



## IALA GUIDELINE

# MARITIME SERVICE PORTFOLIOS: DIGITISING MARITIME SERVICES

**Edition 1.0**

Document date



# DOCUMENT HISTORY

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# CONTENTS

<b>1. INTRODUCTION .....</b>	<b>6</b>
1.1. General Description .....	6
1.2. Purpose .....	6
1.3. Implementation .....	6
<b>2. Governing body, SERVICE PROVIDERS &amp; STAKEHOLDERS .....</b>	<b>6</b>
2.1. Definitions.....	6
2.2. <i>[all above agreed enav 20 with IHO comments]</i> Responsible service providers [to be decided later]....	7
<b>3. Defined sea areas for information services .....</b>	<b>8</b>
<b>4. MARITIME SERVICES .....</b>	<b>9</b>
4.1. MSP 1 VTS Information Service (IS) <b>[VTS COMMITTEE]</b> +Singapore+ CANADA +NL .....	9
4.1.1. Objectives .....	9
4.1.2. Description of service .....	9
4.1.3. Area of operation .....	9
4.1.4. Information.....	9
4.1.5. Reference to technical services, including guidance for the service provider on how to technically implement the service....	9
4.1.6. Relationship to other MSPs .....	9
4.1.7. Examples of existing services or/and test beds .....	9
4.2. MSP 2 Navigational Assistance Service (NAS) <b>[VTS COMMITTEE]</b> +singapore+CANADA+NL.....	10
4.2.1. Definition .....	10
4.2.2. Scope .....	10
4.2.3. Objective.....	10
4.2.4. User requirements.....	10
4.3. MSP 3 Traffic Organization Service (TOS) <b>[VTS COMMITTEE] +SINGAPORE+ Canada</b> +NL .....	10
4.3.1. Definition .....	10
4.3.2. Scope .....	11
4.3.3. Objective.....	11
4.3.4. User requirements.....	11
4.4. MSP 4 Local Port Service (LPS) <b>[M BErgmann]+s KOREA+Sweden+singapore+IHMA</b> .....	11
4.4.1. Definition .....	11
4.4.2. Scope .....	11
4.4.3. Objective.....	11
4.4.4. User requirements.....	12
4.5. MSP 5 Maritime Safety Information service (MSI) <b>[IHO]</b> +NORWAY+CHRISTENSEN+CANADA+KRISO .	12
4.5.1. Definition .....	12
4.5.2. Scope .....	12
4.5.3. Objective.....	12
4.5.4. User requirements.....	12
4.6. MSp 6 Pilotage service <b>[IMPA]</b> .....	12



# CONTENTS

4.6.1.	Definition .....	12
4.6.2.	Scope .....	12
4.6.3.	Objective.....	12
4.6.4.	User requirements.....	12
4.7.	MSP 7 Tugs service [None -however port CDM project might help].....	12
4.7.1.	Definition .....	13
4.7.2.	Scope .....	13
4.7.3.	Objective.....	13
4.7.4.	User requirements.....	13
4.8.	MSP 8 Vessel shore reporting [s Korea+ norway+italy+sweden+SINGAPORE+CIRM] .....	13
4.8.1.	Definition .....	13
4.8.2.	Scope .....	13
4.8.3.	Objective.....	14
4.8.4.	User requirements.....	14
4.9.	MSP 9 Telemedical Assistance Service (TMAS) [NORWAY]+NTnu .....	14
4.9.1.	Definition .....	14
4.9.2.	Scope .....	14
4.9.3.	Objective.....	15
4.9.4.	User requirements.....	15
4.10.	MSP 10 Maritime Assistance Service (MAS) [NORWAY] .....	15
4.10.1.	Definition .....	15
4.10.2.	Scope 15	
4.10.3.	Objective15	
4.10.4.	User requirements.....	15
4.11.	MSP 11 Nautical Chart Service [IHO] .....	15
4.11.1.	Definition .....	15
4.11.2.	Scope 16	
4.11.3.	Objective16	
4.11.4.	User requirements.....	16
4.12.	MSP 12 Nautical publications service [IHO] .....	16
4.12.1.	Scope 16	
4.12.2.	Objective16	
4.12.3.	User requirements.....	16
4.13.	MSP13 Ice navigation service [sweden] +CANADA .....	16
4.13.1.	Definition .....	16
4.13.2.	Scope 16	
4.13.3.	Objective17	
4.13.4.	User requirements.....	17
4.14.	MSP14 Meteorological information service [WMO]+NORWAY .....	17
4.14.1.	Definition .....	17



