IALA

TECHNICAL DOCUMENTS CATALOGUE

ED 7.0 • MARCH 2024

Successful voyages,
Sustainable planet.

Lanterna di Genova, Italy

SECRETARY-GENERAL'S MESSAGE

IALA is a not-for-profit, international technical association. Established in 1957, it aims to harmonise and improve Marine Aids to Navigation (AtoN) by international cooperation.

IALA also offers marine AtoN authorities, manufacturers, service providers and scientific and training organisations the opportunity to discuss issues of common interest and concern.

IALA offers its members a forum to work together to develop guidance, so as to ensure the movement of vessels are safe and expeditious, while protecting the environment.

This booklet aims to provide a concise overview of the entire suite of IALA's publications (standards, recommendations guidelines, manuals and training courses).

I trust you will find this booklet useful in your work, study or research.

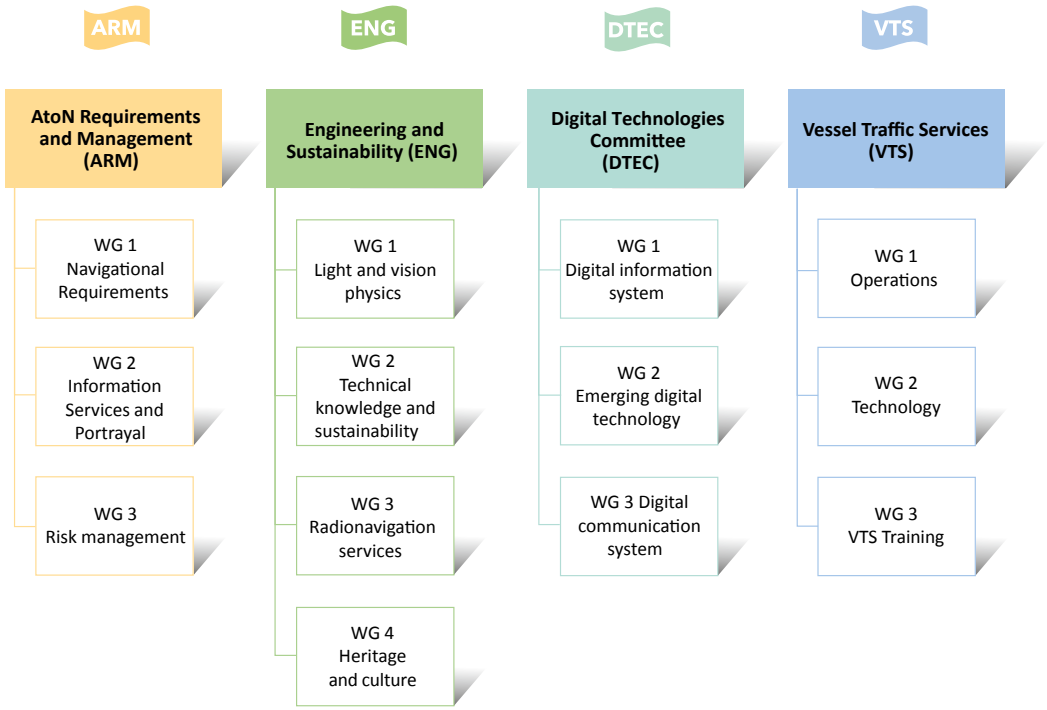
Francis Zachariae
Secretary-General

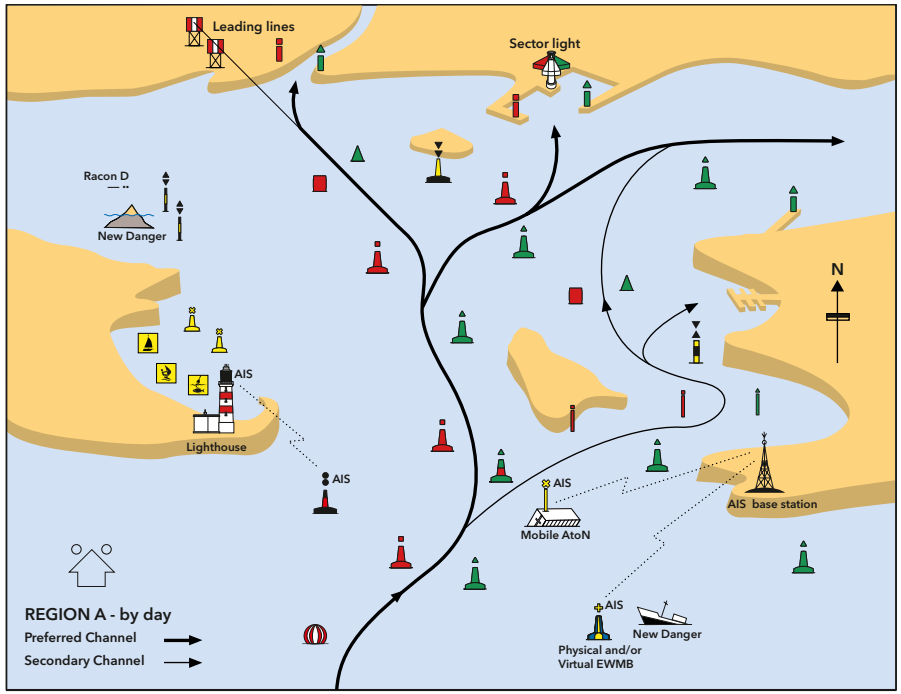
IALA TECHNICAL GUIDANCE

IALA's technical committees are the "engine room" of the association. 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; and Complementary Lighthouse Use 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-aism.org

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
R1021 ARM	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.

No	Date	Title	Ed	Summary
G1173 ARM	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
G1054 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
R1001 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
G1078 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
R0111 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
R0113 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
G1163 ARM	Dec 2021	Marking of Breakwaters and Barriers	1.1	Guidance on the marking of exposed and submerged breakwaters.
G1172 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 Man-Made Offshore Structures

No	N/I	Date	Title	Ed	Summary
R0139 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
G1162 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).

1.2.5. Marine Spatial Planning

No	N/I	Date	Title	Ed	Summary
R1010 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
G1121 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.
G1033 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.
G1079 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.

