IALA

TECHNICAL DOCUMENTS
CATALOGUE 2021

Successful voyages,
Sustainable planet.

MESSAGE FROM SECRETARY-GENERAL

Established in 1957, IALA gathers together Marine Aids to Navigation authorities, manufacturers, consultants, and, scientific and training institutes from all parts of the world and offers them the opportunity to exchange and compare their experiences and achievements.

IALA encourages its members to work together in a common effort to harmonise Aids to Navigation worldwide and to ensure that the movements of vessels are safe, expeditious and cost effective while protecting the environment.

This booklet gives you an overall view of the IALA Standards, Recommendations and Guidelines with summary. I hope you enjoy the reading and find useful information for your work, study or research.

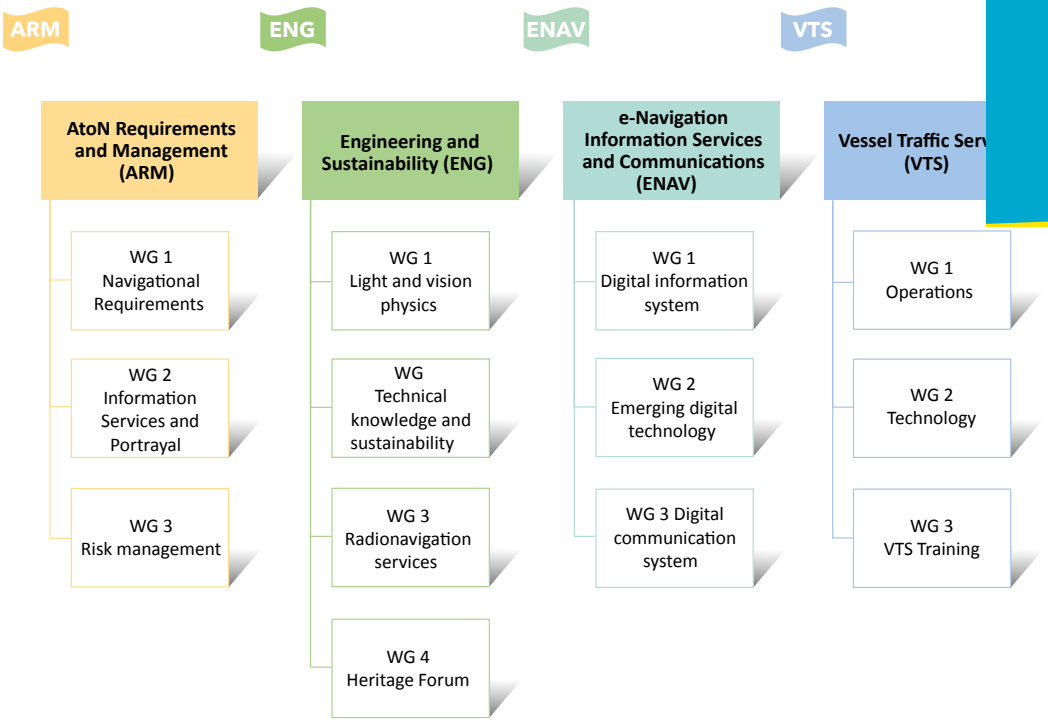
Francis Zachariae
Secretary-General

IALA TECHNICAL GUIDANCE

IALA develops wide-ranging technical guidance through the work of its Committees. These are the "engine room" of the association. IALA Committees bring together Marine Aids to Navigation authorities, subject matter experts, manufacturers and consultants from all parts of the world.

Participation in Committee work offers the opportunity to:

- Contribute expertise and compare experiences with other IALA members;
- Share points of view within the international maritime community;
- Participate in the development of new systems and technologies;
- Enable the worldwide maritime community to speak with one voice in international forums at a time when maritime requirements run the risk of being lost within a fast developing technological context; and
- Meet with suppliers or customers and contribute to the design of "best practice" products.



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 publications (Model courses)

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

IALA STANDARDS

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

STANDARD 1010
ATON PLANNING AND SERVICE REQUIREMENT
1.1 Marine Aids to Navigation planning
1.2 Obligations and regulatory compliance
1.3 Levels of service
1.4 Risk management
1.5 Quality management
1.6 Virtual marking

STANDARD 1020
ATON DESIGN AND DELIVERY
2.1 Visual signalling
2.2 Range and performance
2.3 Design, implementation, and maintenance
2.4 Floating aids to navigation
2.5 Environment and sustainability
2.6 Heritage and legacy
2.7 Power systems

STANDARD 1030
RADIONAVIGATION SERVICES
3.1 Satellite positioning and timing
3.2 Terrestrial positioning and timing
3.3 Racon and radar positioning
3.4 Augmentation services

STANDARD 1040
VESSEL TRAFFIC SERVICES
4.1 VTS implementation
4.2 VTS operations
4.3 VTS data and information management
4.4 VTS communications
4.5 VTS technologies
4.6 VTS auditing and assessing
4.7 VTS additional services

STANDARD 1050
TRAINING AND CERTIFICATION
5.1 Training and assessment
5.2 Human factors and ergonomics
5.3 Simulation in training
5.4 Capacity building
5.5 Competency, certification and revalidation

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

STANDARD 1010
ATON PLANNING AND SERVICE REQUIREMENT

1.1 Aids to Navigation planning

Maritime buoyage system

No	N/I	Date	Title	Ed	Summary
R1001 ARM	Nor	June 2017	IALA Maritime Buoyage System	1.1	IALA Maritime Buoyage System.

No	Date	Title	Ed	Summary
G1078 ARM	June 2011	Use of AtoN in the design of fairways	1.0	Guidance on the use of AtoN in the design of fairways including dredged channels and canals, and review of existing AtoN in the area.

Port traffic signals

No	N/I	Date	Title	Ed	Summary
R0111 (E-111) ENG	Nor	Dec 2019	Port traffic signals	1.3	Principle of the system and rules for port traffic signals.

Marking bridges and structures

No	N/I	Date	Title	Ed	Summary
R0113 (O-113) ARM	Nor	Dec 2011	Marking of fixed bridges and other structures over navigable waters	2.1	Applies to fixed bridges and other structures including floating bridges, overhead pipelines.

Marking man-made offshore structures

No	N/I	Date	Title	Ed	Summary
R0139 (O-139) ARM	Nor	Dec 2013	Marking of Man-made offshore structures	2.1	Information for national authorities, lighthouse authorities and others on marking of Man-made offshore structures.

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	Includes MSP involvement, risk management toolbox, and mitigating measures.

No	Date	Title	Ed	Summary
G1033 ARM	Dec 2003	Provision of AtoN for different classes of vessels including high speed craft	1.0	Provides information on consideration for high-speed craft and assessing requirements for the provision of AtoN for different classes of vessels.
G1079 ARM	Dec 2009	Establishing and conducting user consultancy by AtoN authorities	1.0	General guidance on consultation but does not preclude the development and implementation of strategies for specific programs.
G1121 ARM	June 2017	Navigational safety within marine spatial planning	1.0	Informs AtoN and other maritime authorities of the main elements of the Marine Spatial Planning (MSP) process. It also provides information to other MSP stakeholders and the MSP authority of the underlying navigation factors to be taken into account during the process.

Cost comparison

No	Date	Title	Ed	Summary
G1047 ARM	Dec 2005	Cost comparison methodology of buoy technologies	1.0	Provides information on various materials could be used for buoys, and considerations and financial analysis and the Net Present Value (NPV) method.

Audible signals

No	Date	Title	Ed	Summary
G1090 ARM	Dec 2012	Use of audible signals	1.0	Provides clarification for the use of audible signals to warn mariners of navigational hazards and for use as an augmentation to floating AtoN.

e-Navigation requirements

No	Date	Title	Ed	Summary
G1096 ARM	May 2013	Anticipated user e-Navigation requirements from berth to berth, for AtoN authorities	1.0	Provides guidance for AtoN authorities on user requirements and applications of e-Navigation from berth to berth.