# CONTENTS

4.14.2. Scope	17
4.14.3. Objective	17
4.14.4. User requirements	17
<b>4.15. MSP15 Real-time hydrographic and environmental information services [IHO]</b>	<b>17</b>
4.15.1. Definition	17
4.15.2. Scope	18
4.15.3. Objective	18
4.15.4. User requirement	18
<b>4.16. MSP16 Search and Rescue (SAR) Service [NORWAY] +IMRF+sweden</b>	<b>18</b>
4.16.1. Definition	18
4.16.2. Scope	18
4.16.3. Objective	18
4.16.4. User requirements	18
<b>4.17. MSP17 Aids to Navigation services (AtoN) [IALA](arm)</b>	<b>18</b>
<b>4.18. MSP18 Communication services [IALA]</b>	<b>18</b>
<b>4.19. MSP19 PNT and augmentation services [UK GLA]</b>	<b>19</b>
<b>4.20. [MSP20 Anti-piracy information] [IMB]</b>	<b>19</b>
<b>5. ASSESSMENT OF SUITABLE SERVICES</b>	<b>19</b>
5.1. Services	19
<b>6. RELEVANT ASSOCIATED IMO GUIDELINES</b>	<b>19</b>
6.1. Guidelines on SQA and HCD	19
6.2. Guidelines on Display of navigation information from communications	19
6.3. Guidelines on test beds reporting	19
<b>7. LIST OF PUBLICATIONS THAT CAN BE DIGITAL</b>	<b>19</b>
<b>8. ACRONYMS To be checked</b>	<b>19</b>
<b>ANNEX A ANNEX</b>	<b>21</b>
APPENDIX 1 APPENDIX TITLE	22

## List of Tables

<i>Table 1</i>	<i>Responsible Authorities</i>	8
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## 1. INTRODUCTION

### 1.1. GENERAL DESCRIPTION

When developing the IMO e-Navigation strategy to improve safety and efficiency of sea transport it became clear that digital services provided to ships are an essential part of this initiative. In order to best describe, structure and implement those services, IMO introduced the concept of “Marine Service Portfolios” (MSPs).

A “Maritime Service Portfolio (MSP)” defines and describes the set of operational and technical services and their level of service provided by a stakeholder in a given sea area, waterways or ports, as appropriate. (NAV 57/6 para 23)

IMO has identified a preliminary list of 16 MSPs. Under its remit, IALA recognised that additional MSPs were needed for items such as AtoNs and PNT, which have been added to these guidelines.

### 1.2. PURPOSE

This guideline is mainly for providers of services defined in MSPs to understand what is expected by the maritime community if a dedicated provider of such services is declaring the availability of an MSP in their jurisdiction. It provides the basic information on the defined MSPs. It describes the objectives to be achieved with the MSP as well as a short explanation of the MSP. It also includes references to other MSPs, which may be associated to the specific MSP in question.

This guideline helps providers to integrate new digital services and to migrate from conventional to digital services but does not include technical specifications necessary for the implementation of those MSPs. Those will be defined elsewhere through the respective competent bodies, but are referenced in this document for easy access. It rather provides the guidance on the overarching expectations for a service provider of a given MSP.

The services described in this guideline are intended for IALA guidance, but can also be used for other organisations and authorities planning to implement a set of services as a portfolio.

