICATION

5.1 Training and Assessment

5.1.1. VTS Training and Certification

No	N/I	Date	Title	Ed	Summary
<u>R0103</u> VTS	Nor	Jan 2022	Training and Certification of VTS personnel	3.1	Recommends authorities and VTS providers implement and establish VTS training and certification in a standardised and harmonised manner in accordance with the guidelines and model courses developed by IALA.

No	Date	Title	Ed	Summary
<u>G1017</u> VTS	June 2021	Assessment of Prior Learning Exemption for VTS Model Courses	2.1	Guidance to training organisations when developing a framework to assess and recognise the prior learning of students. The objective of the assessment is to grant exemptions from subject areas in an IALA model course.
<u>G1027</u> VTS	Jan 2022	Simulation in VTS Training	1.2	Guidance on simulation for VTS training including principles, planning, design, development, validation, documentation and conduct of simulation exercises.
<u>G1103</u> VTS	Dec 2013	Train the Trainer	1.1	Guidance to assist training organizations prepare and introduce new training courses for trainers, teachers and/or instructors.
<u>G1156</u> VTS	Jan 2022	Recruitment, Training and Certification of VTS Personnel	1.1	Guidance on implementing practices associated with the recruitment, training and assessment of VTS personnel.
<u>G1188</u> VTS	Dec 2024	Quality management practices for VTS providers	1.0	Guidance on implementing quality management practices consistent with the International Organization of Standardization (ISO). It describes the key elements in the ISO 9001 standard for implementing a QMS to assist VTS providers.

5.1.2. AtoN Training and Certification

No	N/I	Date	Title	Ed	Summary
<u>R0141</u> ENG	Nor	June 2022	Training and Certification of Marine AtoN Personnel	5.0	Recommends authorities and AtoN providers implement and establish AtoN training and certification in a standardized and harmonized manner in accordance with the guidelines and model courses developed by IALA.

No	Date	Title	Ed	Summary
<u>G1020</u> ARM	Dec 2005	Training Related to AtoN	1.2	Guidance on the delivery of life cycle management requirements for AtoN, including training.
<u>G1169</u> ENG	June 2022	Training and Certification of Marine Aids to Navigation Personnel	1.1	Guidance on implementing practices associated with the recruitment, training, and assessment of AtoN personnel.

5.2 Accreditation, Competency, Certification and Revalidation

5.2.1. Accreditation

No	N/I	Date	Title	Ed	Summary
<u>R0149</u> ARM	Nor	Dec 2016	Accreditation of Training Organizations	1.1	Recommends authorities consider accrediting and approving VTS and AtoN training organizations.

No	Date	Title	Ed	Summary
<u>G1014</u> VTS	Dec 2021	Accreditation of VTS Training Organizations and Approval to Deliver IALA VTS Model Courses	4.0	Guidance on the framework for authorities to accredit organizations to provide training based on IALA model courses; and approve their delivery of such courses.
<u>G1100</u> ENG	Dec 2017	Accreditation and Approval Process for AtoN Personnel Training	2.0	Guidance on the process by which AtoN training organisations can achieve accreditation and approval of their AtoN training.

5.3 Capacity Building

No documents yet





S1060 DIGITAL COMMUNICATION TECHNOLOGIES

6.1 Wide and Medium Bandwidth Systems

6.1.1. Provision Shore Based AIS

No	N/I	Date	Title	Ed	Summary
<u>R0123</u> DTEC	Nor	June 2007	Provision of Shore-Based AIS	2.1	Recommends authorities providing marine aids to navigation services adopt the provision of shore based AIS services in accordance with the principles set out in this recommendation.

No	Date	Title	Ed	Summary
<u>G1050</u> ARM	Dec 2005	Management and Monitoring of AIS Information	1.1	Guidance on information provided by AIS and use of historical AIS data for planning and evaluation process. Guidance is also provided on the design and implementation of AIS data storage and handling and processing systems.