1.2.6. Cost Comparison

No	Date	Title	Ed	Summary
G1047 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
R0143 ARM	Inf	June 2021	Provision of Virtual AtoN	2.0	Recommends authorities consider deploying virtual as required.

No	Date	Title	Ed	Summary
G1081 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
R1016 ARM	Nor	Dec 2020	Mobile Marine AtoN (MAtoN)	2.0	Recommends the circumstances when authorities should use MAtoN.

No	Date	Title	Ed	Summary
G1154 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
R1024 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.

1.2.10. State of the Art Technologies

No	Date	Title	Ed	Summary
G1178 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.
G1179 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
G1153 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
R0130 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
G1004 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.
G1035 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.
G1037 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

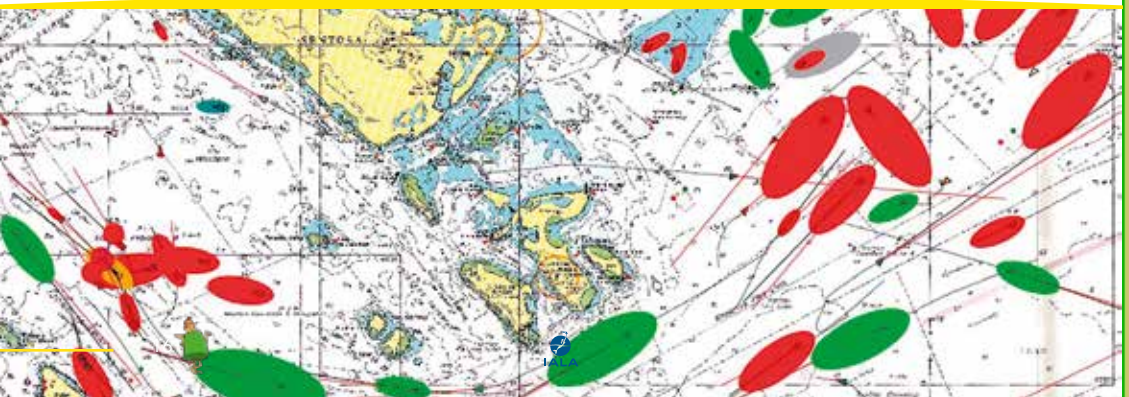
No	N/I	Date	Title	Ed	Summary
R0104 ARM	Nor	June 2012	'Off Station' Signals for Major Floating Aids	2.1	Recommends actions by authorities when major floating aids are off station.

1.4 Risk Management

1.4.1. Risk Management Tools

No	N/I	Date	Title	Ed	Summary
R1002 ARM	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
G1018 ARM	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.
G1123 ARM	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.
G1124 ARM	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.
G1138 ARM	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.
G1104 ARM	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

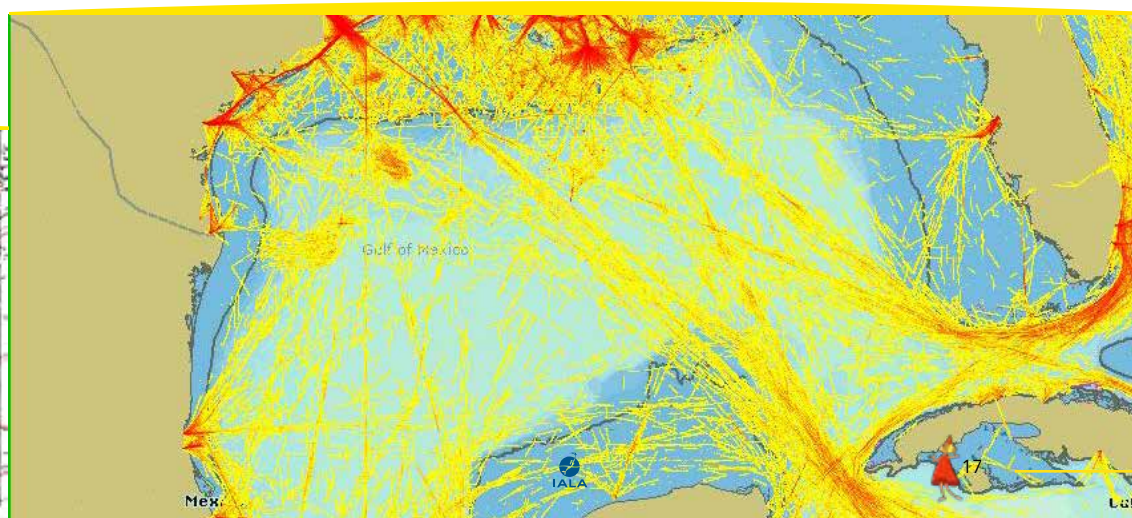
No	N/I	Date	Title	Ed	Summary
R0142 ARM	Inf	Dec 2009	Maritime Data Sharing 'IALA-NET'	1.1	Recommends authorities share their maritime data by participating in IALA-NET.

No	Date	Title	Ed	Summary
G1086 ARM	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
R0138 ARM	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
G1057 ARM	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.
G1058 ARM	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
R1009 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
G1120 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
R1015 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
G1046 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
R0132 ARM	Nor	Dec 2013	Quality Management for AtoN Authorities	2.2	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
G1052 ARM	Dec 2013	Quality Management in AtoN Service Delivery	3.1	Guidance to develop a quality management system, including implementation and maintenance.
G1133 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).
G1168 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.
G1005 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
R0118 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

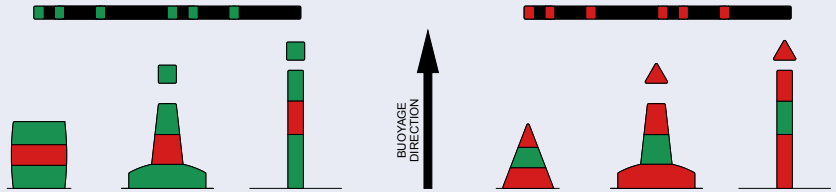
No	N/I	Date	Title	Ed	Summary
R0106 ENG	Nor	June 2017	Retroreflecting Material on Aids to Navigation Marks within the IALA MBS	2.1	Recommends the use of the standard or comprehensive code for retroreflective material on AtoN.

No	Date	Title	Ed	Summary
G1145 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
R0108 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.