Planning and reporting of e-Navigation

No	Date	Title	Ed	Summary
G1107 ENAV	June 2016	Planning and reporting of e-Navigation testbeds	2.0	Offers guidance on the planning and reporting or results from e-Navigation testbeds. This document covers the design of testbeds and reporting of the testbed results.

Emerging technologies template

No	Date	Title	Ed	Summary
G1153 ENAV	Dec 2019	Template for the review of emerging technologies for possible use by IALA members	1.0	Provides information to IALA membership on how to evaluate emerging digital technologies in consideration of user requirements and needs.

1.2 Obligations and regulatory compliance

AtoN awareness for mariners

No	N/I	Date	Title	Ed	Summary
R1021 ARM	Nor	Dec 2020	Marine Aids to Navigation awareness for mariners	1.0	Recommends the national members bring the content of the recommendation to the attention of the relevant maritime administration responsible for the implementation of the STCW, maritime training institute, organisations representing mariners.

Contracting out

No	Date	Title	Ed	Summary
G1005 ARM	Dec 2005	Contracting out AtoN service	2.0	Procedure for AtoN authorities when considering contracting out AtoN service.

IMSAS

No	Date	Title	Ed	Summary
G1054 ARM	Nov 2006	Preparing for a voluntary IMO audit on AtoN service delivery	1.0	Provides information on the pre-audit questionnaire and checklist for auditing preparation.

1.3 Levels of service

Categorisation and availability

No	N/I	Date	Title	Ed	Summary
R0130 (O-130) ARM	Nor	Dec 2017	Categorisation and availability objectives for short range AtoN	3.1	Recommends the categories and availability objectives.

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.

1.4 Risk management

GIS and simulation

No	N/I	Date	Title	Ed	Summary
R0138 (O-138) ARM	Inf	Dec 2007	Use of GIS and simulation by AtoN authorities	1.1	Covers rationale, the volume of traffic and degree of risk, geographic information systems and AtoN, and simulation.

No	Date	Title	Ed	Summary
G1057 ARM	Dec 2007	Use of geographic information systems by AtoN authorities	1.0	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 2011	Use of simulation as a tool for waterway design and AtoN planning	2.0	Covers the range of user requirements, simulation tools, and analysis, reporting and documentation of results.
G1097 ARM	May 2013	Technical features and technology relevant for simulation of AtoN	1.0	Represents the technological status of simulation of AtoN. This document covers user need and requirements, modelling and simulation of AtoN, visual simulation, display technology, radar and sound simulation.

Maritime data sharing

No	N/I	Date	Title	Ed	Summary
R0142 (E-142) ARM	Inf	Dec 2009	Maritime data sharing 'IALA-NET'	1.1	Provides guiding principle of the IALA NET.
G1086 ARM	June 2012	Global sharing of maritime data & information		1.0	Guidance on relevant aspects related to the exchange of global maritime data and information in the context of promoting the safety of navigation, security, protection of the maritime environment and efficiency of maritime traffic.

Risk management

No	N/I	Date	Title	Ed	Summary
R1002 ARM	Nor	June 2017	Risk management for marine AtoN	1.1	Recommends using the risk management and IALA risk management tools.

No	Date	Title	Ed	Summary
G1018 ARM	May 2013	Risk management	3.0	Outlines a general description of risk management methodology for AtoN including VTS through the analysis of all the hazards in a waterway.
G1123 ARM	June 2017	Use of IALA Waterway Risk Assessment Programme (IWRAP MK II)	1.0	IWRAP is a risk assessment tool to provide authorities with a standardized quantitative method to evaluate the probability of collisions and groundings in a given waterway.
G1124 ARM	June 2017	Use of Ports And Waterways Safety Assessment (PAWSA MK II) tool	1.0	Provides guidance on PAWSA's systematic approach to the identification of major waterway safety hazards.
G1138 ARM	Dec 2017	Use of the Simplified IALA Risk Assessment method (SIRA)	1.0	Provides guidance on SIRA's structured process which identifies hazards, and undesired incidents or scenarios in a given area.
G1104 ARM	Dec 2013	Application of maritime surface picture for analysis in risk assessment and the provision of AtoN	1.0	Provides guidance on the use of GIS to assess the requirement and impact of AtoN in the area of interest. It covers the incorporation of charting overlays with new dangers and amplification of existing dangers.

Disaster recovery

No	N/I	Date	Title	Ed	Summary
R1009 ARM	Inf	June 2017	Disaster recovery	1.1	Recommends competent authorities to develop a set of appropriate generic responses.

No	Date	Title	Ed	Summary
G1120 ARM	June 2017	Disaster recovery	1.0	Promotes awareness of the benefits of building a disaster recovery plan, and recommend a basic field of responsibility and actions.

Marking wrecks

No	N/I	Date	Title	Ed	Summary
R1015 ARM	Nor	Dec 2017	Marking of hazardous wrecks	1.1	General recommendation on marking of hazardous wrecks including monitoring and reporting.

No	Date	Title	Ed	Summary
G1046 ARM	June 2019	Response plan for the marking of new wrecks	2.0	The basis for developing an Emergency Wreck Marking Plan (EWMP) for marking a wreck including considerations and procedures.

Use of Mobile AtoN

No	N/I	Date	Title	Ed	Summary
R1016 ARM	Nor	Dec 2020	Mobile marine AtoN (MAtoN)	2.0	Recommends IALA members and authorities to use MAtoN in accordance with the appropriated risk assessment.

No	Date	Title	Ed	Summary
G1154 ARM	Dec 2020	Use of Mobile AtoN	1.0	Explains types of MatoN, deployment, monitoring, reporting, discontinuation and responsibilities.

1.5 Quality management

Quality management

No	N/I	Date	Title	Ed	Summary
R0132 (O-132) ARM	Nor	Dec 2013	Quality management for AtoN authorities	2.2	Recommends authorities responsible for AtoN implementing and maintaining a Quality Management System.

No	Date	Title	Ed	Summary
G1052 ARM	Dec 2013	Quality management in AtoN service delivery	3.0	Basic platform for the implementation of a QMS. It is designed to encourage and assist Competent Authorities to consistently achieve the required outcomes in the delivery of service.
G1133 ARM	June 2019	Requirement traceability	1.0	Provides guidance to IALA members to establish requirement traceability as part of their requirement management, and maximize the benefit of it.

Recoding AtoN position

No	N/I	Date	Title	Ed	Summary
R0118 (O-118) ARM	Nor	Dec 2005	Recording of AtoN positions	1.2	Recommendation on the recording of AtoN positions.

1.6 Virtual marking

Virtual AtoN

No	N/I	Date	Title	Ed	Summary
R0143 (O-143) ARM	Inf	May 2013	Provision of virtual AtoN	1.2	Definition, purpose, and application of virtual AtoN including its risks, limitation, and benefit.

No	Date	Title	Ed	Summary
G1081 ARM	May 2013	Provision of virtual AtoN	1.1	Guidance on the use of virtual AtoN risks and benefits, criteria for application, notification process, display, application and delivery methods, and etc.

STANDARD 1020
ATON DESIGN AND DELIVERY

2.1 Visual AtoN

Off station signal

No	N/I	Date	Title	Ed	Summary
R0104 (O-104) ARM	Nor	June 2012	'Off station' signals for major floating aids	2.1	Technical recommendation on the light and Morse code when major floating aids is off station.

Retroreflecting material

No	N/I	Date	Title	Ed	Summary
R0106 (E-106) ENG	Nor	June 2017	Retroreflecting Material on Aids to Navigation Marks within the IALA MBS	2.1	Recommends standard code and comprehensive code of retroreflecting material on AtoN.

No	Date	Title	Ed	Summary
G1145 ENG	June 2019	Application of retroreflecting material on AtoN	1.0	Gives more detailed information on what retroreflectivity is and how retroreflective material can be applied on AtoN.