### 1.3. IMPLEMENTATION

The services described within this guideline can be implemented in full or in part, based on individual service providers local circumstances

Add diagram here

## 2. GOVERNING BODY, SERVICE PROVIDERS & STAKEHOLDERS

### 2.1. DEFINITIONS

- **MSP governing body** which defines and maintains the overall architecture of the MSPs, endorses the definition and scope of individual MSPs, ensures interoperability and consistency, etc. (the IMO/IHO HGDM could be the initial basis for defining further that structure;

- **Service definition owner** which proposes the definition to the governing body and then implement the agreed definition through technical specifications

- **Service provider** responsible for delivering an operational service according to the relevant specifications;

- **User** which makes use of the information provided by the service. In some cases (i.e. MSI service), there may be a need to distinguish between the provider of the information content (i.e. a NAVAREA coordinator) and the provider of the communication infrastructure/service (i.e. SafetyNET).

- **Technical service specification owner** refers to the body responsible for developing and maintaining the technical specification(s) of a service, based on the corresponding service definitions [by way of example: for VTS Information Service, technical service specification owners could be the IALA ENAV Committee and the IHO]

## 2.2. RESPONSIBLE SERVICE PROVIDERS [TO BE DECIDED LATER]

In each country there will be authorities responsible for providing information services. The table in Annex A offers examples of authorities responsible in each case, which can be different between countries.

Responsible authorities may require service providers to deliver the operational service.

**Table 1 Responsible Authorities use table from NCSR1/9**

Service No	Identified Services	Example of Responsible Authorities
1	VTS Information Service (IS)	National Competent VTS Authority/Coastal or Port Authority
2	Navigational Assistance Service (NAS)	National Competent VTS Authority/Coastal or Port Authority
3	Traffic Organisation Service (TOS)	National Competent VTS Authority/Coastal or Port authority
4	Local port Service (LPS)	Local Port/Harbour Authority
5	Maritime Safety Information (MSI) Service	National Competent Authority
6	Pilotage service	Pilotage Authority/Pilot Organization
7	Tug Service	National Competent Authority; Local Port/Harbour Authority
8	Vessel Shore Reporting	National Competent Authority and appointed service providers
9	Telemedical Assistance Service (TMAS)	National health organization / dedicated health organization
10	Maritime Assistance Service (MAS)	Coastal/Port Authority / Organization
11	Nautical Chart Service	National Hydrographic Authority / Organization
12	Nautical Publications service	National Hydrographic Authority / Organization
13	Ice navigation Service	National Competent Authority Organization
14	Meteorological information service	National Meteorological Authority Public Institutions
15	Real time hydrographic and environmental information service	National Hydrographic and Meteorological Authorities
16	Search and Rescue Service	SAR Authorities

### 3. DEFINED SEA AREAS FOR INFORMATION SERVICES

The following six areas have been identified for the delivery of MSPs: (See NCSR 1/28 Annex 7)

- 1 port areas and approaches.
- 2 coastal waters and confined or restricted areas.
- 3 open sea and open areas.



- 4 areas with offshore and/or infrastructure developments.
- 5 Polar areas.
- 6 other remote areas.

## 4. MARITIME SERVICES

### 4.1. MSP 1 VTS INFORMATION SERVICE (IS)

#### 4.1.1. OBJECTIVES

The 'VTS IS' is defined by IMO as “a service to ensure that essential information becomes available in time for on-board navigational decision-making” (Res. A857(20)).

#### 4.1.2. DESCRIPTION OF SERVICE

IS is provided by broadcasting information at fixed times and intervals or when deemed necessary by the VTS or at the request of a vessel.

An Information Service involves maintaining a traffic image and allows interaction with traffic and response to developing traffic situations. An Information Service should provide essential and timely information to assist the onboard decision-making process, which may include but is not limited to:

- the position, identity, intention and destination of vessels;
- amendments and changes in promulgated information concerning the VTS area such as boundaries, procedures, radio frequencies, reporting points;
- the mandatory reporting of vessel traffic movements;
- meteorological and hydrological conditions, notices to mariners, status of aids to navigation;
- manoeuvrability limitations of vessels in the VTS area that may impose restrictions on the navigation of other vessels, or any other potential hindrances; or
- any information concerning the safe navigation of the vessel.

