Input paper: [[1]](#footnote-1) VTS50-10.1.2

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□**ARM **□**ENG **□**PAP **X** Input

**□**ENAV **X**VTS **□** Information

Agenda item [[2]](#footnote-2) 10.1

Technical Domain / Task Number 2.1.1

Author(s) / Submitter(s) China Maritime Safety Administration

**Proposal on Revising the Guideline1105“Shore-side portrayal ensuring harmonisation with e-Navigation related information”**

**1 SUMMARY**

Considering the 2018-2022 Work Plan of the IALA VTS Committee puts forward the task of revising "G1105 Shore-side portrayal ensuring harmonisation with e-Navigation related information”, and Task2.1.1 team only suggested a review of the references involved in the Guideline and did not form a complete version of the revised Guideline on the VTS49 meeting.

The proposal refers to a number of documents and standards from different Organizations. Through revisions, the relevant standards covered by the Guideline are updated and the structure is improved.

**2 PURPOSE OF THE DOCUMENT**

The purpose of this document is to provide a new draft version of G1105 according to the meeting records of VTS49 for further discussion on VTS50.

**3 DISCUSSION**

In order to submit the updated draft of G1105, China focused on the following work:

1. Restructuring - Parts 4, 6 and 7 of the Guideline have been structured and sequenced to make the Guideline more concise and clearer.
2. Revising the content -Part 5 of the Guideline was deleted, and the text of the Guideline was supplemented and updated in 8 places, and the old wording was deleted in 4 places.
3. Update of references - 32 references involving Organizations such as IMO\IALA\IEC\IHO were revised completely, 23 of which were updated (including 4 recommended by the VTS49 meeting). Significantly, one list of referenced documents are attached at the end of revised Guideline for use in future updates.

Through modification, a basically complete update draft of G1105 (see the Appendix for details) is formed for further discussion at the VTS50 meeting. Some parts of modification are highlighted in the Appendix.

**4 ACTION REQUIRED BY THE COMMITTEE**

The Committee is requested to consider the Appendix which is the G1105 revised draft.

|  |
| --- |
| APPENDIX |

G1105

Shore-side portrayal ensuring harmonisation with e-Navigation related information

Edition X.X

January2021

Revisions to this IALA Document are to be noted in the table prior to the issue of a revised document.

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| --- | --- | --- |
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# BACKGROUND

In July 2006, IMO Maritime Safety Committee (MSC81) first decided to include e-Navigation in the work programmes of the Safety-of-Navigation (NAV) and Communications and Search and Rescue (COMSAR) Sub-Committees. The 'Development of an e-Navigation strategy' became a high-priority item.

In December 2008, MSC 85 adopted a 'Strategy for the Development and Implementation of e-Navigation' (MSC 85/26/Add.1 Annex 20). Included with this document was a description of the responsibilities that come with IMO ownership and control (Annex 1), and a summary of potential shipborne and shore-based users (Annex 2).MSC94approved the E-navigation Strategy Implementation Plan (SIP),in November 2014, MSC99approved the E-navigation Strategy Implementation Plan – Update 1,in May2018（IMO ResolutionMSC.1/Circ.1595）

In 2006, IALA established an e-Navigation Committee. After the IALA e-Navigation Seminar in July 2007, the IALA Committee established six working groups，which are newly adjusted to three working groups: Digital information system(WG1),Emerging digital technology(WG2),Digital communication system(WG3),to advance the work of IALA’s e-Navigation work programme.

# objective

The objective of this document is to provide guidance on how to *recommend suitable 'guidance' regarding how the presentation and display of e-Navigation related information should be harmonized for both shipborne and shore-based systems/services, and to what extent*[[3]](#footnote-3)*.*This will support the goal of e-Navigation for enhancing navigation safety and efficiency.

# SCOPE

3.1 General Scope

Since e-Navigation is an evolutionary process, this Guideline is intended to be descriptive – not prescriptive. Until more practical experience is gained, it is premature to prescribe specific means to present / display e-Navigation related information. As such, the intent is to publish a general, goal-based guideline whereby over-arching objectives are defined, but freedom to innovate is left to both developers and users. This document is not providing guidance for e-Navigational portrayal on the ships as this is defined by other competent bodies but rather takes the relevant existing and being developed ship portrayal standards and guidelines into consideration to guide shore side system development.