Surface colours

No	N/I	Date	Title	Ed	Summary
R0108 (E-108) ENG	Nor	Dec 2017	Surface colours used as visual signals on AtoN	4.1	Recommends national members and other appropriate authorities to use the surface colours set out in the annexes.

No	Date	Title	Ed	Summary
G1134 ENG	Dec 2017	Surface colours used as visual signals on AtoN	1.0	Covers the specification and measurement of the colours, considerations of particular colours, and degradation of pigments and etc.

Rhythmic characters

No	N/I	Date	Title	Ed	Summary
R0110 (E-110) ENG	Nor	Dec 2016	Rhythmic characters of lights on AtoN	4.1	Rhythmic characters of lights on AtoN.

No	Date	Title	Ed	Summary
G1116 ENG	Dec 2016	Selection of rhythmic characters and synchronization of lights for AtoN	1.0	Provides guidance to the technical aspects of selecting the rhythmic characters. It includes temporal consideration, selection of colours, the use of the fixed and flashing character, user considerations, synchronization and sequencing.

Leading lights

No	N/I	Date	Title	Ed	Summary
R0112 (E-112) ENG	Nor	Dec 2005	Leading lights	1.2	Recommends the thresholds of illuminance at night and day, and the calculation program is included.

No	Date	Title	Ed	Summary
G1023 ENG	Dec 2005	Design of leading lines	1.1	Basics of leading line design including design program in excel.

Method and ambient light levels

No	Date	Title	Ed	Summary
G1038 ENG	Dec 2016	Method and ambient light levels for the activation of AtoN lights	3.0	Guidance on ambient light levels, local environmental factors, sensors, testing, and alternative switching methods and power considerations.

Light sources

No	Date	Title	Ed	Summary
G1043 ENG	Dec 2011	Light sources used in visual AtoN	1.2	Provides information on existing and developing light sources used in AtoN systems, and associated operational considerations such as AtoN light source lifetime, reliability, operating cost and power consumption.

No	Date	Title	Ed	Summary
G1048 ENG	Dec 2005	LED technologies and their use in signal lights	1.0	Understanding of the unique optical, thermal and electrical properties of LEDs and LED lights.

Light application

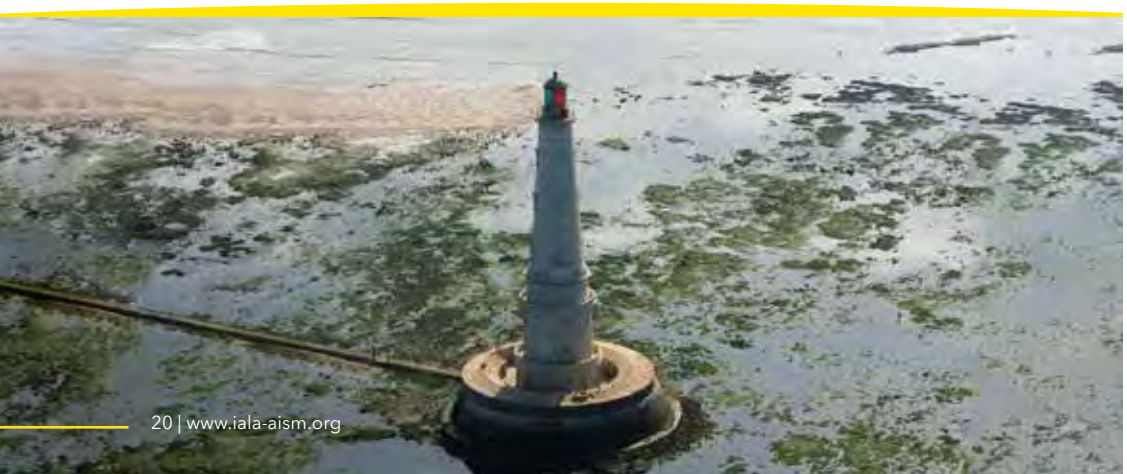
No	Date	Title	Ed	Summary
G1061 ENG	Dec 2008	Light application- illumination of structures	1.0	Focuses on the illumination of light for the navigational aspect. Technical consideration, application and design considerations are included.

Daymark

No	Date	Title	Ed	Summary
G1094 ENG	June 2016	Daymarks for AtoN	2.0	A general informative overview of the main factors that need to be considered when providing and designing a daymark. It points out the aspects of visual perception and how to optimize the identification of a daymark.

Pictogram

No	Date	Title	Ed	Summary
G1122 ARM	June 2017	Use of pictograms on AtoN	1.0	Provides guidance to competent authorities on the application of pictograms on special marks.



2.2 Range and performance

Range of sound signal

No	N/I	Date	Title	Ed	Summary
R0109 (E-109) ENG	Inf	June 1998	Calculation of the range of a sound signal	1.1	Recommends using the method described in the annex of the document.

Marine signal light

No	N/I	Date	Title	Ed	Summary
R0200 (E-200-0) ENG	Inf	Dec 2008	Marine signal lights - overview	1.1	Overview of E-200 series.

Light colours

No	N/I	Date	Title	Ed	Summary
R0201 (E-200-1) ENG	Nor	Dec 2017	Marine signal lights – colours	3.1	Recommendation on the colour regions and chromaticity chart.

Light calculation, definition and notation

No	N/I	Date	Title	Ed	Summary
R0202 (E-200-2) ENG	Nor	Dec 2017	Marine signal lights – calculation, definition and notation of luminous range	2.1	Recommendation on the luminous range nomographs and tables.

No	Date	Title	Ed	Summary
G1148 ENG	Dec 2019	Determination of required luminous intensity for marine signal lights	1.0	Provides information to determine the light intensity to provide a good service to the user in a given area, whilst maintaining a balance between performance and cost.

Light measurement

No	N/I	Date	Title	Ed	Summary
R0203 (E-200-3) ENG	Nor	Dec 2008	Marine signal lights – measurement	1.1	Recommendation on the measurement.

No	Date	Title	Ed	Summary
G1065 ENG	Dec 2018	AtoN signal light beam vertical divergence	4.0	Provides users practical guide on the lantern divergence for any given AtoN.

Effective intensity

No	N/I	Date	Title	Ed	Summary
R0204 (E-200-4) ENG	Nor	Dec 2017	Marine signal lights – determination and calculation of effective intensity	2.1	Recommendation on the determination and calculation of effective intensity with modified Allard method.

No	Date	Title	Ed	Summary
G1135 ENG	Dec 2020	Determination and calculation of effective intensity	2.0	Describes how to calculate the effective intensity of a given flash of light when viewed at the IALA defined illumination threshold of visual signalling.

Estimation of optic performance

No	N/I	Date	Title	Ed	Summary
R0205 (E-200-5) ENG	Inf	Dec 2008	Marine signal lights – estimation of the performance of optical apparatus	1.1	Methods of approximate calculation of the peak luminous intensity of the beam, and estimation of beam intensity.

Data collection

No	Date	Title	Ed	Summary
G1037 ENG	Dec 2009	Data collection for AtoN performance calculation	2.0	Provides details of methods that can be used to collect information on the availability and reliability of AtoN equipment.

Sector light

No	Date	Title	Ed	Summary
G1041 ENG	June 2016	Sector lights	3.0	General guidance on planning sector lights including technical considerations.

Conspicuity

No	Date	Title	Ed	Summary
G1073 ENG	Dec 2017	Conspicuity of AtoN lights at night	2.0	Overview of the factors affecting the usefulness of a marine AtoN light and ways to improve its effectiveness by increasing conspicuity.

Availability and reliability

No	Date	Title	Ed	Summary
G1035 ENG	Dec 2004	Availability and reliability of AtoN – theory and examples	2.0	Provides a method of calculating availability and reliability calculation with a view to enabling members to provide a cost-effective AtoN service.