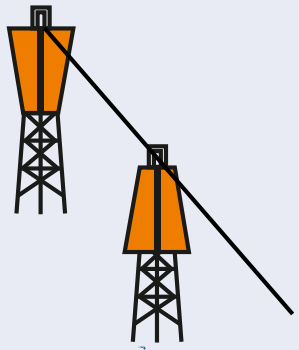
No	Date	Title	Ed	Summary
G1134 ENG	June 2021	Surface Colours Used as Visual Signals on Marine AtoN	2.1	Guidance on the technical aspects of selecting surface colours. It includes specification of colours, measurement, weathering and colour collections



2.1.3. Rhythmic Characters

No	N/I	Date	Title	Ed	Summary
R0110 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
G1116 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.
G1038 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.
G1043 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.
G1048 ENG	Dec 2005	LED Technologies and Their Use in Lignal 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
G1061 ENG	Dec 2008	Light Application-Illumination of Structures	1.1	Guidance on the illumination of light structures for navigational aspects.
G1094 ENG	June 2016	Daymarks for AtoN	2.1	Guidance on the main factors that need to be considered when establishing a daymark.



2.1.4. Leading Lights

No	N/I	Date	Title	Ed	Summary
R0112 ENG	Nor	Dec 2005	Leading Lights	1.2	Recommends technical parameters for leading lights.

No	Date	Title	Ed	Summary
G1023 ENG	Dec 2005	Design of Leading Lines	1.1	Guidance on the basics of leading line design, including design calculations (In Microsoft Excel).
G1041 ENG	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
G1122 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
R0201 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
R0202 ENG	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
G1148 ENG	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

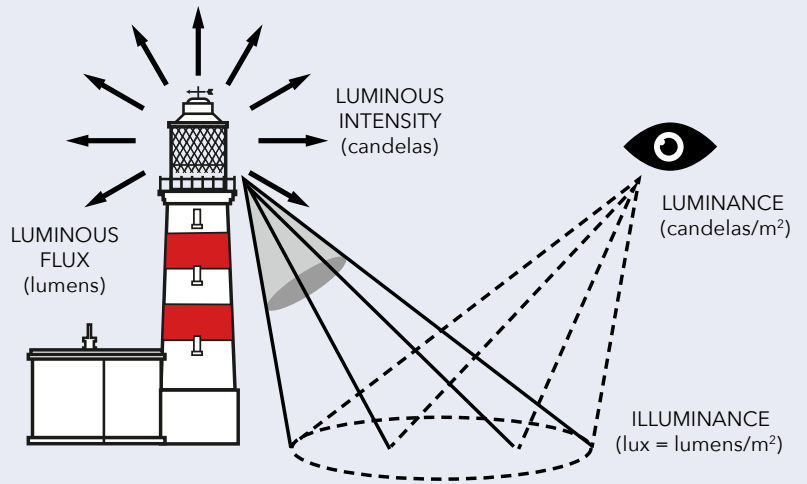
No	N/I	Date	Title	Ed	Summary
R0203 ENG	Inf	Dec 2022	Definition of Marine Signal Lights Terms and Measurement	2.0	Recommends authorities providing AtoN conduct photometric and colorimetric measurements of signal lights in accordance with this recommendation.

No	Date	Title	Ed	Summary
G1065 ENG	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
R0204 ENG	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
G1135 ENG	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
R0205 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
R0109 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
R0126 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.
G1084 ARM	June 2011	Authorization of AIS AtoN	1.1	Provides information on a suggested procedure for the authorization of AIS AtoN.
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.

2.2.2. Responsible Design

No	N/I	Date	Title	Ed	Summary
R1018 ENG	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 ENG	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 ENG	Dec 2009	Maintenance of AtoN	1.1	Guidance to assist authorities develop an overall AtoN maintenance strategy. Several annexes provide detailed information on all aspects of maintenance.
G1008 ENG	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 ENG	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 ARM	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 ENG	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 ENG	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.
G1108 ENG	Dec 2013	Challenges of Providing AtoN Services in Polar Regions	1.1	Guidance on the installation, operation and maintenance of AtoNs In polar regions.
G1136 ENG	Dec 2017	Providing AtoN Services in Extremely Hot and Humid Climates	1.1	Guidance on requirements for AtoN in extremely hot and humid regions. It covers characteristics of extremely hot and humid environments, AtoN maintenance and design and engineering considerations.
G1109 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.
G1140 ENG	Dec 2017	Commissioning of AtoN Equipment and Systems	1.1	Guidance on commissioning, including identification of critical factors and responsibilities of authorities.
G1151 ENG	Dec 2019	Maintenance of AtoN Structure	1.1	Guidance on the types of structures, component materials, maintenance, refurbishment and repair techniques.
G1174 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.

2.3 Floating Aids to Navigation

2.3.1. Moorings

No	N/I	Date	Title	Ed	Summary
R0107 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
G1066 ENG	June 2010	Design of Floating AtoN Moorings	1.2	Guidance on AtoN mooring materials, including design and mooring components.

2.3.2. Plastic Buoy

No	Date	Title	Ed	Summary
G1006 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.

2.3.3. Buoy Painting

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

2.3.4. Buoy Design

No	Date	Title	Ed	Summary
G1099 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
R1004 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
G1036 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.
G1137 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
G1175 ENG	Dec 2022	AtoN Equipment and Structures Exposed to Extreme Environmental Conditions.	1.0	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 System

No	Date	Title	Ed	Summary
G1170 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.
G1039 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
G1064 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
G1067 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
R1005 ENG	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
G1049 ENG	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.
G1063 ENG	Dec 2008	Agreement for Complementary Use of Lighthouse Property	1.1	Guidance on developing agreements to permit complementary use of lighthouse properties.
G1080 ENG	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.
G1093 ENG	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.
G1074 ENG	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.
G1075 ENG	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
R1017 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
G1180 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.
G1181 ENG	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.
G1127 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.

3.1.2. GNSS

No	N/I	Date	Title	Ed	Summary
R0129 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.
R1022 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
R1020 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
R1011 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
G1125 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
G1158 ENG	Dec 2020	VDES R-Mode	1.1	Guidance for authorities to establish VDES R-Mode; and for developers to design a VDES R-Mode hardware.