The basic, over-riding premise of this Guideline is that:

Shipborne and shore-based equipment/systems/services should portray e-Navigation-related information to all users (both onboard and ashore) in a consistent manner.

However, there are several caveats:

1 How information is portrayed onboard or ashore depends on the particular tasks, function, and needs of the user.

2 The current situation or task-at-hand can influence the amount of information necessary to make informed decisions.

3 The portrayal of information onboard ships or ashore does not necessarily have to be identical.

3.2 Vital Scope

Considering the similarity between ship-side and shore-based E-navigation strategies in terms of technical and equipment portrayal standards, the IMO prescriptive documents play an important role in setting the portrayal standards for shore-based E-navigation. In particular, IMO Resolution MSC.466(101) “The Performance Standards For The Presentation Of Navigation-Related Information On Shipborne Navigational Displays” updated the performance standards for navigation-related information display in onboard navigation display on 14 June 2019 This Resolution, which addresses standards for the description of metadata (Part 4.0) and equipment (Part 5.0), has significant implications for the harmonization of standards for shoreside e-Navigation data and information portrayal.

# metaDATA requrements ON PORTRAYAL

There are six types of metadata relating to visually portray of e-Navigation information.

1. alpha-numeric
2. graph
3. point, line or polygon
4. symbol
5. geo-spatial
6. imagery

The following sections provide basic guidance with an example for each.

## ALPHA NUMERIC

Unless there is a need to display pre-formatted text or numbers, use the best readable font taking into account Human Centred Design (HCD) as referred to in MSC-MEPC.2/Circ.12/Rev.2and MSC-MEPC.2/Circ.13 concerning Human Element Analysing Process (HEAP).

## graph

In some situations, a time-series graph may be preferred instead of a table format. In particular, it is a useful way to show both predicted and real-time information (e.g. water levels); as well as a useful means to indicate trends (e.g., rising or falling water levels).

## point, line or polygon

This type of information is often displayed as an overlay on chart or map-related background. An Area Notice that is transmitted via AIS Application Specific Message is one example.

## symbol

Similar to the guidance stated in IMO SN.1/Circ.290-2010.6, the following guiding principles apply to the display of symbols or icons:

* Use consistent symbology across all displays;
* Uniqueness – only one possible meaning;
* Non-ambiguous – ability to determine differences (i.e. distinct);
* Intuitively obvious – an easily recognized symbol, icon, or pattern;
* Have a basic symbol for different categories. Further attributes should be enhancements (not changes) to the basic symbol.

**IMO Resolution MSC.191 (79)**, *Performance Standards for the presentation of navigation-related information on shipborne navigational display, 6 December 2004.*

**IMO MSC.1/Circ.1593,** *Interim guidelines for the harmonized display of navigation information received via communication equipment,25May2018.*

**IMO ResolutionMSC.466(101)**, *Amendments to the Performance Standards for the presentation of navigation-related information on shipborne navigational display,14 June 2019 (****Resolution*** *MSC.191(79)*) (shipborne navigational displays on the bridge of a ship for radar equipment, electronic chart display and information system (ECDIS) and integrated navigation systems (INS) installed on or after 1 January 2024, all other navigational displays on the bridge of a ship installed on or after 1 July 2025).

**IEC 62288**, *Maritime navigation and radiocommunication equipment and systems - Presentation of navigation-related information on shipborne navigational displays - General requirements, methods of testing and required test results, Edition 2.0, July 2014.*

**IMO SN1/Circ.243/Rev.2**, *Guidelines for the presentation of Navigation-related symbols, terms and abbreviations, 14JUNE 2019.*

The purpose of this IALA Guideline is 'to provide guidance on the appropriate use of navigation-related symbols to achieve a harmonized and consistent presentation.

There are two Annexes:

* Annex 1 - Guidelines for the Presentation of Navigation-related Symbols;
* Annex 2 - Guidelines for the Presentation of Navigation-related Terms and Abbreviations.