2.3 Design, implementation, and maintenance

Use of AIS

No	N/I	Date	Title	Ed	Summary
R0126 (A-126) ARM	Inf	June 2011	Use of the AIS in Marine AtoN services	1.6	Information on the technical standard for AIS AtoN stations, and supplementary messages, and implementation.

No	Date	Title	Ed	Summary
G1082 ENAV	June 2016	Overview of AIS	1.0	Introduction to AIS at an overview level for shore authorities and references relevant documentation where further information can be found.
G1062 ENAV	Dec 2008	Establishment of AIS as an AtoN	1.0	Identifies general criteria to assist AtoN authorities in determining whether AIS AtoN functionality should be provided.
G1084 ARM	June 2011	Authorization of AIS AtoN	1.0	Provides information on the suggested procedure for the authorization of AIS AtoN.
G1098 ENG	May 2013	On the application of AIS AtoN on buoys	1.0	Provides information on the application of employing AIS-AtoN on buoys, and specification, installation, and maintenance.

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 to implement systematic procedures for the design, maintenance, and safe and sustainable operation.

No	Date	Title	Ed	Summary
G1077 ENG	Dec 2009	Maintenance of AtoN	1.0	Information to help develop a maintenance strategy. Several annexes are attached to provide detailed information on the activities involved in the maintenance.

Remote control

No	Date	Title	Ed	Summary
G1008 ENG	May 2009	Remote control and monitoring of AtoN	2.0	Objectives of remote control and monitoring, and technical aspects such as communication links, display, maintenance and integration with other systems.

Lighting protection

No	Date	Title	Ed	Summary
G1012 ENG	May 2013	Protection of lighthouses and other AtoN against damage from lighting	3.0	Guidance on lighthouse design, protection system, earthing, periodic inspection and maintenance against lighting damage including risk analysis and calculation sheet.

Built up area

No	Date	Title	Ed	Summary
G1051 ARM	Dec 2005	Provision and identification of AtoN in built up areas	1.0	Guidance when assessing the level of AtoN effectiveness in built-up areas and potential methods for improving the conspicuity of the AtoN.

Bird deterrents

No	Date	Title	Ed	Summary
G1091 ENG	June 2019	Bird deterrents and bird fouling solutions	2.0	Provides information on the problem of bird fouling on AtoN by focusing on identification of the detrimental effects of bird fouling and the possible use of effective bird deterrents or alternative solutions.

Safety management

No	Date	Title	Ed	Summary
G1092 ENG	Dec 2017	Safety management for AtoN activities	2.0	Overview and practical guide to managing safety in the AtoN workplace. It provides a general guide on the development, standards and codes of practice.

Extreme weather

No	Date	Title	Ed	Summary
G1108 ENG	Dec 2013	Challenges of providing AtoN services in polar regions	1.0	Provides guidance to IALA members on aspects related to the definition, installation, operation and maintenance of AtoN in Polar Region.
G1136 ENG	Dec 2017	Providing AtoN services in extremely hot and humid climates	1.0	Practical guideline on the requirements for AtoN in extremely hot and humid regions. It covers characteristics of extremely hot and humid environments, and AtoN management, and maintenance, and design and engineering considerations.

Theft and vandalism

No	Date	Title	Ed	Summary
G1109 ENG	Dec 2013	Theft and vandalism deterrents	1.0	Provides a definition and examples of theft and vandalism, and details of the detrimental effects, and information on previous experiences faced by authorities or organizations.

Commissioning of AtoN

No	Date	Title	Ed	Summary
G1140 ENG	Dec 2017	Commissioning of AtoN equipment and systems	1.0	Covers the concept of commissioning, identification of critical factors, responsibilities, measurements and records of parameters and etc.

AtoN structure

No	Date	Title	Ed	Summary
G1151 ENG	Dec 2019	Maintenance of AtoN structure	1.0	Provides general guidance and advice on the types of structures, component materials, maintenance, refurbishment and repair techniques. Much of the information provided is in the context of civil engineering and building construction technology.

2.4 Floating AtoN

Moorings

No	N/I	Date	Title	Ed	Summary
R0107 (E-107) ENG	Inf	May 2009	Moorings for floating AtoN	2.1	Technical recommendation on moorings.

No	Date	Title	Ed	Summary
G1066 ENG	June 2010	Design of floating AtoN moorings	1.1	General consideration on mooring materials, and comparison of mooring loads and design.

Plastic buoy

No	Date	Title	Ed	Summary
G1006 ENG	Dec 2013	Plastic buoys	4.0	Points to be considered when evaluating plastic buoys. Characteristics of materials and execution methods are explained.

Buoy painting

No	Date	Title	Ed	Summary
G1015 ENG	Dec 2013	Painting AtoN buoys	2.0	Practical guidance on how to paint steel, glass-reinforced plastic, and moulded polyethene buoys.

Buoy design

No	Date	Title	Ed	Summary
G1099 ENG	May 2013	Hydrostatic design of buoys	1.0	Provides information on the calculation of buoy stability for new buoy designs and for establishing the impact of the installation of new equipment on existing buoys. Methods of measuring these parameters on existing buoys are also explained.

2.5 Environment and sustainability

Environmental management

No	N/I	Date	Title	Ed	Summary
R1004 ENG	Inf	Dec 2019	Sustainability in the provision of Marine AtoN	2.1	National members and other authorities to implement a formal system to protect the marine environment, and minimise the impact.

No	Date	Title	Ed	Summary
G1036 ENG	June 2017	Environmental management in AtoN	3.0	Environmental challenges, references and legislative compliance, and technical considerations.
G1137 ARM	Dec 2017	AtoN management in protected areas	1.0	Provides information as a tool for competent authorities in identifying steps to follow when it is time to consider the installation of an AtoN in Protected Area (PA), and Marine Protected Areas (MPA).

2.6 Heritage and legacy

Lighthouse conservation

No	N/I	Date	Title	Ed	Summary
R1005 ENG	Inf	June 2017	Conserving the built heritage of lighthouses and other AtoN	1.1	Recommends members and other authorities to promote conservation and maintenance of heritage lighthouses.

No	Date	Title	Ed	Summary
G1049 ENG	Dec 2007	Use of modern light sources in traditional lighthouse optics	2.0	Guidance on methods of using modern light sources in traditional optic systems with advantages and disadvantages.
G1063 ENG	Dec 2008	Agreement for complementary use of lighthouse property	1.0	What should the agreement contain and safety aspect of the agreement including examples of few countries.
G1074 ENG	Dec 2009	Branding and marketing of historical lighthouses	1.0	General guidance on the branding and marketing of heritage lighthouses. Strategy and possible visitor services are included.
G1075 ENG	Dec 2009	Business plan for the complementary use of a historic lighthouse	1.0	Process in developing a business plan for an individual lighthouse estate or as part of the development of an organizational estate management plan.
G1076 ENG	Dec 2009	Building conditioning of lighthouses	1.0	Guidance on building conditioning and as such is based on a document completed in partnership with Trinity House, the Commissioners of Irish Lights and the Northern Lighthouse Board.
G1080 ENG	Dec 2011	Selection and display of heritage artefacts	1.0	General guidance on the selection and display historic artefacts and offers some examples from lighthouse authorities around the world.
G1093 ENG	Dec 2012	Management of surplus lighthouse property	1.0	General guidance to the most appropriate methods for the management or disposal of surplus lighthouse properties in order to preserve the lighthouse heritage to the best level possible.

2.7 Power systems

Solar power system

No	Date	Title	Ed	Summary
G1039 ENG	Dec 2017	Designing solar power systems for AtoN (solar sizing tool)	2.0	Information on the design of PV solar power systems and describe how to use the IALA calculation tool. The tool is G1039-1, and handbook G1039-2.

Integrated lanterns

No	Date	Title	Ed	Summary
G1064 ENG	Dec 2008	Integrated power system lanterns (Solar LED lanterns)	1.0	Overview and guidance for use of integrated power system lanterns and consideration on application criteria, limitations of applications, specification, construction, design, intensity, range, and power consumption, etc.