The VTS IS is designed to improve the safety and efficiency of vessel traffic and to protect the environment. Other such services include catalogue such as: Routing, Channel information, Security level, Berthing, Anchorage, Time slot, Traffic monitoring and assessment, Waterway conditions, Weather, Navigational hazards, any other factors that may influence the vessel's transit, Reports on the position, Identity and intentions of other traffic.

#### 4.1.3. AREA OF OPERATION

VTS area

#### 4.1.4. INFORMATION

Refer to the list of attributes

#### 4.1.5. REFERENCE TO TECHNICAL SERVICES, INCLUDING GUIDANCE FOR THE SERVICE PROVIDER ON HOW TO TECHNICALLY IMPLEMENT THE SERVICE

TBD

#### 4.1.6. RELATIONSHIP TO OTHER MSPs

See xx & xx

#### 4.1.7. EXAMPLES OF EXISTING SERVICES OR/AND TEST BEDS

Examples here:

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## 4.2. MSP 2 NAVIGATIONAL ASSISTANCE SERVICE (NAS)

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### 4.2.1. DEFINITION

The NAS is defined by IMO as “a service to assist on-board navigational decision-making and to monitor its effects” (IMO Res.A857(20)).

NAS may be provided on request by a vessel in circumstances such as equipment failure or navigational unfamiliarity. Specific examples of developing situations where NAS may be provided by the VTS include:

- Risk of grounding;
- Vessel deviating from the recommended track or sailing plan;
- Vessel unsure of its position or unable to determine its position;
- Vessel unsure of the route to its destination;
- Assistance to a vessel to an anchoring position;
- Vessel navigational or manoeuvring equipment casualty;
- Inclement conditions (e.g. low visibility, high winds);
- Potential collision between vessels;
- Potential collision with a fixed object or hazard;
- Assistance to a vessel to support the unexpected incapacity of a key member of the bridge team,
- At the request of the Master.

### 4.2.2. SCOPE

### 4.2.3. OBJECTIVE

### 4.2.4. USER REQUIREMENTS

All information related to this service should be displayed in real time.

Only information about dangerous ships nominated by the mariner should be displayed to prevent screen clutter.

When dangerous ships nominated by mariner do not keep their route in the case of route plan exchange, an alert should be emitted.

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## 4.3. MSP 3 TRAFFIC ORGANIZATION SERVICE (TOS)

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### 4.3.1. DEFINITION

The TOS is defined by IMO as “a service to prevent the development of dangerous maritime traffic situations and to provide for the safe and efficient movement of vessel traffic within the VTS area” (IMO Res.A857(20)).

The purpose of the TOS is to prevent hazardous situations from developing and to ensure safe and efficient navigation through the VTS area.

TOS should be provided when the VTS is authorized to provide services, such as when:

- vessel movements need to be planned or prioritized to prevent congestion or dangerous situations;
- special transports or vessels with hazardous or polluting cargo may affect the flow of other traffic and need to be organized;
- an operating system of traffic clearances or sailing plans, or both, has been established;
- the allocation of space needs to be organized;
- mandatory reporting of movements in the VTS area has been established;
- special routes should be followed;
- speed limits should be observed;
- the VTS observes a developing situation and deems it necessary to interact and coordinate vessel traffic;
- nautical activities (e.g. sailing regattas) or marine works in-progress (such as dredging or submarine cable-laying) may interfere with the flow of vessel movement.

#### **4.3.2. SCOPE**

#### **4.3.3. OBJECTIVE**

#### **4.3.4. USER REQUIREMENTS**

### **4.4. MSP 4 LOCAL PORT SERVICE (LPS)**

#### **4.4.1. DEFINITION**

LPS is applicable to those ports where it has been assessed that a VTS, as described above, is excessive or inappropriate.

The main difference arising from the provision of LPS is that it does not interact with traffic, nor is it required to have the ability and/or the resources to respond to developing traffic situations and there is no requirement for a vessel traffic image to be maintained.

Provision of LPS is designed to improve port safety and co-ordination of port services within the port community by dissemination of port information to vessels and berth or terminal operators. It is mainly concerned with the management of the port, by the supply of information on berth and port conditions. Provision of LPS can also act as a medium for liaison between vessels and allied services, as well as providing a basis for implementing port emergency plans. Examples of LPS may include:

- berthing information;
- availability of port services;
- shipping schedules;
- meteorological and hydrological data.