## geo-spatial

Many types of geo-spatial information are best provided in the form of a map or chart. The electronic chart display of an ENC in ECDIS is one example. Another example would be a radar display with chart facilities.

## imagery

This is a broad category that includes various types of images. A still photograph of a fixed or floating Aid to Navigation (AtoN) is one example. Other examples include radar or satellite imagery of sea ice weather conditions. A video recording/replay of a past or simulated voyage is a type of dynamic imagery. There is also increasing interest in the use of 3-D imagery.

# eQUIPMENT STANDARDS about portrayal

At the present time, there is no ‘formal’ list of what equipment/systems/services are currently considered (or will become) components of e-Navigation – either shipborne or shore-based. As such, the following list is based on what is mentioned in various SOLAS V/19 & 20, IMO MSC and IALA e-Navigation related documents. The existing standards should be considered ‘minimum standards’ in terms of what is required.

* It should be noted that the existing standards should not be reviewed in isolation but collectively with all relevant standards to gain the full picture;
* Besides the below existing standards, other aspects and as a result of development or increasing user needs (HCD), may be considered.

## general requirements

This section provides a brief summary of technique standards relating maritime navigation and radio communicationequipments and systems that are applicable for shipborne and shore-side portray.

**IMO Resolution MSC.191 (79)**, *Performance Standards for the presentation of navigation-related information on shipborne navigational display, 6 December 2004.*

**IMOResolution MSC.1/Circ.1593** *Interim guidelines for the harmonized display of navigation information received via communication equipment,25May2018.*

**IEC 60945**, *Maritime navigation and radiocommunication equipment and systems- General Requirements, Methods of testing and required test results, Edition 4.0, August,2002(Corrigendum 1 in April,2008).*

This standard specifies the general requirements, methods of testing, and required test results, for shipborne radionavigation equipment and electronic navigation aids in support of IMO Resolution A.694. More specifically, it specifies minimum performance requirements for equipment that are required carriage under SOLAS1974, Chapter V. Key sections that pertain to the presentation, display or portrayal of navigation- related information include:

* Ergonomics and Human Machine Interface (HMI)
* Screen display and indicators
* Alarms and Indicators
* Illumination

**IEC 62288**, *Maritime navigation and radiocommunication equipment and systems - Presentation of navigation-related information on shipborne navigational displays - General requirements, methods of testing and required test results, Edition2.0, July 2014*.

This standard specifies the general requirements, methods of testing, and required test results, for the presentation of navigation-related information on shipborne navigational displays in support of IMO resolution MSC.191(79). This standard also addresses ergonomic criteria published in circular MSC/Circ.982.

**IALA Recommendation V-125,***on the use and presentation of symbology at a VTS Centre, Edition 3.0, June 2012.*

This Recommendation mainly considers requirements for the display of information at VTS Centres that are port, coastal states or area specific.

## ECDIS

**IMO Resolution MSC.232(82)**, *Revised Performance Standards for Electronic Chart Display and Information Systems (ECDIS), 5 December 2006.*

This performance standard applies to ECDIS equipment carried on all ships including dedicated stand-alone workstations or multi-function workstations as part of an INSand the presentation requirements set out in resolution MSC.191(79)

**IMO Resolution MSC.466(101)**, *Amendments to the Performance Standards for the presentation of navigation-related information on shipborne navigational display*,14 June 2019 (**Resolution** MSC.191(79))

**IHO S-52**, *Specifications for Chart Content and Display aspects of ECDIS Edition 6.1, October2014*

IHO S-52 contains several parts, and all pertain to the presentation/display of chart and navigation-related information:

IHO S-100 *IHO Universal Hydrographic Data Model Edition4.0.0*, December 2018.

IHO S-100 part 9and part 9aspecifies the portrayal model for defining and organizing symbols and portrayal rules

necessary to portray S-100 product Features.

IHO S-101 *IHO S-101 ENC Product Specification Edition 1.0.0, December 2018*

**IEC 61174**,*Maritime navigation and radiocommunication equipment and systems – Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results, Edition 4, August 2015.*

This standard specifies the performance requirements, methods of testing and required test results of equipment conforming to performance standards adopted by the IMO in resolution MSC.232(82). This standard is also associated with IMO resolution A.694(17) and IEC 60945. This standard includes extracts from IHO S-52 when they are applicable to ECDIS.