6.1.2. AIS Service

No	N/I	Date	Title	Ed	Summary
<u>R0124</u> DTEC	Nor	Dec 2012	AIS Service	2.2	Recommends authorities introducing an AIS Service consider the information provided in the annex. There are twenty (0 to 19) appendices to the annex, provided as separate documents.
<u>R0124-0</u>	Nor	Dec 2012	AIS Service	1.1	Contains references, glossary of terms and abbreviations

<u>R0124-1</u>	Nor	Dec 2011	AIS Service	1.1	Basic AIS Services, AIS Data Model and AIS Service specific Maritime Data Exchange Format (MDEF) sentences
<u>R0124-3</u>	Nor	Dec 2012	AIS Service	1.1	Distribution model of the AIS Service (including relevant coverage planning aspects)
<u>R0124-4</u>	Nor	Dec 2011	AIS Service	1.1	Interaction and Data Flow Model of the AIS service
<u>R0124-5</u>	Nor	Dec 2011	AIS Service	1.0	Interfacing model of the AIS Service
<u>R0124-9-10-11</u>	Nor	Dec 2012	AIS Service	2.2	Functional Description of the AIS Service components
<u>R0124-12</u>	Nor	Dec 2012	AIS Service	1.1	Co-location issues at AIS Physical Shore Stations (AIS-PSS) and on-site infrastructure considerations
<u>R0124-14</u>	Nor	Dec 2011	AIS Service	2.1	FATDMA Planning and Operation of an AIS Service
<u>R0124-16</u>	Nor	Dec 2011	AIS Service	2.1	DGNSS Broadcasts from an AIS Service
<u>R0124-17</u>	Nor	Dec 2011	AIS Service	1.1	Channel Management by an AIS Service
<u>R0124-18</u>	Nor	Dec 2011	AIS Service	1.1	VDL load Management
<u>R0124-19</u>	Nor	Dec 2011	AIS Service	1.1	Satellite AIS considerations



6.1.3. VDES

No	N/I	Date	Title	Ed	Summary
<u>R1007</u> 	Nor	June 2024	VHF Data Exchange System (VDES) for Shore Infrastructure	2.0	Recommends authorities providing shore infrastructure for marine AtoN should plan to upgrade existing AIS to VDES shore infrastructure, so as to provide enhanced digital connectivity.

No	Date	Title	Ed	Summary
<u>G1117</u> 	Dec 2022	VHF Data Exchange System (VDES) Overview	3.0	Guidance on the VHF Data Exchange System (VDES). It gives information about the development of the VDES, its role within the e-Navigation concept of IMO, and the potential of VDES in the maritime environment.

6.2 Narrow Bandwidth Systems

No documents yet



6.3 Harmonised Maritime Connectivity

6.3.1. Shore Based Infrastructure Architecture

No	N/I	Date	Title	Ed	Summary
<u>R0140</u> 	Inf	May 2015	Architecture for Shore-Based Infrastructure “Fit for e-Navigation”	2.1	Recommends principles to consider for authorities when establishing shore-based infrastructure for e-Navigation.
No	Date	Title	Ed	Summary	
<u>G1113</u> 	May 2015	Design and Implementation Principles for Harmonized System Architectures of Shore-Based Infrastructure	1.1	Guidance on principles for the design and implementation of harmonized shore-based technical system architectures.	
<u>G1114</u> 	May 2015	Technical Specification for the Common Shore-Based System Architecture (CSSA)	1.0	Guidance or best practice representation of a system layout which was designed, amongst other reasons, as a system engineering response to the prompt for a common technical shore-based system harmonized for e-navigation.	

6.3.2. Regional e-Navigation Implementation

No	N/I	Date	Title	Ed	Summary
<u>R0148</u> DTEC	Inf	Dec 2015	Need to Implement Regional e-Navigation Solutions Based on International Standards	1.1	Recommends members and authorities providing, or intending to provide, e-navigation solutions, take into account the principles outlined.

6.3.3. Portrayal

No	Date	Title	Ed	Summary
<u>G1105</u> ARM	Dec 2022	Shore Side Portrayal Ensuring Harmonization with e-Navigation Related Information	2.0	Guidance on achieving a more synchronized presentation of information ashore with the presentation on-board ships.



S1070 INFORMATION SERVICES

7.1 Data Models and Data Encoding

7.1.1. Harmonized Implementation of ASM

No	N/I	Date	Title	Ed	Summary
<u>R0144</u> DTEC	Nor	June 2011	Harmonized implementation of Application Specific Messages (ASM)	1.1	Recommends members recognize urgency of the need for harmonization of content, encoding, application and portrayal of ASM.

No	Date	Title	Ed	Summary
<u>G1095</u> DTEC	May 2013	Harmonized Implementation of Application Specific Messages (ASM)	1.1	Guidance on implementing ASM in a harmonized manner, including guidance on operational and technical aspects.