3.3 Augmentation Services

3.3.1. Maritime Radionavigation Service

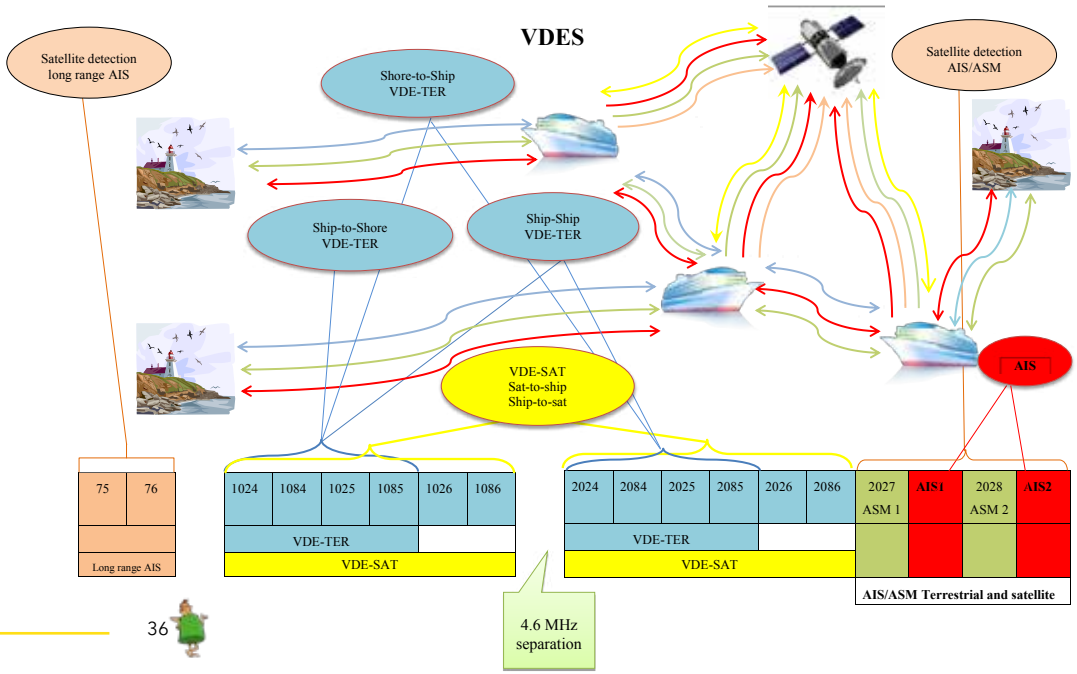
No	N/I	Date	Title	Ed	Summary
R0115 ENG	Nor	Dec 2005	Provision of Maritime Radionavigation Services in the Frequency Band 283.5-315 kHz in Region 1 and 283-325 kHz in Regions 2 and 3	1.2	Recommends authorities consider the provision, or enhancement, of DGNSS services in the frequency band 283.5-315 kHz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

No	Date	Title	Ed	Summary
G1016 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 ENG	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 ENG	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 ENG	Dec 2016	Marine Beacon Coverage Prediction	1.1	Guidance on calculating the expected signal strength of a single radiobeacon under different conditions.
G1126 ENG	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
R0135 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
G1060 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
R0150 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
G1053 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
G1129 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.
G1152 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

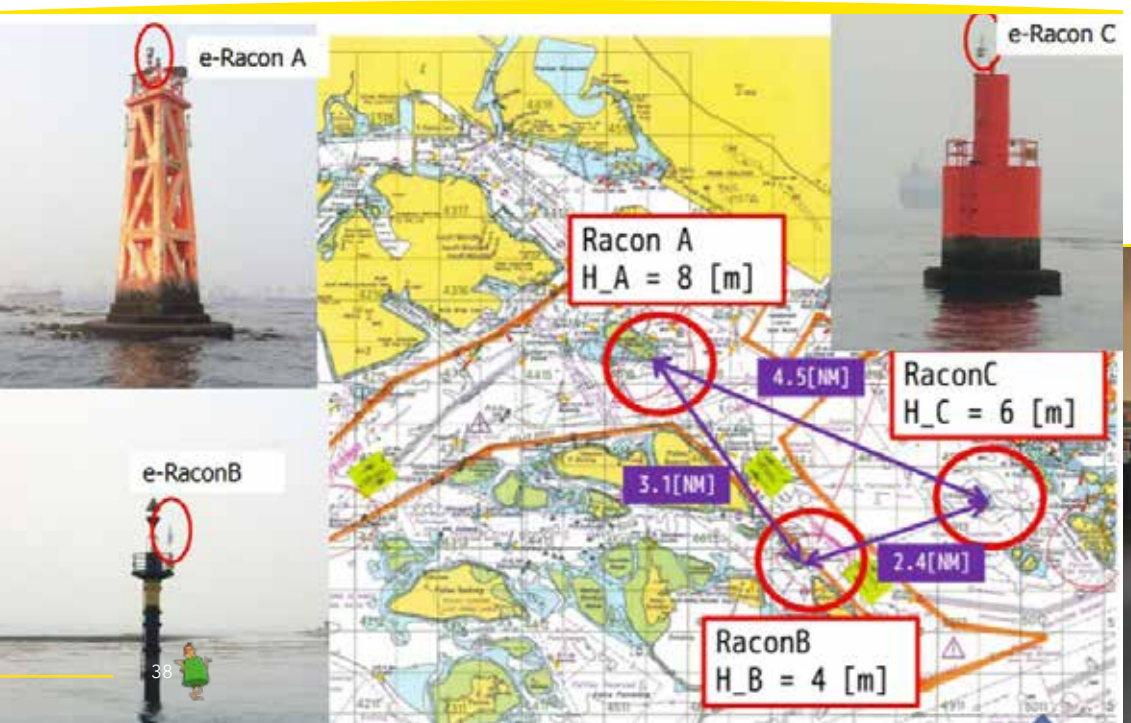
3.4.1. RACON

No	N/I	Date	Title	Ed	Summary
R0101 ENG	Nor	Dec 2004	Marine Radar Beacons (RACONS)	2.1	Recommends racons provided by authorities conform to the technical characteristics provided.
R0146 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
G1010 ENG	June 2005	RACON Range Performance	2.1	Guidance to estimate racon ranges, including examples.