## Radar

**IMOResolutionMSC.192(79)**, *Performance Standards for Radar Equipment, 6 December 2004.*

This Performance Standard applies to all ship-borne radar installations as mandated by the 1974 SOLAS Convention for this purpose, radar should provide the integration and display of radar video, target tracking information, positional data derived from own ship’s Electronic Position Fixing System (EPFS) and geo-referenced data.

**IEC 62388**, *Maritime navigation and radiocommunication equipment and systems –Shipborne radar – Performance requirements, methods of testing and required test results, 26June2013.*

**IMO Resolution A.823(19)**, *Performance Standards for automatic radar plotting aids, 23 November 1995.*

This performance standard deals with the use of Automatic Radar Plotting Aids (ARPA) to improve the standard of collision-avoidance at sea.

**IALA Recommendation V-128***Operational and Technical Performance Requirements of VTS System, Edition 4.1, May 2015.*

The purpose of this Recommendation is to assist the VTS provider in the definition, establishment and upgrades of a VTS system.

## AIS

**IMO Resolution MSC.74(69), Annex 3**, *Performance Standards for a Universal Shipborne Automatic Identification System(AIS), 19 May 1998.*

**IMO Resolution A.1106(29**), *Revised Guidelines for the Onboard Operational Use of Shipborne Automatic Identification Systems (AIS),2 December 2015****.***

**IMO SN/Circ.217**, *Display of AIS Target Information, 11 July 2001.*

This guideline deals with the graphical presentation and display of AIS target data in stand-alone or integrated navigational aids or systems.

**IMO SN/Circ.236**, *Guidance of the Application of AIS Binary Messages, 28 May 2004.*

AIS can also be used as a mean to communicate Binary Messages for certain types of specific applications. Binary Messages may provide a variety of capabilities for pre-defined information packages.

This standard includes seven (7) types of messages that were to be used during a four-year trial period. This standard was superseded by IMO SN.1/Circ.289.

**IMO SN.1/Circ.289**, *Guidance on the Use of AIS Application-Specific Messages, 2 June 2010.*

Formerly called AIS Binary Messages, AIS Application-Specific Messages (ASMs) are transmitted and received by shipborne mobile AIS devices and AIS base stations. Over 19 AIS message types are described capable of conveying a wide range of hydrographic, meteorological, VTS, area notice, and route information. The display, generation and transmission of the information transmitted by AIS Application-Specific Messages requires external hardware and dedicated software in addition to the AIS equipment (e.g. ECDIS, ECS or VTS display).

**IMO SN.1/Circ.290**, *Guidance for the Presentation and Display of AIS Application-Specific Message information, 2 June 2010*.

This standard provides general guidance on the presentation and display of AIS ASMs that are contained in IMO SN.1/Circ.289. It lists various types of shipborne equipment (and their associated standards) that could be used to display AIS ASMs. In addition to describing some guiding principles, this standard provides a number of portrayal examples for AIS ASMs.

**IALA Guideline 1095**, *on Harmonised implementation of Application-Specific Messages (ASMs), Edition 1.0, May 2013.*

This guideline provides guidance on the implementation and use of ASMs.

In addition to the messages in ITU and IMO documents, competent authorities have developed their own regional messages for use in addressing specific requirements they have identified. In some cases, different authorities have developed separate messages to address similar requirements. This has led to a lack of harmonization, where shipboard equipment may be required to be able to decode/encode several different ASMs in order to receive/send the same information (e.g., met/hydro information).

This guideline addresses actions that are intended to aid harmonization, including the establishment and use of the IALA AIS ASM collection. The intended use of the collection is to promote harmonization through:

* a catalogue of messages for entities to consider for use to meet identified requirements; and
* providing manufacturers with a reference for messages they may implement in their equipment.

While portrayal is outside the scope of this Guideline, IMO has also issued SN.1/Circ. 290 providing guidance for the Presentation and Display of AIS ASM Information.