7.1.2. Product Specification

No	N/I	Date	Title	Ed	Summary
<u>R0147</u> ARM	Nor	June 2017	Product Specification Development and Management	2.1	Recommends principles to be followed by authorities providing aids to navigation services when developing and managing product specifications.

No	Date	Title	Ed	Summary
<u>G1085</u> ARM	June 2012	Standard Format for Electronic Exchange of AtoN Product Information	1.1	Guidance on an electronic data format to prepare a standardized data file containing comprehensive AtoN product information.
<u>G1087</u> ARM	June 2017	Procedures for the Management of the IALA Domain under the IHO GI Registry	3.1	Guidance on the roles, responsibilities and procedures for IALA as a submitting organization under the IHO registry, based on IHO Standards S-100 and S-99.
<u>G1088</u> ARM	Dec 2012	Introduction to Preparing S-100 Product Specification	1.1	Guidance on the process of developing S-100 based Product Specifications.

<u>G1106</u> ARM	June 2017	Producing an IALA S-200 Product Specification	2.1	Guidance on an overview of the development process of a S-200 based product specification, including a step-by-step guide from data modelling to product specification. G1106-1 IALA PS number template G1106-2 Proposal for additional S-100 feature concept dictionary (FCD) item - the name of proposed FCM item G1106-3 PS under development- template
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7.1.3. Maritime Service

No	N/I	Date	Title	Ed	Summary
<u>R1019</u> ARM	Inf	June 2024	Provision of Maritime Services in the context of e-Navigation in the domain of IALA	2.0	Recommends IALA members provide maritime services in digital formats, use international standards and ensure a communications infrastructure is available in their area of responsibility.

No	Date	Title	Ed	Summary
<u>G1155</u> ARM	Dec 2020	Development of a Description of a Maritime Service in the Context of e-Navigation	1.1	Guidance to develop and implement a maritime service in the context of e-Navigation.
<u>G1161</u> ARM	June 2021	Evaluation of Platforms for the Provision of Maritime Services in the Context of e-Navigation	1.1	Guidance on the evaluation of harmonized and suitable platforms for the provision of AtoN services, including VTS, in the context of e-Navigation.
<u>G1096</u> ARM	May 2013	Anticipated user e-Navigation Requirements from Berth to Berth, for AtoN Authorities	1.1	Guidance for AtoN authorities on user requirements and applications of e-Navigation. Includes general requirements, communications, navigation and AtoN requirements.
<u>G1107</u> DTEC	Dec 2022	Planning and Reporting of Testbeds in the Maritime Domain	3.0	Guidance to promote the sharing of knowledge and experience gained in the development of test beds in the maritime domain. It addresses the design, planning and reporting of results from these test beds.
<u>G1183</u> DTEC	Dec 2024	Provision of MCP identities	1.1	Guidance on the requirements for providing and using secure identities by means of the Maritime Identity Registry (MIR) of the Maritime Connectivity Platform (MCP).



7.1.4. IVEF

No	N/I	Date	Title	Ed	Summary
<u>R0145</u> VTS	Nor	June 2011	Inter-VTS Exchange Format (IVEF) Service	1.1	Recommends authorities introducing an IVEF Service into their shore infrastructure, take into account the principles set out in the relevant IALA Guideline/s on the Inter-VTS Exchange Format (IVEF)

7.1.5. MRN

No	N/I	Date	Title	Ed	Summary
<u>R1023</u> ARM	Nor	June 2022	Maritime Resource Names (MRN)	1.0	Recommends members and authorities providing AtoN services observe the provisions in the IALA Guideline on the topic.

No	Date	Title	Ed	Summary
<u>G1143</u> ARM	June 2021	Unique Identifiers for Maritime Resources	3.1	Guidance describes a syntax for Maritime Resource Names (MRN) based on proven methods from the internet domain, that will enable IALA members to issue unique identifiers for objects such as AtoN, VTS products and services, waterways, etc.
<u>G1164</u> DTEC	Dec 2021	Management Of Maritime Resource Name Organisation Identifiers	1.1	Guidance on the procedures for IALA to process requests Organizational Identifiers (OID) and related namespaces within the MRN construct.

7.2 Data Exchange Systems

7.2.1. Web Service Based S-100 Data Exchange

No	Date	Title	Ed	Summary
<u>G1157</u> DTEC	Dec 2022	Web Service Based S-100 Data Exchange	2.0	Guidance to service providers, system architects and developers who are designing S-100 based technical service and implementing maritime services in the context of e-Navigation.