3.4.2. ERPS

G1147 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.



S1040 VESSEL TRAFFIC SERVICES

4.1 VTS Implementation

4.1.1. VTS Planning

No	N/I	Date	Title	Ed	Summary
R0119 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.

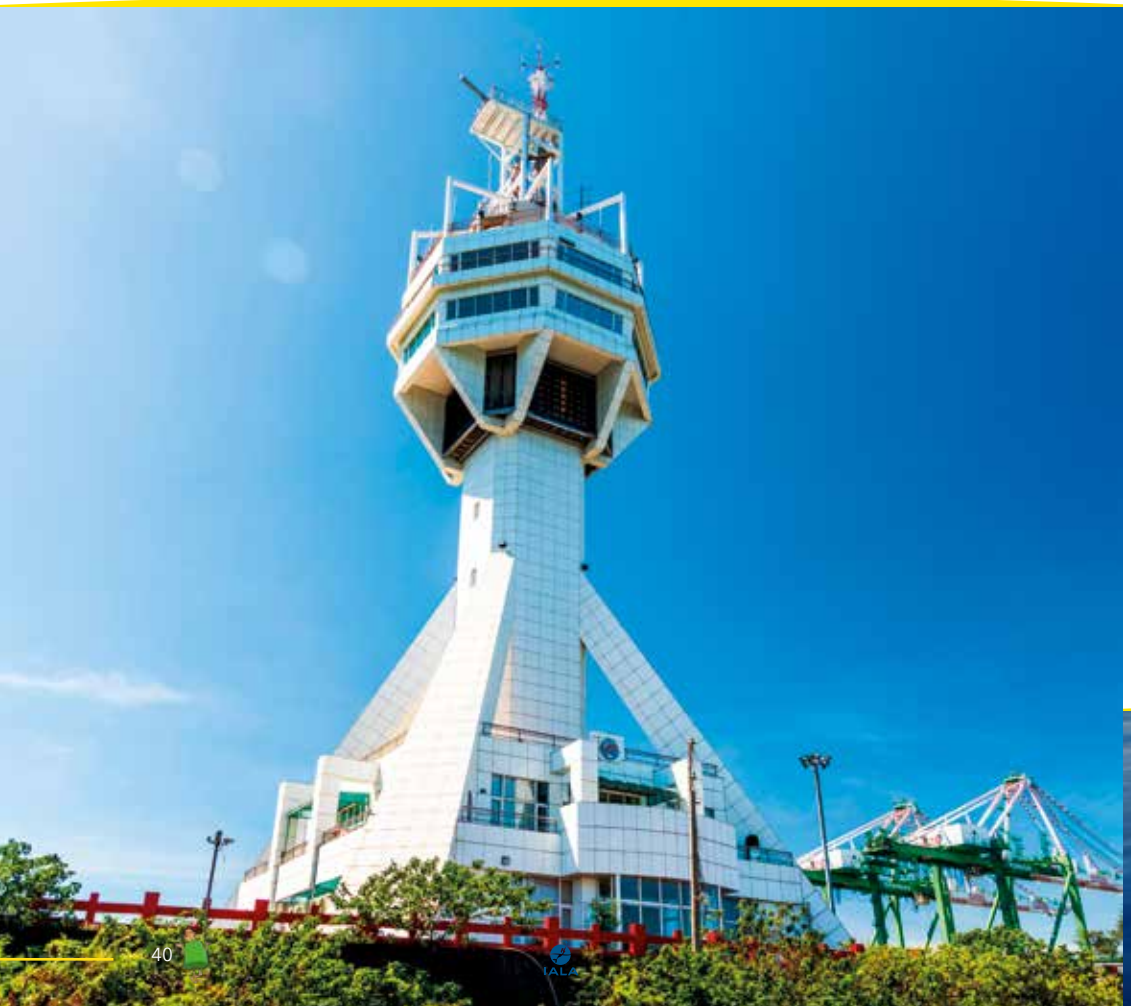
No	Date	Title	Ed	Summary
G1083 VTS	Jan 2022	Standard Nomenclature to Identify and Refer to VTS	1.1	Guidance to promote consistent nomenclature amongst VTS around the world.
G1150 VTS	June 2022	Establishing, Planning and Implementing a VTS	3.1	Guidance that provides a framework to assist authorities implement practices specified in IALA Recommendation R0119 on the establishment of VTS.
G1160 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.
G1171 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

4.1.2. VTS Inland Waters

No	Date	Title	Ed	Summary
G1166 VTS	Jan 2022	Vessel Traffic Services in Inland Waters	1.1	Guidance to assists 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
G1167 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
R0127 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
G1089 VTS	Jan 2022	Provision of VTS Services	2.0	Guidance on the provision of a VTS to participating ships in a harmonised manner.
G1110 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.
G1131 VTS	Jan 2022	Setting and Measuring VTS objectives	1.1	Guidance for authorities to set operational objectives for a VTS and achieve them.
G1141 VTS	Jan 2022	Operational Procedures for Delivering VTS	2.1	Guidance on a framework for authorities to implement processes and procedures associated with the provision of VTS.
G1144 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
G1045 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
G1118 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
G1176 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
R1012 VTS	Nor	Jan 2022	VTS Communica-tions	1.2	Recommends authorities contribute to precise and unambiguous communications with traffic by implementing harmonized procedures and technology.

No	Date	Title	Ed	Summary
G1132 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
R1013 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
G1101 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.
G1115 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
R0125 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
G1177 VTS	Dec 2022	Portrayal of VTS Information	1.0	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
R0128 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
G1111 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.
G1111-1 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.
G1111-2 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.
G1111-3 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.
G1111-4 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).
G1111-5 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.
G1111-6 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
G111-7 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.
G111-8 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.
G111-9 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
G1130 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
G1070 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
G1102 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
G1142 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
G1149 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
R0103 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
G1017 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.
G1027 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.
G1103 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.
G1156 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.