#### **4.4.2. SCOPE**

#### **4.4.3. OBJECTIVE**

#### 4.4.4. USER REQUIREMENTS

### 4.5. MSP 5 MARITIME SAFETY INFORMATION SERVICE (MSI)

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#### 4.5.1. DEFINITION

The Global Maritime Distress and Safety System (GMDSS) as described in SOLAS Chapter IV defines the seventh functional requirement as: 'Every ship, while at sea, shall be capable of transmitting and receiving maritime safety information'.

The MSI service is an internationally co-ordinated network of broadcasts of Maritime Safety Information from official information providers, such as:

- National Hydrographic Offices, for navigational warnings and chart correction data;
- National Meteorological Offices, for weather warnings and forecasts;
- Rescue Co-ordination Centres (RCCs), for shore-to-ship distress alerts;
- The International Ice Patrol, for Oceanic ice hazards. To be amended by IHO

#### 4.5.2. SCOPE

#### 4.5.3. OBJECTIVE

#### 4.5.4. USER REQUIREMENTS

### 4.6. MSP 6 PILOTAGE SERVICE [IMPA]

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#### 4.6.1. DEFINITION

The aim of the pilotage service is to safeguard traffic at sea and protect the environment by ensuring that vessels operating in pilotage area have navigators with adequate qualifications for safe navigation. Each pilotage area needs highly specialized experience and local knowledge on the part of the pilot.

Efficient pilotage depends, among other things, upon the effectiveness of the communications and information exchanges between the pilot, the master and the bridge personnel and upon the mutual understanding, each has for the functions and duties of the other.

Establishment of effective co-ordination between the pilot, the master and the bridge personnel, taking due account of the ship's systems and equipment available to the pilot, will aid a safe and expeditious passage.

#### 4.6.2. SCOPE

Contact info?

#### 4.6.3. OBJECTIVE

#### 4.6.4. USER REQUIREMENTS

### 4.7. MSP 7 TUGS SERVICE

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#### 4.7.1. DEFINITION

Efficient tug operations depend on, among other things, the effectiveness of the communications and information exchanges between relevant stakeholders. The aim of the tugs services is to safeguard traffic at sea and protect the environment by conducting operations such as:

- transportation (personnel and staff from port to anchorage) operations;
- ship assistance (ex: mooring) operations;
- salvage (grounded ships or structures) operations;
- shore operations;
- towage (harbour/ocean) operations;
- escort operations;
- oil spill response operations.

#### 4.7.2. SCOPE

#### 4.7.3. OBJECTIVE

#### 4.7.4. USER REQUIREMENTS

### 4.8. MSP 8 VESSEL SHORE REPORTING

#### 4.8.1. DEFINITION

The aim of vessel shore reporting is to safeguard traffic at sea, ensure personnel safety and security, ensure environmental protection and increase the efficiency of maritime operations.

Automated ship reporting is one of the most important solutions to reduce the Mariners workload (amount of time spent on preparing and submitting reports to shore-based authorities). To achieve this, reports should be automatically generated as much as possible from on-board systems. Some of the ways the administrative burden of vessel shore reporting can be reduced are:

- single-entry of reporting information into ICT collection tools that store it in a repository and ICT tools that assists with the generation all required reports from this repository;
- automated collection of information from ship-board systems that is required for reporting (for example Ballast Management System, Emissions Control System, Waste Management System, Navigation System, etc., etc.);
- ICT tools that allow mariners to delegate to shore-based personnel (at the discretion of the ship's owner/operator) the tasks of information collection, generation and submittal of required reports;
- reduce the administrative burden by encouraging all national reporting requirements to use standardized digital reporting formats based on the S-200 Product Specification of the Common Maritime Data Structure;
- automated or semi-automated digital distribution/communication of required reports via available networks.

#### 4.8.2. SCOPE

Submission and distribution of all reports required by all shore-based authorities in the required format and in the required timeframe.