7.2.2. Technical Service

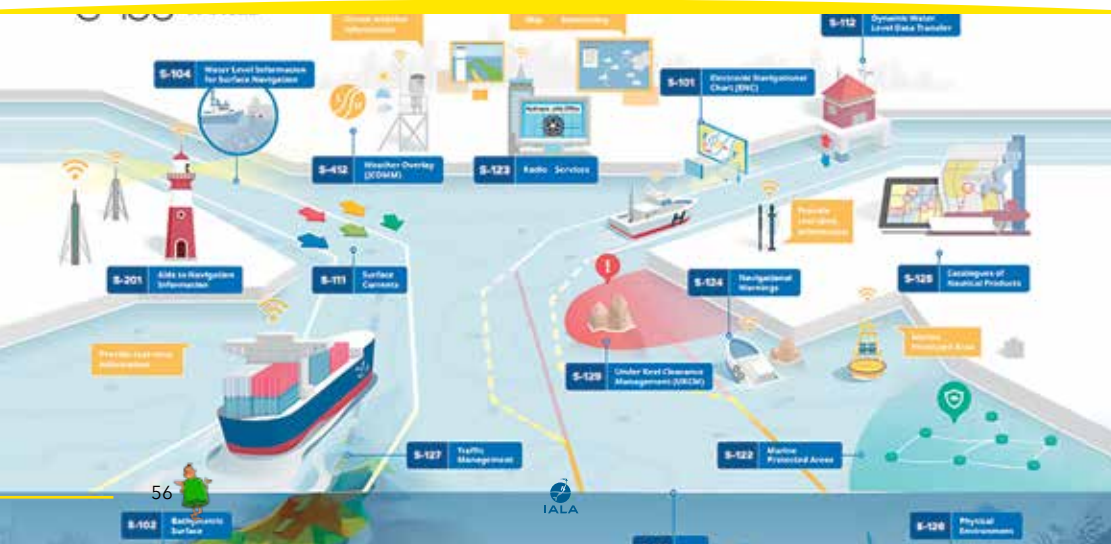
No	Date	Title	Ed	Summary
<u>G1128</u> DTEC	Dec 2024	Specification of e-Navigation Technical Services	1.6	Guidance to specify e-Navigation technical services. It is intended for service architects, system engineers and developers in charge of designing and developing a technical service.

7.2.3. Ship Reporting

No	Date	Title	Ed	Summary
<u>G1159</u> DTEC	Dec 2022	Ship Reporting From a Shore-Based Perspective	2.0	Guidance on approaches to facilitate harmonized ship reporting using digital systems. It describes systems that could be used by those who require ships to submit reports. It is intended to be used by authorities to assist them comply with IMO FAL Conventions and IMO resolutions on mandatory ship reporting and to automate processes and procedures both ashore and on board.

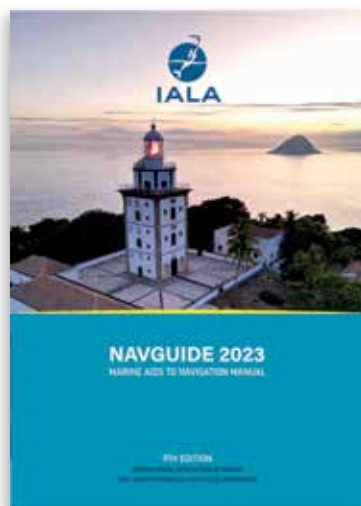
7.3 Terminology, Symbolology and Portrayal

No documents yet

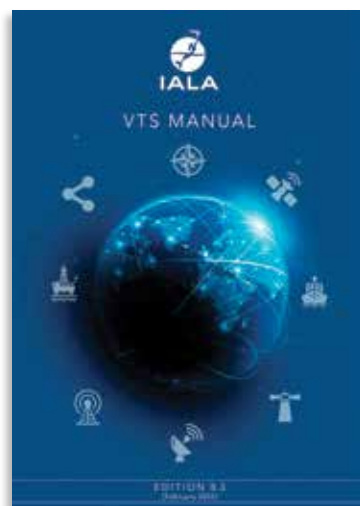


MANUALS

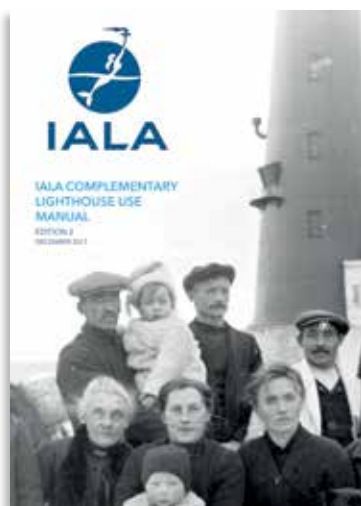
IALA MODEL COURSES



[IALA NAVGUIDE Ed.9.0 2023](#)