5.1.2. AtoN Training and Certification

No	N/I	Date	Title	Ed	Summary
R0141 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
G1020 ARM	Dec 2005	Training Related to AtoN	1.2	Guidance on the delivery of life cycle management requirements for AtoN, including training.
G1169 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
R0149 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
G1014 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.
G1100 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
R0123 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
G1050 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
R0124 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.
R0124-0	Nor	Dec 2012	AIS Service	1.1	Contains references, glossary of terms and abbreviations
R0124-1	Nor	Dec 2011	AIS Service	1.1	Basic AIS Services, AIS Data Model and AIS Service specific Maritime Data Exchange Format (MDEF) sentences
R0124-3 (	Nor	Dec 2012	AIS Service	1.1	Distribution model of the AIS Service (including relevant coverage planning aspects)
R0124-4	Nor	Dec 2011	AIS Service	1.1	Interaction and Data Flow Model of the AIS service
R0124-5	Nor	Dec 2011	AIS Service	1.0	Interfacing model of the AIS Service
R0124-9-10-11	Nor	Dec 2012	AIS Service	2.2	Functional Description of the AIS Service components
R0124-12	Nor	Dec 2012	AIS Service	1.1	Co-location issues at AIS Physical Shore Stations (AIS-PSS) and on-site infrastructure considerations
R0124-14	Nor	Dec 2011	AIS Service	2.1	FATDMA Planning and Operation of an AIS Service
R0124-16	Nor	Dec 2011	AIS Service	2.1	DGNSS Broadcasts from an AIS Service
R0124-17	Nor	Dec 2011	AIS Service	1.1	Channel Management by an AIS Service
R0124-18	Nor	Dec 2011	AIS Service	1.1	VDL load Management
R0124-19	Nor	Dec 2011	AIS Service	1.1	Satellite AIS considerations

6.1.3. VDES

No	N/I	Date	Title	Ed	Summary
R1007 DTEC	Nor	June 2017	VHF Data Exchange System (VDES) for Shore Infrastructure	1.1	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
G1117 DTEC	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
R0140 DTEC	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
G1113 DTEC	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.
G1114 DTEC	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
R0148 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
G1105 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
R0144 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
G1095 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
R0147 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
G1085 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.
G1087 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.
G1088 ARM	Dec 2012	Introduction to Preparing S-100 Product Specification	1.1	Guidance on the process of developing S-100 based Product Specifications.
G1106 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

7.1.3. Maritime Service

No	N/I	Date	Title	Ed	Summary
R1019 ARM	Inf	Dec 2019	Provision of Maritime Services in the context of e-Navigation in the domain of IALA	1.1	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
G1155 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.
G1161 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.
G1096 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.
G1107 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.

7.1.4. IVEF

No	N/I	Date	Title	Ed	Summary
R0145 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
R1023 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
G1143 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.
G1164 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
G1157 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
G1128 DTEC	Dec 2021	Specification of e-Navigation Technical Services	1.4	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.

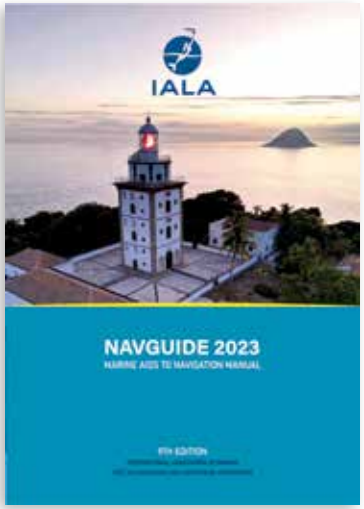
7.2.3. Ship Reporting

No	Date	Title	Ed	Summary
G1159 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.

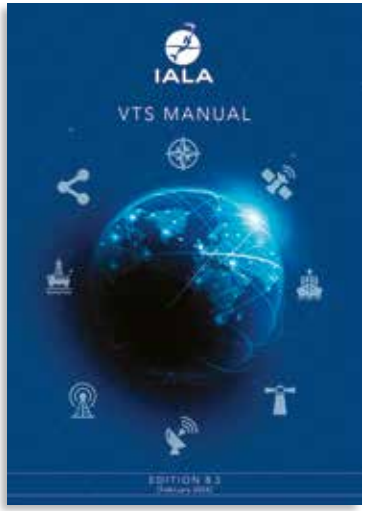
7.3 Terminology, Symbology and Portrayal

No documents yet

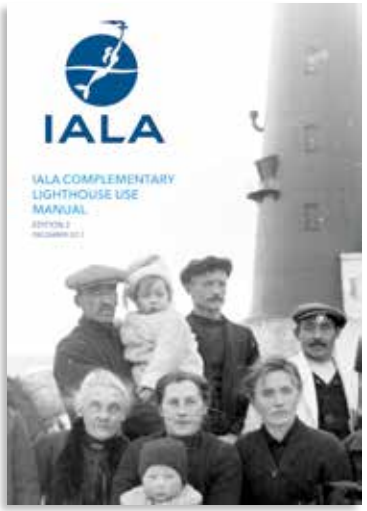
IALA MODEL COURSES



IALA NAVGUIDE Ed.9.0 2023



VTS Manual Ed.8.3 2024



IALA complementary lighthouse use manual, Ed. 2.0 2017

Aids to Navigation Management Training

Ref.	Edition	Title
C1001	Ed3.1 Dec 2019	L 1.1 - Marine Aids to Navigation - Manager Training *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.*
C1002	Ed1.0 Dec 2018	L 1.2 - Master of Marine Aids to Navigation Management *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.*
C1003	Ed3.0 June 2019	L 1.3 - Aids to Navigation Manager Training Level 1- Use of the IALA Risk Management Tools *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.*
C1004	Ed2.0 Dec 2018	L 1.4 - Aids to Navigation Management Training Level 1 – Global Navigation Satellite Systems and e-Navigation *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.*
C1005	Ed2.0 Dec 2018	L1.5 - Marine Aids to Navigation Management Training Level 1 – Module 5 - Historic Lighthouse Projects *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.*