## INS

**IMO Resolution MSC.86(70**)**, Annex 3**

**IMO Resolution MSC.252(83),***Adoption of the Revised Performance Standards for an Integrated Navigation System (INS), 8 October 2007.*

**IMO Resolution MSC.466(101)**, *Amendments to the Performance Standards for the presentation of navigation-related information on shipborne navigational displa*y,14 June 2019 (**IMO Resolution** MSC.191(79)).

INS functions that have particular relevant to VTS and other shore-based operations include:

* route monitoring;
* collision avoidance;
* alert management;
* special manoeuvres.

**IMO Resolution MSC**/Circ.982, *Guidelines on Ergonomic Criteria for Bridge Equipment and Layout, 20 December 2000.*

This IALA Guideline was developed to facilitate a successful ergonomic design of the bridge and the equipment on the bridge in order to improve the reliability and efficiency of navigation. The Guideline contains ergonomic requirements as well as a functionally-oriented bridge layout to support watch-keeping personnel in their tasks by a user-centred design of the bridge equipment and layout. While these guidelines were primarily intended for shipborne equipment, much of the guidance applies to shore-based workstations as well.

**IEC61294 -2**, *Integrated Navigation Systems (INS) – Operational and performance requirements, methods of testing and required test results, Edition 1.0, December 2012*

This standard specifies the minimum requirements for the design, manufacture, integration, methods of testing and required test results for an integrated navigation system (INS) to comply with the IMO requirements of IMO Resolution MSC 252(83). Specific guidance related to presentation and display considerations is provided in:

* Section 6.4 - Functional requirements for displays of INS;
* Section 6.5 - Human Machine Interface (HMI);
* Section 7 (Module C) - Alert Management;
* Annex D – Display Default Configurations.

# PORTRAYAL EXAMPLES

Examples of VTS tasks that should be portrayed and examples of new applications or systems that may be e-Navigation related were compiled in conjunction with the preparation of this guideline and can be found at:

<https://www.iala-aism.org/technical/information-portrayal/portrayal-examples/>

<https://www.iala-aism.org/technical/information-portrayal/iala-portrayal-guideline/respectively>.

# DEFINITIONS & ACRONYMS

## Definitions

The following terms are defined based on what is contained in widely recognized dictionaries or technical references. This includes the Oxford English Dictionary,[[4]](#footnote-4) Merriam Webster Dictionary,[[5]](#footnote-5) IALA Dictionary, IHO Dictionary,[[6]](#footnote-6) and relevant ISO standards. Further guidance is also provided by way of an example or context of use of these terms associated with the portrayal of e-Navigation related information. Since there are differences in the way some terms are defined, grey highlights indicate the definition(s) that are used in conjunction with this Guideline.

**Data**

*Oxford English Dict. – computing the quantities, characters, or symbols on which operations are performed by a computer, being stored and transmitted in the form of electrical signals and recorded on magnetic, optical, or mechanical recording media.*

*Merriam-Webster Dict. – factual information output by a sensing device that must be processed to be meaningful; information in numerical form that can be digitally transmitted or processed.*

Example/context: **data** is a raw collection of unprocessed facts.

**Feature**

*ISO 19117 - abstraction of real world phenomena.*

**Feature attribute**

*ISO 19117 - characteristic of a feature*.

**Geographic information**

*ISO 19117 - information concerning phenomena implicitly or explicitly associated with a location relative to the Earth.*

**Information**

*Oxford English Dict. – Computing data [that is] processed, stored, or transmitted by a computer.*

*Merriam-Webster Dict. – the communication or reception of knowledge or intelligence.*

Example/context: Data becomes **information** when it is processed and presented in a manner which can be better understood by humans.

**Portrayal**

*ISO 19117 – presentation of information to humans.*

*IMO SN.1.Circ.290 - the process of representing or depicting (i.e., showing an example of what is or could be).*In the case of e-Navigation, this is primarily through electronic means. For the purposes of this Guideline, the term ‘portrayal’ primarily refers to visual means of displaying e-Navigation related information.

Example/context: e-Navigation information can be **portrayed** in a variety of ways.