[VTS Manual Ed.8.3 2024](#)



[IALA complementary lighthouse use manual, Ed. 2.0 2017](#)



[Maritime Radio Communication \(MarCom\) Manual, Ed1.0 2024](#)

Aids to Navigation Management Training

Ref.	Edition	Title
C1001	Ed3.1 Dec 2019	L 1.1 - Marine Aids to Navigation - Manager Training <i>This model course is intended to provide national members and other authorities charged with the provision of AtoN services, specific guidance on the training of AtoN managers. It is intended to be delivered by a training organisation accredited by a national Competent Authority.</i>
C1002	Ed1.0 Dec 2018	L 1.2 - Master of Marine Aids to Navigation Management <i>This course is an extension of the IALA Level 1 AtoN Manager course. While the later course focuses on training on the operational, technical and managerial aspects of AtoN service provision at a practical level, this course is more theoretical. It addresses key aspects of AtoN governance from a strategic perspective.</i>
C1003	Ed3.0 June 2019	L 1.3 - Aids to Navigation Manager Training Level 1- Use of the IALA Risk Management Tools <i>This model course aids in providing training for marine aids to navigation managers and other interested parties with the theoretical and practical training necessary to have a satisfactory understanding of the three IALA risk management tools; IALA Waterway Risk Assessment Program (IWRAP Mk2); Port and Waterway Safety Assessment tool (PAWSA), Simplified IALA Risk Assessment Method (SIRA) and simulation.</i>
C1004	Ed2.0 Dec 2018	L 1.4 - Aids to Navigation Management Training Level 1 - Global Navigation Satellite Systems and e-Navigation <i>This model course includes a framework for providing training to managers and other interested parties so that they obtain a good understanding of GNSS and the e-navigation concept.</i>
C1005	Ed2.0 Dec 2018	L1.5 - Marine Aids to Navigation Management Training Level 1 - Module 5 - Historic Lighthouse Projects <i>This model course outlines the framework for providing managers of marine aids to navigation and other interested parties, the necessary theoretical training to manage projects involving historic lighthouses.</i>



Aids to Navigation Technician Training

Ref.	Edition	Title
<u>C2000</u>	Ed3.0 Jun 2016	Level 2 – Technician Training Model Course Overview
<u>C2001-1</u>	Ed1.0 Oct 2012	Level 2 – Technician Training Introduction to Aids to Navigation
<u>C2001-2</u>	Ed2.0 Jun 2016	Introduction to Aids to Navigation-Buoyage
<u>C2001-3</u>	Ed2.0 Jun 2016	Buoy Handling and Safe Working Practices
<u>C2001-4</u>	Ed3.0 Dec 2018	Buoy Moorings
<u>C2001-5</u>	Ed2.0 Jun 2016	Buoy Cleaning
<u>C2001-6</u>	Ed2.0 Jun 2016	Introduction to Buoy Positions
<u>C2001-7</u>	Ed2.0 Jun 2016	Maintenance of Plastic Buoys
<u>C2001-8</u>	Ed3.0 Dec 2021	Maintenance of Steel Buoys
<u>C2001-9</u>	Ed3.0 Dec 2021	Power Sources on Buoys
<u>C2001-10</u>	Ed2.0 Jun 2017	An Introduction to Shore Marks
<u>C2002-1</u>	Ed3.0 Dec 2018	DC Power Systems
<u>C2002-2</u>	Ed3.0 Dec 2018	Primary and Secondary Battery Maintenance
<u>C2002-3</u>	Ed3.0 Dec 2018	Photovoltaic (Solar Panel) Systems and Maintenance
<u>C2002-4</u>	Ed2.0 Jun 2017	Wind Generators
<u>C2002-5</u>	Ed2.0 Jun 2017	Mains AC Utility Power Systems; Diesel and Petrol Generators
<u>C2002-6</u>	Ed2.0 Jun 2017	Lightning Protection
<u>C2003-1</u>	Ed2.0 Dec 2016	Lights and Marine Lanterns
<u>C2003-2</u>	Ed2.0 Dec 2016	Light Flashers Lamp Changers and IPS Lanterns
<u>C2003-3</u>	Ed2.0 Dec 2016	Rotating Beacons and Classic Lenses
<u>C2003-4</u>	Ed2.0 Jun 2016	Maintenance of Mercury Rotating Optics
<u>C2003-5</u>	Ed2.0 Dec 2016	Range, Sector and Precision Direction Lights