Aids to Navigation Technician Training

Ref.	Edition	Title
C2000	Ed3.0 Jun 2016	Level 2 – Technician Training Model Course Overview
C2001-1	Ed1.0 Oct 2012	Level 2 – Technician Training Introduction to Aids to Navigation
C2001-2	Ed2.0 Jun 2016	Introduction to Aids to Navigation-Buoyage
C2001-3	Ed2.0 Jun 2016	Buoy Handling and Safe Working Practices
C2001-4	Ed3.0 Dec 2018	Buoy Moorings
C2001-5	Ed2.0 Jun 2016	Buoy Cleaning
C2001-6	Ed2.0 Jun 2016	Introduction to Buoy Positions
C2001-7	Ed2.0 Jun 2016	Maintenance of Plastic Buoys
C2001-8	Ed3.0 Dec 2021	Maintenance of Steel Buoys
C2001-9	Ed3.0 Dec 2021	Power Sources on Buoys
C2001-10	Ed2.0 Jun 2017	An Introduction to Shore Marks
C2002-1	Ed3.0 Dec 2018	DC Power Systems
C2002-2	Ed3.0 Dec 2018	Primary and Secondary Battery Maintenance
C2002-3	Ed3.0 Dec 2018	Photovoltaic (Solar Panel) Systems and Maintenance
C2002-4	Ed2.0 Jun 2017	Wind Generators
C2002-5	Ed2.0 Jun 2017	Mains AC Utility Power Systems; Diesel and Petrol Generators
C2002-6	Ed2.0 Jun 2017	Lightning Protection
C2003-1	Ed2.0 Dec 2016	Lights and Marine Lanterns
C2003-2	Ed2.0 Dec 2016	Light Flashers Lamp Changers and IPS Lanterns
C2003-3	Ed2.0 Dec 2016	Rotating Beacons and Classic Lenses
C2003-4	Ed2.0 Jun 2016	Maintenance of Mercury Rotating Optics
C2003-5	Ed2.0 Dec 2016	Range, Sector and Precision Direction Lights
C2004-1	Ed2.0 Dec 2016	Sound Signals
C2005-1	Ed2.0 Jun 2017	Introduction to Coatings and Specifications; Surface Preparation
C2006-1	Ed2.0 Jun 2016	Aids to Navigation Service Craft and Buoy Tenders
C2007-1	Ed3.0 Dec 2021	Radar Beacons (Racons) Maintenance
C2008-1	Ed2.0 Dec 2017	AIS Aids to Navigation Operations
C2009-1	Ed2.0 Jun 2016	Introduction to Radionavigation and DGNSS
C2010-1	Ed2.0 Dec 2017	Introduction to Remote Monitoring of Aids to Navigation
C2011-1	Ed2.0 Dec 2017	Marine Aids to Navigation Structures: Materials, Corrosion and Protection
C2011-2	Ed2.0 Dec 2017	Preservation of Structures
C2011-3	Ed2.0 Dec 2017	Maintenance Planning & Records

VTS

Ref.	Edition	Title
C0103-1	Ed3.0 Dec 2022	Vessel Traffic Services Operators Training *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.*
C0103-2	Ed3.0 Dec 2023	Vessel Traffic Services Supervisor - Training *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.*
C0103-3	Ed3.0 Dec 2022	Vessel Traffic Services On-the-Job Training *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.*
C0103-4	Ed2.0 Dec 2009	Vessel Traffic Services - On-the-Job Training Instructor *The purpose of this model course is to assist VTS centres deliver an On-the-Job Training (OJT) programme, including enhancing existing training material.*
C0103-5	Ed1.0 Jun 2016	The Revalidation Process for VTS Qualification and Certification *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.*

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	Ed2.2	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	Ed1.1	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	Ed1.1	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

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
G1037	Ed2.1	Data Collection for Aids to Navigation Performance Calculation
G1038	Ed3.1	Methods and Ambient Light Levels for the Activation of AtoN Lights
G1039	Ed2.0	Designing Solar Power Systems for Marine AtoN
G1039-1	Ed2.0	Solar Power System Calculation Tool (Microsoft Excel spreedsheet)

G1039-2	Ed2.1	Handbook for Meteorological Data for IALA Solar Power System Calculation Tool
G1041	Ed3.1	Sector Lights
G1043	Ed1.3	Light Sources Used in Visual Aids to Navigation
G1045	Ed1.1	Staffing Levels at VTS Centres (includes calculation spreadsheet in Microsoft Excel format)
G1046	Ed2.1	Response Plan for the Marking of New Wrecks
G1047	Ed1.1	Cost Comparison Methodology of Buoy Technologies
G1048	Ed1.1	LED Technologies and Their Use in Signal Lights
G1049	Ed2.1	The Use of Modern Light Sources in Traditional Lighthouse Optics
G1050	Ed1.1	The Management and Monitoring of AIS Information
G1051	Ed1.1	Provision and Identification of Aids to Navigation in Built up Areas
G1052	Ed3.1	Quality Management in Marine Aids to Navigation Service Delivery
G1053	Ed1.1	Template for the Submission of a DGNSS Service for Recognition as a Component of the IMO WWRNS
G1054	Ed2.0	Preparing for a Voluntary IMO Audit on Aids to Navigation Service Delivery
G1057	Ed1.1	Use of Geographical Information Systems by Aids to Navigation Authorities
G1058	Ed3.0	Use of Simulation as a Tool for Waterway Design and Aids to Navigation Planning
G1060	Ed2.1	Recapitalization of DGNSS
G1061	Ed1.1	Light Applications – Illumination of Structures
G1062	Ed1.1	The Establishment of AIS as an Aid to Navigation
G1063	Ed1.1	Agreements for Complementary use of Lighthouses Property
G1064	Ed1.1	Integrated Power Systems Lanterns (Solar LED Lanterns)
G1065	Ed4.2	AtoN Signal Light Beam Vertical Divergence
G1066	Ed1.2	The Design of Floating Aid to Navigation Moorings
G1067-0	Ed3.1	Selection of Power Systems for AtoN and Associated Equipment
G1067-1	Ed2.1	Total Electrical Loads of AtoN
G1067-2	Ed2.1	Power Sources
G1067-3	Ed3.1	Electrical Energy Storage for AtoN
G1070	Ed1.1	VTS Role in Managing Restricted or Limited Access Areas
G1071	Ed1.0	Establishment of a Vessel Traffic Service Beyond Territorial Seas
G1073	Ed2.1	Conspicuity of AtoN Lights at Night