**Presentation**

*Oxford English Dict. – the manner in which something is displayed; the method by which radio, navigation or radar information is given to the operator.*

*Merriam-Webster Dict. – a symbol or image that represents something.*

According to the e-Navigation defined by IMO, the term 'presentation' pertains to the manner in which information is displayed.

Example/context: The IHO S-52 Colours and Symbols **Presentation** Library is a prescriptive standard for ECDIS.

**User selected presentation**

*IMO MSC 191(79)* - An auxiliary presentation configured by the user for a specific task-at-hand.

The presentation may include radar and/or chart information, in combination with other navigation or ship related data.

## Acronyms

AIS Universal Shipborne Automatic Identification System

ARPA Automatic Radar Plotting Aid

ASM Application Specific Message

AtoN Aid to Navigation

Circ. Circular (IMO document)

COMSAR Sub-Committee on Communications and Search and Rescue(IMO)

ECDIS Electronic Chart Display and Information System

ECS Electronic Chart System

EPFS Electronic Position Fixing System

e-NAV e-Navigation

ENC Electronic Navigation Chart

GI Geospatial Information (IHO)

GPS Global Positioning System

HCD Human Centred Design

HEAP Human Element Analysing Process

HMI Human Machine Interface

IALA International Association of Marine Aids to Navigation and Lighthouse Authorities

IEC International Electrotechnical Commission

IHO International Hydrographic Organization

IMO International Maritime Organization

INS Integrated Navigation System

ISO International Organization for Standardisation

MD Maintenance Document

MSC Maritime Safety Committee (IMO)

NAV Sub-Committee on Safety-of-Navigation (IMO)

SENC System Electronic Navigation Chart

SN Safety of Navigation (IMO)

S-52 Standard and the portrayal of colours and symbols in ECDIS (IHO)

S-57 Transfer Standard for Digital Hydrographic Data (IHO)

S-100 Geospatial Information Registry (IHO)