<u>C2004-1</u>	Ed2.0 Dec 2016	Sound Signals
<u>C2005-1</u>	Ed2.0 Jun 2017	Introduction to Coatings and Specifications; Surface Preparation
<u>C2006-1</u>	Ed2.0 Jun 2016	Aids to Navigation Service Craft and Buoy Tenders
<u>C2007-1</u>	Ed3.0 Dec 2021	Radar Beacons (Racons) Maintenance
<u>C2008-1</u>	Ed2.0 Dec 2017	AIS Aids to Navigation Operations
<u>C2009-1</u>	Ed2.0 Jun 2016	Introduction to Radionavigation and DGNSS
<u>C2010-1</u>	Ed2.0 Dec 2017	Introduction to Remote Monitoring of Aids to Navigation
<u>C2011-1</u>	Ed2.0 Dec 2017	Marine Aids to Navigation Structures: Materials, Corrosion and Protection
<u>C2011-2</u>	Ed2.0 Dec 2017	Preservation of Structures
<u>C2011-3</u>	Ed2.0 Dec 2017	Maintenance Planning & Records

VTS

Ref.	Edition	Title
<u>C0103-1</u>	Ed3.0 Dec 2022	VTS Operators Training <i>The purpose of this model course is to assist training organizations deliver new training courses for VTS Operators. It provides guidance on the level of training and knowledge needed to reach levels of competence to obtaining a C0103-1 certificate.</i>
<u>C0103-2</u>	Ed3.0 Dec 2023	VTS Supervisor Training <i>The purpose of this model course is to assist maritime training organisations introduce new training courses for VTS Supervisors or update existing training material. It also provides details of the knowledge and practical competence required for a VTS Operator to gain endorsement as a VTS Supervisor.</i>
<u>C0103-3</u>	Ed3.0 Dec 2022	VTS On-the-Job Training <i>The purpose of this model course is to assist VTS providers establish and conduct on-the-job training. It provides guidance on the level of training and knowledge needed to reach levels of competence so as to obtain a C0103-3 endorsement.</i>
<u>C0103-4</u>	Ed3.0 Jun 2024	VTS On-the-Job Training Instructor <i>The purpose of this model course is to assist VTS centres deliver an On-the-Job Training (OJT) programme, including enhancing existing training material.</i>
<u>C0103-5</u>	Ed1.0 Jun 2016	The Revalidation Process for VTS Qualification and Certification <i>This Model Course is intended to provide guidance on how to maintain and improve the quality of performance of VTSOs, by means of training, so as to enable the revalidation of their qualifications.</i>



DOCUMENTS LIST

Standards

Ref.	Title
Standard S1010	Marine AtoN Planning and Service Requirement
Standard S1020	Marine AtoN Design and Delivery
Standard S1030	Radionavigation Services
Standard S1040	Vessel Traffic Services
Standard S1050	Training and Certification
Standard S1060	Digital Communication Technologies
Standard S1070	Information Services

Recommendations

Ref.	Edition	Title
R0101	Ed2.1	Marine Radar Beacons (RACONS)
R0103	Ed3.1	Training and Certification of VTS Personnel
R0104	Ed2.1	'Off Station' Signals for Major floating Aids
R0106	Ed2.1	Use of Retro-Reflecting Material on Aids to Navigation Marks Within the IALA Maritime Buoyage System
R0107	Ed2.1	Moorings for Floating Aids to Navigation
R0108	Ed4.1	The Surface Colours Used as Visual Signals on Marine Aids to Navigation (Specifications for Ordinary and Fluorescent Colours)
R0109	Ed1.1	The Calculation of the Range of a Sound Signal
R0110	Ed5.0	Rhythmic Characters on Marine Aids to Navigation
R0111	Ed1.3	Port Traffic Signals
R0112	Ed1.2	Leading Lights
R0112-1	Ed2.02	Microsoft Excel Spreadsheet for Calculations
R0113	Ed2.1	The Marking of Fixed Bridges and Other Structures Over Navigable Waters
R0115	Ed1.2	The Provision of Maritime Radionavigation Services in the Frequency Band 283.5-315 kHz in Region 1 and 285-325 kHz in Region 2 and 3