Power system selection

No	Date	Title	Ed	Summary
G1067 ENG	Dec 2017	Selection of power systems for AtoN and associated equipment	3.0	Contains a summary of power generation and energy storage options that are available for use with AtoN. G1067-1 is on total electrical loads of AtoN, G1067-2 on power sources, G1067-3 on electrical energy storage for AtoN.

STANDARD 1030
RADIONAVIGATION SERVICES

3.1 Satellite positioning and timing

PNT

No	N/I	Date	Title	Ed	Summary
R1017 ENG	Inf	Dec 2018	Resilient position navigation and timing (PNT)	1.1	Recommends national members conducting a risk assessment into the impact of PNT service degradation or total loss, and how PNT information can be made more resilient.

3.2 Terrestrial positioning and timing

Terrestrial radionavigation systems

No	N/I	Date	Title	Ed	Summary
R1020 ENG	Inf	Dec 2020	Terrestrial radio-navigation systems	1.0	Recommends the members and authorities to consider the provision of terrestrial radionavigation systems which may include regional systems.

eLoran performance

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 principles on the performance and monitoring of eLORAN.

eLoran establishment

No	Date	Title	Ed	Summary
G1125 ENG	June 2017	Technical approach to establishing a maritime eLoran service	1.0	Enables service providers to deliver, monitor and assess the performance of eLoran services in a common manner.

High accuracy positioning

No	Date	Title	Ed	Summary
G1127 ENG	Dec 2017	Systems and services for high accuracy positioning and ranging	1.0	Provides an overview of systems and services enabling high-accuracy positioning or ranging in specific areas such as waterways, traffic separation schemes, traffic zones with limited manoeuvring space and etc.

3.3 RACON and Radar positioning

RACON

No	N/I	Date	Title	Ed	Summary
R0101 (R-101) ENAV	Nor	Dec 2004	Marine radar beacons (RACONS)	2.1	Technical parameters and operating range on use of RACON.

Maintaining RACON

No	N/I	Date	Title	Ed	Summary
e-NAV -146 ENG	Nor	Dec 2011	Strategy for maintaining RACON service capability	1.0	The role of RACONs, and options for RACON services.

No	Date	Title	Ed	Summary
G1010 ENG	June 2005	RACON range performance	2.0	Factors under the control of the radar operator and estimation of RACON range with examples.

Enhanced RACON

No	Date	Title	Ed	Summary
G1147 ENG	June 2020	Use of enhanced RACONs	1.0	Not ready yet

3.4 Augmentation service

Maritime radionavigation service

No	N/I	Date	Title	Ed	Summary
R-115 ENAV	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	Provides information on the regulation of the maritime radionavigation services.

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	1.1	Examples of bilateral agreements and MoU that set out the responsibilities of the countries and agencies concerned.

Performance and monitoring DGNSS

No	N/I	Date	Title	Ed	Summary
R0121 (R-121) ENAV	Nor	May 2015	Performance and monitoring of DGNSS services in the frequency band 283.5-325 kHz	2.1	Recommends the principles should be adopted.

No	Date	Title	Ed	Summary
G1112 ENG	May 2015	Performance and monitoring of DGNSS services in the frequency band 283.5-325 kHz	1.0	Provides the design and implementation principles on performance and monitoring of DGNSS services in the frequency band 283.5-325 kHz.
G1119 ENG	Dec 2016	Marine beacon coverage prediction	1.0	Practical guideline on calculating marine beacon coverage considering various effects.
G1126 ENG	June 2017	Calculation of DGNSS antenna efficiency	1.0	Assists providers of DGNSS with establishing correct output signal levels from their LF/MF transmitter stations, and measuring the antenna efficiency.

GNSS

No	N/I	Date	Title	Ed	Summary
R0129 (R-129) ENAV	Inf	Dec 2012	GNSS vulnerability and mitigation measures	3.1	Information on all types of GNSS vulnerability within the maritime field, and the mitigation measures that may be used to overcome them.

Future of DGNSS

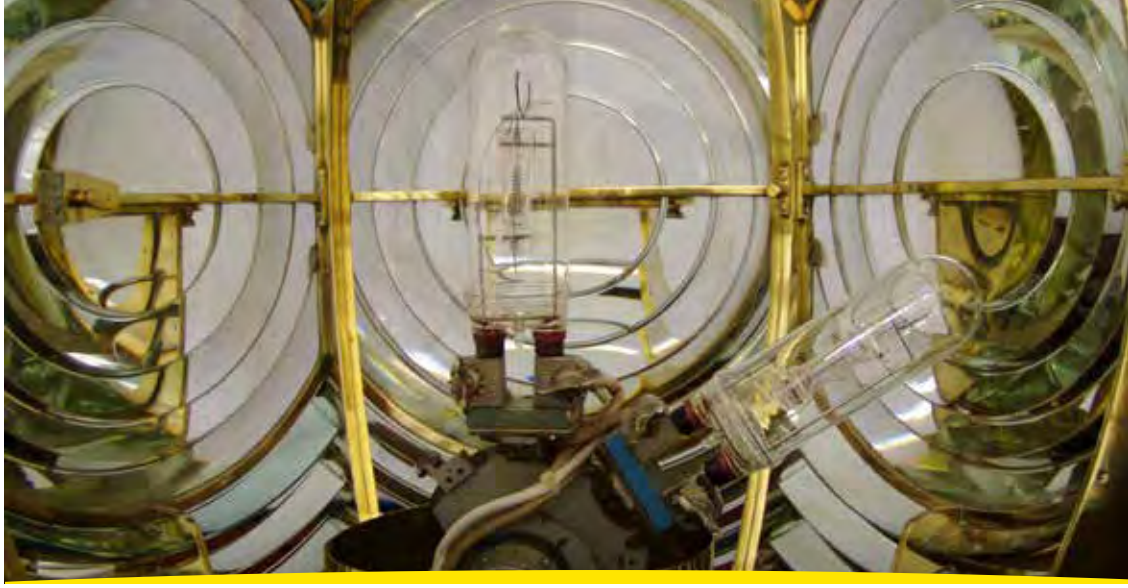
No	N/I	Date	Title	Ed	Summary
R0135 (R-135) ENAV	Inf	Dec 2008	Future of DGNSS	2.1	Outlines an update strategy for the recapitalization of DGNSS, setting out the requirements and options and identifying area still needing further study.

No	Date	Title	Ed	Summary
G1060 ENAV	June 2011	Recapitalization of DGNSS	2.0	Provides replacement options, progress to date and guidance on the recapitalization of DGNSS.

DGNSS service provision

No	N/I	Date	Title	Ed	Summary
R0150 (R-150) ENAV	Inf	Dec 2016	DGNSS service provision, upgrades and future uses	1.1	General 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	Template for the submission of DGNSS service including discussions, and future and implications.



SBAS

No	Date	Title	Ed	Summary
G1129 ENG	Dec 2017	Retransmission of SBAS corrections using MF radiobeacon and AIS	1.0	Sets out guidance for AtoN service providers wishing to understand where SBAS could be used to support the mariners and then how to employ such data.
G1152 ENG	Dec 2019	SBAS maritime service	1.0	Provides the description of all the elements of SBAS relevant to the maritime administrations (direct reception of SBAS Signal in Space (SiS) onboard the vessels).

VDES R-Mode

No	Date	Title	Ed	Summary
G1158 ENG	Dec 2020	VDES R-Mode	1.0	Sets out guidance for authorities to setup VDES R-Mode and developers to design a VDES R-Mode receiver or transmitter.

STANDARD 1040
VTS

4.1 VTS implementation

VTS user pays principle

No	N/I	Date	Title	Ed	Summary
R0102 (V-102) VTS	Inf	Dec 2011	Application of the user pays principle to Vessel Traffic Services	1.3	General and legal considerations on the user-pay principle.