G1074	Ed1.1	Branding and Marketing of Historic Lighthouses
G1075	Ed1.1	A Business Plan for the Complementary Use of a Historic Lighthouse
G1077	Ed1.1	Maintenance of Aids to Navigation
G1078	Ed2.1	The Use of AtoN in the Design of Fairways and Channels
G1079	Ed1.1	Establishing and Conducting User Consultancy by Aids to Navigation Authorities
G1080	Ed1.1	The Selection and Display of Heritage Artefacts
G1081	Ed2.1	Provision of Virtual Marine Aids to Navigation
G1082	Ed2.1	An Overview of AIS
G1083	Ed1.1	Standard Nomenclature to Identify and Refer a VTS
G1084	Ed1.1	Authorisation of AIS AtoN
G1085	Ed1.1	Standard Format for Electronic Exchange of AtoN Product Information
G1086	Ed1.1	The Global Sharing of Maritime Data and Information
G1087	Ed3.1	Procedures for the Management of the IALA Domains Under the IHO GI Registry
G1088	Ed1.1	Introduction to Preparing S-100 Product Specifications
G1089	Ed2.0	Provision of a VTS
G1090	Ed1.1	The Use of Audible Signals
G1091	Ed2.1	Bird Deterrents and Bird Fouling Solutions
G1092	Ed2.1	Safety Management for AtoN Activities
G1093	Ed1.1	The Management of Surplus Lighthouse Property
G1094	Ed2.1	Daymarks for Aids to Navigation
G1095	Ed1.1	Harmonised implementation of Application-Specific Messages (ASMs)
G1096	Ed1.1	Anticipated User e-Navigation Requirements from Berth to Berth, for AtoN Authorities
G1098	Ed1.1	On the Application of AIS - AtoN on Buoys
G1099	Ed1.1	The Hydrostatic Design of Buoys
G1100	Ed2.0	The Accreditation and Approval Process for AtoN Personnel Training
G1101	Ed1.1	Auditing and Assessing VTS
G1102	Ed1.1	VTS Interaction with Allied or Other Services
G1103	Ed1.1	Train the Trainer
G1104	Ed1.1	The Application of Maritime Surface Picture for Analysis in Risk Assessment and the Provision of Aids to Navigation
G1105	Ed2.0	Shore-Side Portrayal Ensuring Harmonisation with e-Navigation Related Information
G1106	Ed2.1	Producing an IALA S-200 Series Product Specification

G1106-1	Ed1.1	IALA Product Specification Number Template
G1106-2	Ed1.1	Proposal for Additional S-100 Feature Concept Dictionery (FCD) Item - Name of Proposed FCD Item
G1106-3	Ed1.3	Product Specification under Development - Template
G1107	Ed3.0	Planning and Reporting of Testbeds in the Maritime Domain
G1108	Ed1.1	The Challenges of Providing AtoN Services in Polar Regions
G1109	Ed1.1	Theft and Vandalism Deterrents
G1110	Ed2.1	Use of Decision Support Tools for VTS Personnel
G1111	Ed2.0	Establishing Functional and Performance Requirements for VTS Systems And Equipment
G1111-1	Ed1.0	Producing Requirements for the Core VTS System
G1111-2	Ed1.0	Producing Requirements for Voice Communication
G1111-3	Ed1.0	Producing Requirements for Radar
G1111-4	Ed1.0	Producing Requirements for AIS
G1111-5	Ed1.0	Producing Requirements for Environment Monitoring Sensors
G1111-6	Ed1.0	Producing Requirements for Electro-Optical Systems
G1111-7	Ed1.0	Producing Requirements for Radio Detection Finders
G1111-8	Ed1.0	Producing Requirements for Long Range Sensors
G1111-9	Ed1.0	Framework for Acceptance of VTS Systems
G1112	Ed1.1	Performance and Monitoring of DGNSS Services in the Frequency Band 283,5 - 325 kHz
G1113	Ed1.1	Design and Implementation Principles for Harmonized System Architectures of Shore-Based Infrastructure
G1114	Ed1.1	A Technical Specification for the Common Shore-based System Architecture (CSSA)
G1115	Ed1.1	Preparing for an IMO Member State Audit Scheme (IMSAS) on Vessel Traffic Services
G1116	Ed1.1	Selection of Rhythmic Characters and Synchronisation of Lights for Aids to Navigation
G1117	Ed3.0	VHF Data Exchange System (VDES) Overview
G1118	Ed1.1	Marine Casualty / Incident Reporting and Recording, including Near-Miss Situations as it Relates to VTS
G1119	Ed1.1	Marine Beacon Coverage Prediction
G1120	Ed1.1	Disaster Recovery
G1121	Ed1.2	Navigational Safety within Marine Spatial Planning
G1122	Ed1.1	The Use of Pictograms on Aids to Navigation
G1123	Ed2.1	The Use of IALA Waterway Risk Assessment Programme (IWRAP)
G1124	Ed2.1	The Use of Ports and Waterways Safety Assessment (PAWSA MKII) Tool
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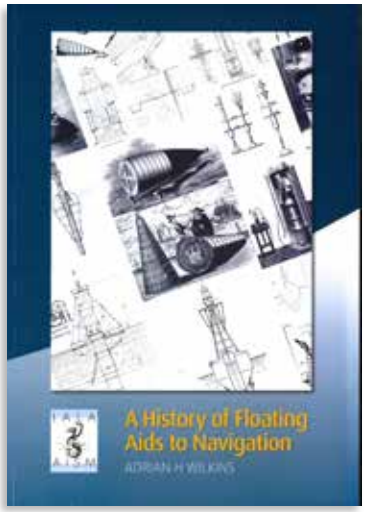

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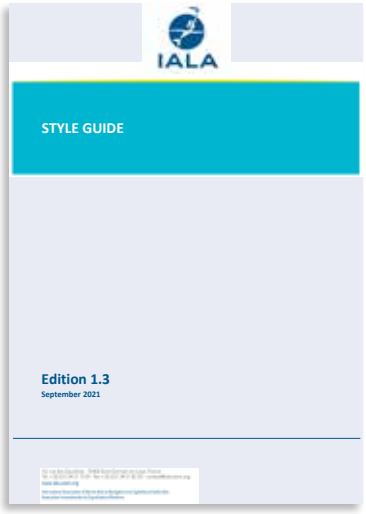

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