R0118	Ed1.2	The Recording of Aids to Navigation Positions
R0119	Ed4.2	Establishment of a VTS
R0121	Ed2.1	The Performance and Monitoring of a DGNSS Service in the Frequency Band 283.5 - 325 kHz
R0123	Ed2.1	The Provision of Shore Based AIS
R0124	Ed2.2	The AIS Service
R0124	Ed1.1	References, Glossary of Terms and Abbreviations
R0124-1	Ed1.1	Basic AIS Services, AIS Data Models and AIS Service Specific MDEF Sentences
R0124-3	Ed1.1	Distribution Model of the AIS Service (including Relevant Coverage Planning Aspects)
R0124-4	Ed1.1	Interaction and Data Flow Model of the AIS Service
R0124-5	Ed1.1	Interfacing Model of the AIS Service
R0124-9-10 & 11	Ed1.1	Functional Description of AIS Components (AIS-PCU, AIS-LSS & AIS-SM)
R0124-12	Ed1.1	Co-location Issues at AIS Physical Shore Stations (AIS-PSS) and On-Site Infrastructure Considerations
R0124-14	Ed2.1	FATDMA Planning and Operation of an AIS Service
R0124-16	Ed2.1	DGNSS Broadcasts from an AIS Service
R0124-17	Ed1.1	Channel Management by an AIS Service
R0124-18	Ed1.1	VDL Load Management
R0124-19	Ed1.1	Satellite AIS Considerations
R0125	Ed4.0	VTS Portrayal
R0126	Ed2.0	The Use of the AIS in Marine Aids to Navigation Service
R0127	Ed3.2	VTS Operations
R0128	Ed5.0	VTS Systems and Equipment
R0129	Ed3.1	GNSS Vulnerability and Mitigation Measures
R0130	Ed3.1	Categorisation and Availability Objectives for Short Range Aids to Navigation
R0132	Ed3.0	Quality Management for Aids to Navigation Authorities
R0135	Ed2.1	Future of DGNSS
R0138	Ed1.1	The Use of GIS and Simulation by Aids to Navigation Authorities
R0139	Ed3.0	The Marking of Man-Made Structures
R0140	Ed2.1	The Architecture for Shore-Based Infrastructure 'fit for e-Navigation'
R0141	Ed5.0	Training and Certification of AtoN Personnel
R0142	Ed1.1	Maritime Data Sharing 'IALA-NET'
R0143	Ed2.0	Provision of Virtual Aids to Navigation



R0144	Ed1.1	Harmonized Implementation of Application Specific Messages (ASM)
R0145	Ed1.1	The Inter-VTS Exchange Format Service
R0146	Ed1.1	Strategy for Maintaining Racon Service Capability
R0147	Ed2.1	Product Specification Development and Management
R0148	Ed1.1	The Need to Implement Regional e-Navigation Solutions Based on International Standards
R0149	Ed1.1	Accreditation of Training Organisations
R0150	Ed1.1	DGNSS Service Provision Upgrades and Future Uses
R0201	Ed3.1	Marine Signal Lights - Colours
R0202	Ed2.1	Marine Signal Lights - Calculation, Definition and Notation of Luminous Range
R0203	Ed2.0	Definition of Marine Signal Lights Terms of Measurement
R0204	Ed3.0	Marine Signal Lights - Determination and Calculation of Effective Intensity
R0205	Ed1.1	Marine Signal Lights - Part 5 - Estimation of the Performance of Optical Apparatus
R1001	Ed2.0	The IALA Maritime Buoyage System
R1002	Ed1.1	Risk Management for Marine Aids to Navigation
R1004	Ed2.1	Sustainability in the Provision of Marine Aids to Navigation
R1005	Ed1.1	Conserving the Built Heritage of Lighthouses and other Aids to Navigation
R1007	Ed2.0	The VHF Data Exchange System (VDES) for Shore Infrastructure
R1009	Ed1.1	Disaster Recovery
R1010	Ed1.1	The Involvement of Maritime Authorities in Marine Spatial Planning
R1011	Ed1.1	The Performance and Monitoring of eLoran Services in the Frequency Band 90-110 kHz
R1012	Ed1.2	VTS Communications
R1013	Ed1.1	Auditing and Assessing Vessel Traffic Services (VTS)
R1015	Ed1.1	Marking of Hazardous Wrecks
R1016	Ed2.0	Mobile Aids to Navigation (MAtoN)
R1017	Ed1.1	Resilient Position Navigation and Timing (PNT)
R1018	Ed1.1	Responsible Design, Operation and Maintenance in the Provision of Marine aids to Navigation
R1019	Ed2.0	Provision of Maritime Services in the Context of e-Navigation in the Domain of IALA
R1020	Ed1.0	Terrestrial Radionavigation Systems
R1021	Ed1.1	Marine Aids to Navigation Awareness for Mariners