VTS Implementation

No	N/I	Date	Title	Ed	Summary
R0119 (V-119) VTS	Nor	Dec 2020	Establishment of VTS	4.0	Recommends that competent authorities and VTS authorities arrange for the establishment of VTS in a standardized and harmonized manner.

No	Date	Title	Ed	Summary
G1071 VTS	Dec 2009	Establishment of a Vessel Traffic Service beyond territorial seas	1.0	Provides guidance on options and types of services available beyond territorial seas.
G1083 VTS	June 2011	Standard nomenclature to identify and refer to VTS centres	1.0	Provides guidance to promote consistent nomenclature amongst VTS around the world.
G1150 VTS	Dec 2020	Establishing, planning and implementing VTS	2.0	Provides a framework to assist authorities in implementing practices specified in IALA Recommendation R0119 on the establishment of VTS.

VTS inland waters

No	N/I	Date	Title	Ed	Summary
R0120 (V-120) VTS	Inf	Dec 2013	Vessel Traffic Services in inland waters	2.1	Covers general considerations, responsibility and operation of VTS in inland waters.

4.2 VTS operations

VTS operation

No	N/I	Date	Title	Ed	Summary
R0127 (V-127) VTS	Nor	Dec 2018	VTS Operations	3.1	Recommends that competent authorities and VTS authorities contribute to precise and unambiguous delivery of VTS operations with the traffic by implementing harmonised and standardised VTS operations.

No	Date	Title	Ed	Summary
G1089 VTS	Dec 2012	Provision of VTS services (INS, TOS & NAS)	1.0	Gives guidance on the delivery of the three different types of services provided by a VTS; INS, TOS, NAS.
G1110 VTS	Dec 2014	Use of decision support tools for VTS personnel	1.0	Gives guidance on the use of decision support tools for VTS personnel when considering decisions on evolving or emergency situations in a harmonized way.
G1131 VTS	Dec 2017	Setting and measuring VTS objectives	1.0	Provides guidance for competent authorities and VTS authorities for setting objectives for a VTS and achieving them.
G1141 VTS	Dec 2018	Operational procedures for Vessel Traffic Services	1.0	Assists VTS authorities in identifying key aspects that should be considered when developing operational procedures for a VTS centre.
G1144 VTS	June 2019	Promulgating the requirements of a VTS to mariners – a VTS users guide template	1.0	Provides guidance for VTS authorities to promulgate the information related to a VTS in a concise and globally harmonized manner.

Staffing levels

No	Date	Title	Ed	Summary
G1045 VTS	Dec 2018	Staffing levels at VTS centres	1.1	Assists authorities in determining an appropriate staffing level for a VTS centre.

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	1.0	Provides guidance and information to VTS authorities and competent authorities on the development and establishment of harmonized casualty/incident/ near-miss reporting, recording and analysis processes.

4.3 VTS data and information management

Symbology

No	N/I	Date	Title	Ed	Summary
R0125 (V-125) VTS	Nor	June 2012	Use and presentation of symbology at a VTS centre	3.1	General principles, symbology elements, and detailed symbology considerations.

Portrayal

No	N/I	Date	Title	Ed	Summary
R1014 VTS	Nor	Dec 2011	Portrayal of VTS information and data	1.1	National members and other appropriate authorities to provide human-centred design and an ergonomic approach on VTS.

4.4 VTS communications

VTS Communication

No	N/I	Date	Title	Ed	Summary
R1012 VTS	Nor	Dec 2017	VTS communications	1.1	Competent authorities and VTS authorities contribute to precise and unambiguous communications with the traffic.

No	Date	Title	Ed	Summary
G1132 VTS	Dec 2017	VTS VHF voice communication	1.0	Intends to engage and support all VTSOs, new and experienced, in promoting best practice in effective VTS radio voice procedures.

4.5 VTS technologies

VTS Systems

No	N/I	Date	Title	Ed	Summary
R0128 (V-128) VTS	Nor	May 2015	Operational and technical performance of VTS systems	4.1	General information on the operational and technical performance of VTS systems.

No	Date	Title	Ed	Summary
G1111 VTS	May 2015	Preparation of operational and technical performance requirements for VTS systems	1.0	Assists VTS authorities in preparing the definition, specification, establishment, operation and upgrades of a VTS system.

4.6 VTS auditing and assessing

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 to implement a formal system for auditing and assessing VTS as a means to ensure the harmonized delivery of VTS worldwide.

No	Date	Title	Ed	Summary
G1101 VTS	Dec 2013	Auditing and assessing VTS	1.0	Provides guidance for competent authorities and VTS authorities to meet their obligations under SOLAS for the establishment and operation of VTS.
G1115 VTS	Dec 2015	Preparing for an IMO Member State Audit Scheme (IMSAS) on Vessel Traffic Services	1.0	Provides guidance for contracting governments and competent authorities to meet the objectives of an IMO IMSAS with respect to the implementation and delivery of VTS.

4.7 VTS additional services

Restricted or limited access areas

No	Date	Title	Ed	Summary
G1070 VTS	Dec 2009	VTS role in managing restricted or limited access areas	1.0	Assists VTS authorities in defining appropriate procedures to manage traffic around and inside areas with particular restrictions to navigate.

Interaction with allied or other services

No	Date	Title	Ed	Summary
G1102 VTS	Dec 2013	VTS interaction with allied or other services	1.0	Describes the issues to be considered and the principles to be respected for successful interaction between VTS and allied or other services.

Information exchange

No	Date	Title	Ed	Summary
G1130 VTS	Dec 2017	Technical aspects of information exchange between VTS and allied or other services	1.0	Describes from a technical point of view, the issues to be considered and the principles to be applied for interaction between VTS and allied or other services.

Local port services

No	Date	Title	Ed	Summary
G1142 VTS	Dec 2018	Provision of Local Port services other than VTS	1.0	Assists governments and competent authorities to ensure the difference between VTS and Local Port Services (LPS), and assist entities operating LPS to enhance efficiency and safety.

Deck officers

No	Date	Title	Ed	Summary
G1149 VTS	Dec 2019	VTS training for deck officers	1.0	Presents 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.

STANDARD 1050
TRAINING AND CERTIFICATION

5.1 Training and assessment

VTS Training and certification

No	N/I	Date	Title	Ed	Summary
R0103 (V-103) VTS	Nor	Dec 2020	Training and certification of VTS personnel	3.0	Sets out the training requirements and certification standards for VTS personnel.

No	Date	Title	Ed	Summary
G1017 VTS	Dec 2005	Assessment of training for VTS	1.1	Provides principles, evidence of prior learning, the assessment process for VTS.
G1027 VTS	Dec 2005	Simulation in VTS training	1.1	General description on VTS training simulation including principle, planning, design, development, validation, documentation and conduct of simulation exercises.
G1103 VTS	Dec 2013	Train the trainer	1.0	Assists maritime training organizations and their teaching staff in the preparation and introduction of new training courses for trainers, teachers and/or instructors.
G1156 VTS	Dec 2020	Recruitment, training and certification of VTS personnel	1.0	Provides guidance on implementing practices associated with the recruitment, training and assessment of VTS personnel.

AtoN Training and certification

No	N/I	Date	Title	Ed	Summary
R0141 (E-141) ENG	Nor	Dec 2017	Training and certification of Marine AtoN personnel	4.1	Provides information of general provisions, qualification and certification on AtoN personnel and instructors.

No	Date	Title	Ed	Summary
G1020 ARM	Dec 2005	Training related to AtoN	1.1	Assists Lighthouse Authorities in the delivery of their life cycle management requirement including training.

5.2 Human factors and ergonomics

No documents

5.3 Simulation in training

No documents

5.4 Capacity building

No documents

5.5 Competency, certification and revalidation

TO Accreditation

No	N/I	Date	Title	Ed	Summary
R0149 (O-149) 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 2011	Accreditation and approval process for VTS training	3.0	General considerations for the approval of VTS training courses, and procedures for the accreditation and approval process.
G1100 ENG	Dec 2017	Accreditation and approval process for AtoN personnel training	2.0	Ensures conformance with the standards and requirements of AtoN training. Competent Authorities are encouraged to adopt this guideline on the accreditation and approval process for AtoN personnel training.