SOLAS United Nations Convention for the Safety of Life at Sea

VTS Vessel Traffic Services

VTSO Vessel Traffic Services Operator

WG Working Group

# LIST OF REFERENCED DOUCUMENTS

|  |  |  |  |
| --- | --- | --- | --- |
| **NUMBER** | **Title** | **Date of Approval /Adoption** | **Remark** |
| IMO Resolution MSC 85/26/Add.1 Annex 20) | Strategy for the Development and Implementation ofE-Navigation | January 2009 |  |
| IMO Resolution MSC.1/Circ.1595 | E-Navigation Strategy Implementation Plan - Update 1 | 25 May 2018 |  |
| IMO Resolution  MSC.191 (79) | Performance standards for the presentation of navigational related information on shipborne navigational displays | December 2004 | Amended byIMO Resolution MSC.466 (101),June2019 |
| IMO ResolutionMSC.1/Circ.1593 | Interim Guidelines for the Harmonized Display of Navigation Information Received via Communication Equipment | |  | | --- | | 25 May 2018 | |  |
| IMO Resolution  MSC.466 (101) | Amendments to the Performance Standards for the presentation of navigation-related information on shipborne navigational display | 14 June 2019 |  |
| IMO Resolution MSC.Rev.232(82), | Adoption of the revised performance standards for electronic chart display and information systems (ECDIS) | 5 December 2006 | Amends A.817(19)-still in force for equipment installed before  1 January 1999 |
| IMO ResolutionMSC.192(79) | Adoption of the Revised performance standards for radar equipment | December 2004 |  |
| IMO Resolution MSC.74(69), Annex 3 | Recommendation on Performance Standards for An Universal  Shipborne Automatic Identification System(AIS) | June 1998. |  |
| IMO Resolution MSC.252(83) | Revised performance standards for integrated navigation systems (INS) | 8 October 2007 | Amends Annex 3 of MSC.86(70)  1) Installed on or after 1 January 2011  2) Refer to remarks on MSC.86(70) |
| IMO Resolution MSC/Circ.982 | Guidelines on ergonomic criteria for bridge equipment and layout | 20 December 2000 |  |
| IMO Resolution MSC.86(70) | New and amended performance standards for navigational equipment | 8 December 1998 | Superseded by MSC.116(73), Annex 2 Superseded by MSC.166(78), Annex 3 amended by MSC.252(83), but still in force for equipment installed before 1 January 2011 |
| IMO Resolution A.694(17) | General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids | Novernmber.1991 |  |
| IMO Resolution A.823(19) | Performance standards for automatic radar plotting aids (ARPAs) | Novernmber.1995 |  |
| IMO Resolution A.917(22) | Guidelines for the Onboard Operational Use of Shipborne Automatic Identification Systems (AIS) | 25 January 2002 | Amended byResolution A.1106(29)December 2015 |
| IMO Resolution A.1106(29) | Revised Guidelines for the Onboard Operational Use of Shipborne Automatic Identification Systems (AIS). | December 2015 |  |
| MSC-MEPC.2/  Circ.12/Rev.2 | Revised Guidelines for Formal Safety Assessment(FSA) for use in the IMO Rule-making Process | 4 April 2018 |  |
| MSC-MEPC.2/  Circ.13 | Guidelines for the Application of the Human Element Analysing Process(HEAP) to the IMO Rule-making Process | 8 July 2013 |  |
| IMO SN.1/Circ.243/Rev.2 | Amended Guidelines for the Presentation of navigation-related symbols, terms and abbreviations | June,2019 |  |
| IMO SN/Circ.217 | Interim Guidelines for The Presentation And  Display of AIS Target Information | 11 July 2001 |  |
| IMO SN/Circ.236 | Guidance of the Application of AIS Binary Messages | 28 May 2004 |  |
| IMO SN.1/Circ.289 | Guidance on the Use Of AIS Application-Specific Messages | 2 June 2010. |  |
| IMO SN.1/Circ.290 | Guidance for the Presentation and Display Of AISApplication-Specific Messages Information | 2 June 2010. |  |
| IEC 62288, Edition 2.0, | Maritime navigation and radiocommunication equipment and systems - Presentation of navigation-related information on shipborne navigational displays - General requirements, methods of testing and required test results. | July,2014 |  |
| IEC 60945, Edition 4.0 | Maritime navigation and radiocommunication equipment and systems – general requirements – methods of testing and required test results | August,2002 | Corrigendum 1 in April,2008 |
| IEC 61174, Edition 4.0 | Maritime navigation and radiocommunication equipment and systems – Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results. | August,2015 |  |
| IEC 62388, Edition 2.0, | Maritime navigation and radiocommunication equipment and systems –Shipborne radar – Performance requirements, methods of testing and required test results. | 26th June 2013. |  |
| IEC 61294-2, Edition 1.0, | Integrated Navigation Systems (INS) – Operational and performance requirements, methods of testing and required test results. | December 2012 | Edition 2.0 was planned to be published in 29 Jannury2021 |
| IHO S-52, Edition 6.1 | Specifications for chart content and display aspects of ECDIS | October 2014 | Annex A to S-52 -IHO ECDIS Presentation Library (Edition 4.0(.2), October 2014 - with Clarifications up to July 2017) |
| IHO S-100, Edition 4.0 | IHO Universal Hydrographic Data Model | December 2018 |  |
| IHO S-101, Edition 1.0.0 | IHO S-101 ENC Product Specification | December 2018 |  |
| IALA Recommendation V-125, Edition 3.0 | Onthe use and presentation of symbology at a VTS Centre | June 2012 |  |
| IALA Guideline G1106, Edition 2.0 | Producing an IALA S-200 Series Product Specification | June 2017 |  |
| IALA Recommendation V-128, Edition 4.1 | On Operational and Technical Performance Requirements for VTS Equipment. | 29 May 2015 |  |
| IALA Guideline 1095, Edition 1 | On Harmonised implementation of Application-Specific Messages (ASMs) | 31 May 2013 |  |

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)
3. [↑](#footnote-ref-3)
4. http://oxforddictionaries.com [↑](#footnote-ref-4)
5. http://www.merriam-webster.com [↑](#footnote-ref-5)
6. http://hd.iho.int/en/index.php/Main\_Page [↑](#footnote-ref-6)