R1022	Ed1.0	Provision of GNSS Augmentation Service for maritime navigation applications
R1023	Ed1.0	Maritime Resource Names
R1024	Ed1.0	Cyber security for the IALA domain
R1025	Ed1.0	Harmonized waterways datasets

Guidelines

Ref.	Edition	Title
G1004	Ed3.1	Level of Service
G1005	Ed2.1	Contracting out Aids to Navigation Services
G1006	Ed4.1	Plastic Buoys
G1008	Ed2.1	Remote Control and Monitoring of Marine Aids to Navigation
G1010	Ed2.1	Racon Range Performance
G1012	Ed3.1	The Protection of Lighthouses and other Aids to Navigation Against Damage from Lightning
G1014	Ed4.0	Accreditation of VTS Training Organizations and Approval to Deliver IALA VTS Model Courses
G1015	Ed2.2	Painting Aids to Navigation Buoys
G1016	Ed1.2	Bilateral Agreements and Inter-Agency Memorandums of Understanding on the Provision of DGNSS Services in the Frequency Band 283.5 - 325 kHz
G1017	Ed2.0	Assessment for Recognition of Prior Learning in VTS Training
G1018	Ed4.0	Risk Management
G1020	Ed1.2	Training Related to Aids to Navigation
G1023	Ed1.1	Design of Leading Lines (note - for calculation spreadsheet (In Microsoft Excel format) see Recommendation R-0112-1
G1027	Ed1.2	Simulation in VTS Training
G1033	Ed1.1	The Provision of Aids to Navigation for Different Classes of Vessels, Including High Speed Craft
G1035	Ed2.1	Availability and Reliability of Aids to Navigation - Theory and Examples
G1036	Ed3.1	Environmental Management in Aids to Navigation
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G1039-2	Ed2.1	Handbook for Meteorological Data for IALA Solar Power System Calculation Tool
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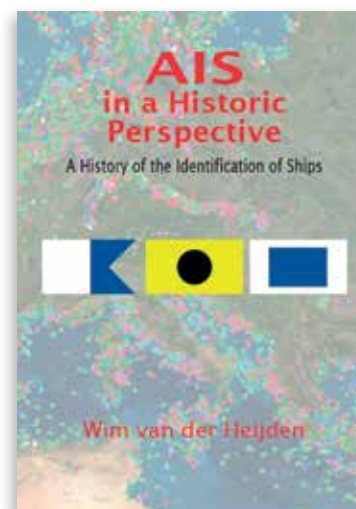
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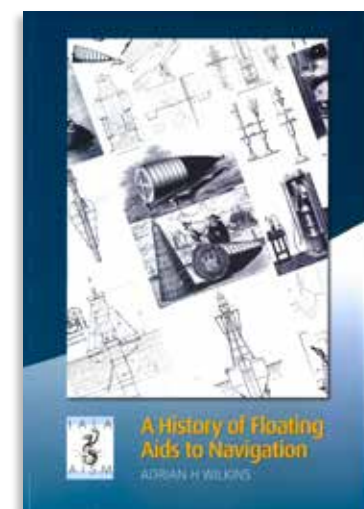
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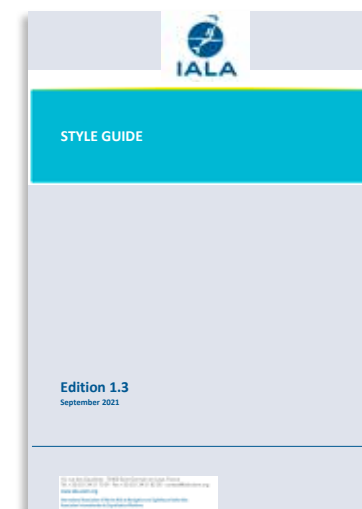
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AIS in a historic perspective
by Wim Van Der Heijden



A History of Floating Aids to Navigation
by Adrian H Wilkins



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