STANDARD 1060
DIGITAL COMMUNICATION TECHNOLOGIES

6.1 Narrow bandwidth systems

No documents

6.2 Harmonised maritime connectivity

Shore based infrastructure architecture

No	N/I	Date	Title	Ed	Summary
R0140 (e-Nav -140) ENAV ARM	Inf	May 2015	Architecture for shore-based infrastructure "fit for e-Navigation"	2.1	Recommends national members and other appropriate authorities establish shore-based infrastructure for e-Navigation.

No	Date	Title	Ed	Summary
G1113 ENAV ARM	May 2015	Design and implementation principles for harmonized system architectures of shore-based infrastructure	1.0	Identifies consequences stemming from the international context for the design and implementation of any harmonized shore-based technical system architecture.
G1114 ENAV ARM	May 2015	A technical specification for the common shore-based system architecture (CSSA)	1.0	Provides information on common shore-based system architecture general layout, CSSA detail layout, consequences and options, and migration and life-cycle management issues.

Regional e-Navigation implementation

No	N/I	Date	Title	Ed	Summary
R0148 (e-Nav -148) ENAV	Inf	Dec 2015	Need to implement regional e-Navigation solutions based on international standards	1.1	Recommends members and authorities to take into account the standards exist and liaise with other regional authorities.

Portrayal

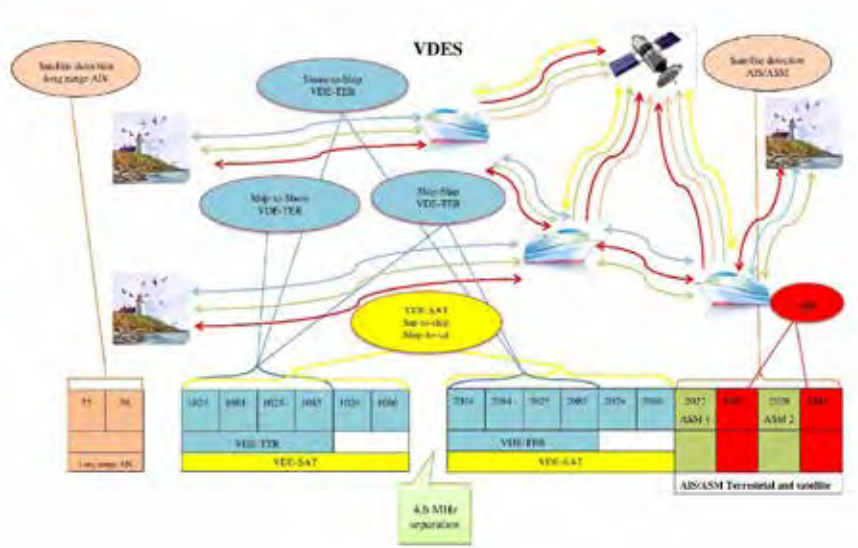
No	Date	Title	Ed	Summary
G1105 ENAV	Dec 2013	Shore side portrayal ensuring harmonization with e-Navigation related information	1.0	Provides guidance on how to achieve a harmonized presentation of information ashore with the presentation on board in the e-Navigation context.

6.3 Wide and medium bandwidth systems

Provision shore based AIS

No	N/I	Date	Title	Ed	Summary
R0123 (A-123) ENAV	Nor	June 2007	Provision of shore-based AIS	2.1	Benefits of AIS as a maritime, safety-related information service and the relationship between other international organizations.

No	Date	Title	Ed	Summary
G1050 ARM	Dec 2005	Management and monitoring of AIS information	1.0	Guidance on information provided by AIS and use of historical AIS data for planning and evaluation process. Design and implementation of AIS data storage, handling and processing systems are also provided.



AIS service

No	N/I	Date	Title	Ed	Summary
R0124 (A-124) ENAV	Nor	Dec 2012	AIS service	2.2	A suit of shore-based AIS service descriptions; A-124 appendices 0 – 19 are included.

VDES

No	N/I	Date	Title	Ed	Summary
R1007 ENAV	Nor	June 2017	VHF Data Exchange System (VDES) for shore infrastructure	1.1	For those authorities without existing AIS shore infrastructure should consider implementing VDES shore infrastructure.

No	Date	Title	Ed	Summary
G1117 ENAV	Dec 2017	VHF Data Exchange System (VDES) overview	2.0	Provides an introduction to the VHF Data Exchange System (VDES) at an overview level. This document is intended to assist in the understanding, development and promotion of VDES.
G1139 ENAV	June 2019	Technical specification of VDES	3.0	Provides technical information required in the development of VDES equipment which integrates the functions of VHF Data Exchange (VDE), Application Specific Messages (ASM) and the Automatic Identification System (AIS).

STANDARD 1070
INFORMATION SERVICES

7.1 Data models and data encoding

Harmonized implementation of Application Specific Messages (ASM)

No	N/I	Date	Title	Ed	Summary
R0144 (e-NAV -144) ENAV	Nor	June 2011	Harmonized implementation of Application Specific Messages (ASM)	1.1	National as well as industrial members recognize the need for harmonization of content, encoding, application and portrayal of ASM.

No	Date	Title	Ed	Summary
G1095 ENAV	May 2013	Harmonized implementation of Application Specific Messages (ASM)	1.0	Describes how ASM should be implemented in a harmonized manner. Operational aspects and technical aspects are included.

Product Specification

No	N/I	Date	Title	Ed	Summary
R0147 (e-NAV -147) ARM	Nor	June 2017	Product specification development and management	2.1	General recommendation on developing product specification.

No	Date	Title	Ed	Summary
G1085 ARM	June 2012	Standard format for electronic exchange of AtoN product information	1.0	Describes an electronic data format intended for the preparation of 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	3.0	Describes the roles, responsibilities and procedures for IALA as a submitting organization under the IHO registry.

G1088 ARM	Dec 2012	Introduction to preparing S-100 product specification	1.0	Introduces the process of developing S-100 Product specification.
G1106 ARM	June 2017	Producing an IALA S-200 product specification	2.0	Provides an overview of the development process and be a step-by-step guideline form the data modelling to the actual production of a 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

Maritime Service

No	N/I	Date	Title	Ed	Summary
R1019 ENAV	Inf	Dec 2019	Provision of Maritime Services in the context of e-Navigation in the domain of IALA	1.1	Recommends IALA members to provide Maritime Services in digital formats, using international standards and ensure that a communications infrastructure to provide such digital maritime services is available in their area of responsibility.

No	Date	Title	Ed	Summary
G1155 ENAV	Dec 2020	Development of a description of a maritime service in the context of e-Navigation	1.0	Assist members and other international organisations in the development and implementation of a MS in the context of e-Navigation.

IVEF

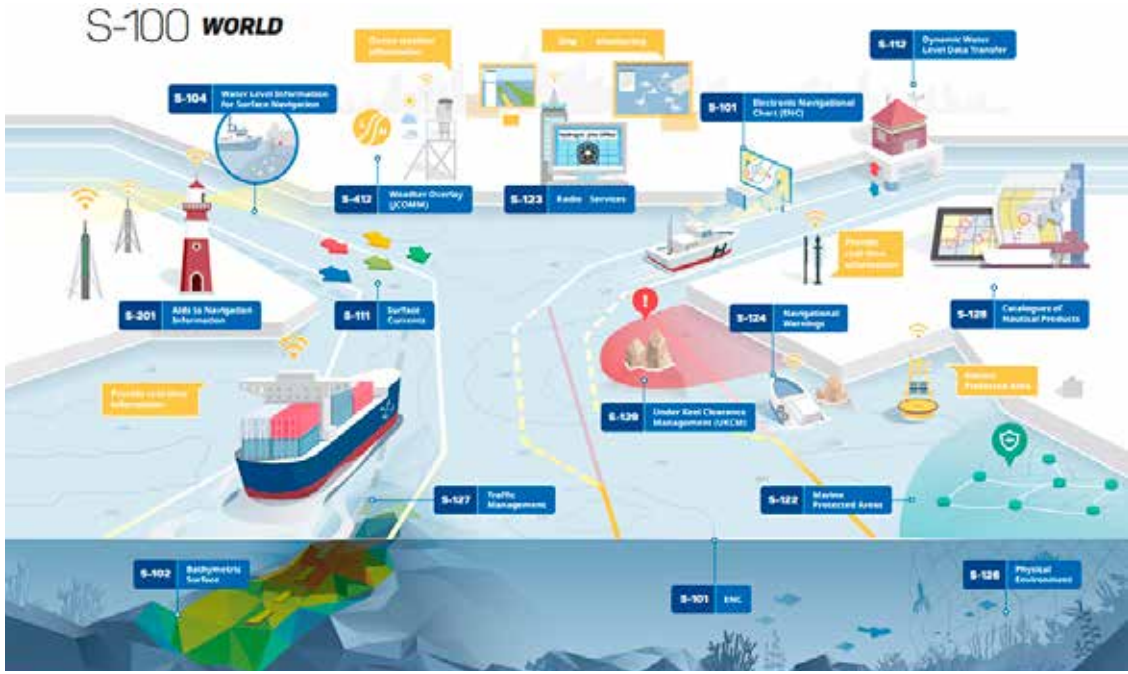
No	N/I	Date	Title	Ed	Summary
R0145 (V-145) VTS	Nor	June 2011	Inter-VTS exchange format (IVEF) service	1.1	Covers the service model of the IVEF service including data, interaction, security, interfacing models.

Technical Service

No	Date	Title	Ed	Summary
G1128 ENAV	Dec 2017	Specification of e-Navigation technical services	1.0	Provides information on how to make specifications of e-Navigation technical services. This guideline is intended for service architects, system engineers and developers in charge of designing and developing a technical service or designing and developing a device to use it.

MRN

No	Date	Title	Ed	Summary
G1143 ARM	Dec 2020	Unique identifiers for Maritime Resource Names	2.0	Provides information on the requirements for MRN which is a unique identifier for maritime use, and its syntax, areas of application and other information required.



7.2 Data exchange systems

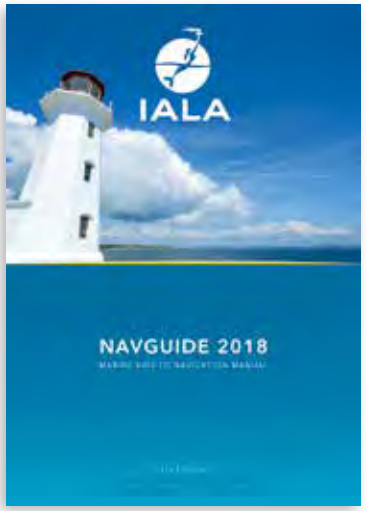
Web service based S-100 data exchange

No	Date	Title	Ed	Summary
G1157 ENAV	Dec 2020	Web service based S-100 data exchange	1.0	Provides guidance to service providers, system architects and developers who are designing S-100 based technical service and implementing MS in the context of e-Navigation.

7.3 Terminology, symbology and portrayal

No documents

IALA MANUALS



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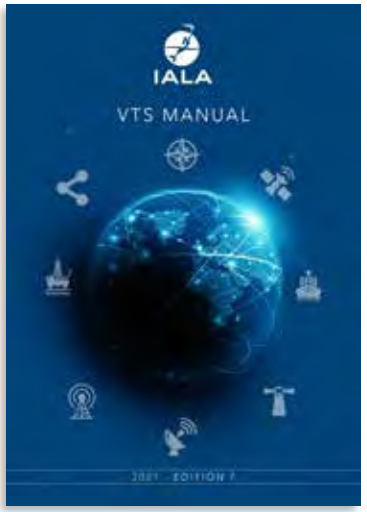

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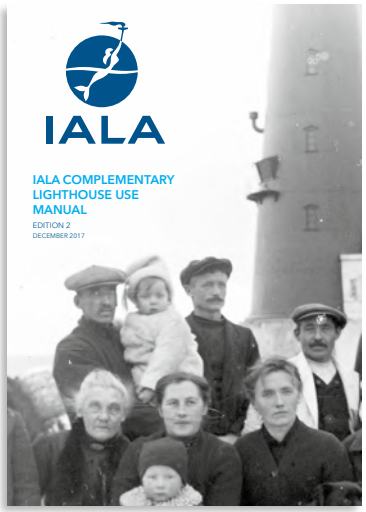

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IALA MODEL COURSES

Aids to Navigation Management

Ref.	Edition	Title
C1001	Ed3.1	Marine Aids to Navigation - Manager Training
C1002	Ed1	Master of Marine Aids to Navigation Management
C1003	Ed2	Aids to Navigation manager training Level 1- Use of the IALA Risk Management Tools
C1004	Ed2	Aids to Navigation Management Training Level 1 – Global Navigation Satellite Systems and e-Navigation
C1005	Ed2	Historic Lighthouse Projects

Aids to Navigation Technician

Ref.	Edition	Title
C2000	Ed3	Level 2 – Model Course Overview
C2001-1	Ed1	Introduction to Aids to Navigation
C2001-2	Ed1	Introduction to Aids to Navigation Buoyage
C2001-3	Ed2	Buoy Handling and Safe Working Practices
C2001-4	Ed3	Buoy Moorings
C2001-5	Ed2	Buoy Cleaning
C2001-6	Ed2	Introduction to Buoy Positions
C2001-7	Ed2	Maintenance of Plastic Buoys
C2001-8	Ed2	Maintenance of Steel Buoys
C2001-9	Ed2	Power to Sources on Buoys
C2001-10	Ed2	An introduction to shore marks
C2002-1	Ed1	DC Power Systems
C2002-2	Ed1	Primary and Secondary Battery Maintenance
C2002-3	Ed3	Photovoltaic (Solar panel) systems and maintenance
C2002-4	Ed2	Wind Generators
C2002-5	Ed2	Mains AC Utility Power Systems; Diesel and Petrol Generators
C2002-6	Ed2	Lightning Protection
C2003-1	Ed2	Lights and Marine Lanterns
C2003-2	Ed2	Light Flashers Lamp changers and IPS lanterns
C2003-3	Ed2	Rotating Beacons and Classic lenses
C2003-4	Ed2	Maintenance of Mercury Rotating Optics
C2003-5	Ed2	Range, sector and precision direction lights
C2004-1	Ed2	Sound Signals
C2005-1	Ed2	Introduction to coatings and specifications; surface preparation
C2006-1	Ed2	Aids to Navigation Service Craft and Buoy Tenders
C2007-1	Ed2	Racons Beacon Maintenance
C2008-1	Ed2	AIS Aids to Navigation Operations
C2009-1	Ed2	Introduction to Radionavigation and DGNSS
C2010-1	Ed2	Introduction to remote monitoring of Aids to Navigation
C2011-1	Ed2	Marine Aids to Navigation structures: materials, corrosion and protection
C2011-2	Ed2	Preservation of Structures
C2011-3	Ed2	Maintenance Planning & Records

VTS

Ref.	Edition	Title
C0103-1 (V-103/1)	Ed2	Vessel Traffic Services Operators Training
C0103-2 (V-103/2)	Ed2	Vessel Traffic Services Supervisor - Training
C0103-3 (V-103/3)	Ed2	Vessel Traffic Services On-the-Job Training
C0103-4 (V-103/4)	Ed2	Vessel Traffic Services - On-the-Job Training Instructor
C0103-5 (V-103/5)	Ed1	The revalidation process for VTS Qualification and Certification

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