#### 4.8.3. OBJECTIVE

Reduce the burden of submittal and distribution of required reports

#### 4.8.4. USER REQUIREMENTS

Provide ICT tools for shipboard and shore-based personnel to streamline the processes and procedures associated with submittal, generation and distribution of required reports, including retrieval of information from other ship systems (Ballast Management, Waste Management System, Emission Control System, Navigation System, etc., etc.) and from shore-based sources (cargo and passenger booking offices, crewing agents, stevedores, etc., etc.).

Such tools should alert the user what information is missing in the repository that prevents generation of the required reports for an upcoming port call, which reports will need to be submitted when, to whom in what format and via which communications network.

The repository structure shall comply with the latest version of the S-200 Product Specification for the Common Maritime Data Structure.

The reports shall fulfil the exact requirements of each and every shore-based authority. This means adhering to the requirements for report format (hard copy, fax, MS Word, PDF, RTF, XML, Excel, CSV, etc.), its graphical layout, its language(s), the specification of its fields, its units of measure, allowed abbreviations, its deadline (relative to the arrival at the next port), how it is authenticated, how it is to be submitted, who it should be addressed to, etc., etc.

The reports should be created in the proper time and time period to report before her arrival at ports or sea area automatically and authorised by master before submission.

The information related to ship operation should not be revised intentionally by mariner and should be collected directly from ship's automatic monitoring system.

To fulfil the above user requirements an eco-system shall be established in which developers of such ICT Tools can thrive and provide shipping lines with a number of alternative solutions.

This, in turn, requires building and maintaining a library of required reports that are uniquely identified and characterized by their requirements for format, deadline, content, etc., etc. (FONASBA, which is an association of shipping agents that has 'Observer' status at IMO may be enticed to build and maintain the report library). The eco-system also requires developing and maintaining an S-200 Product Specification for CMDS that can be used to generate all required reports in the library. Lastly it requires that ships' systems that generate reporting information be certified to be compliant with an international machine-to-machine interface standard or ship network standards such as IEC 61162 series. A prime candidate for such standards are those developed by the Open Connectivity Foundation for the Internet of Things (IoT).

### 4.9. MSP 9 TELEMEDICAL ASSISTANCE SERVICE (TMAS)

#### 4.9.1. DEFINITION

According to the IMO/ILO resolution 164 the TMAS centre should provide medical advice for seafarers 24 h/day, 365 days/year. TMAS should be permanently staffed by physicians qualified in conducting remote consultations and who are well versed in the particular nature of treatment onboard ship.

Within the maritime medicine the prevailing view has for a long time been that a standardization of the TMAS services is both necessary and wanted. This would firstly enhance the quality of the medical practice, and secondly, a standardization of reporting and registering of medical events will make a much better basis for advancement. MSC.1/Circ.1218 MSC/Circ.960

#### 4.9.2. SCOPE

#### 4.9.3. OBJECTIVE

#### 4.9.4. USER REQUIREMENTS

### 4.10. MSP 10 MARITIME ASSISTANCE SERVICE (MAS)

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#### 4.10.1. DEFINITION

The primary mission of MAS is to handle communication between the coastal State, ship's officers requiring assistance, and other players in maritime community. These can be fleet owners, salvage companies, port authorities, brokers, etc.

The MAS is on 24-hour alert to deploy rapid assistance and professional support for ships in connection with: Combating pollution, fire and explosions on board, collision, grounding, maritime security, terror mitigation, etc.

The Ship Security Alert System enables a vessel to send a distress call if it is attacked by pirates, etc. On receiving such a call, the MAS is responsible for alerting the relevant authorities responsible for a response.

The MAS is responsible only for receiving and transmitting communications and monitoring the situation. It serves as a point of contact between the master and the coastal State concerned if the ship's situation requires exchanges of information between the ship and the coastal State.

Situations where the MAS apply are as follow:

- A ship involve in an incident (loss of cargo, accidental discharge of oil, etc.) that does impair its seakeeping ability but nevertheless has to be reported;
- a ship in need of assistance according to the master's assessment, but not in distress situation that requires the rescue of personnel on board;
- a ship in distress when those on board have already been rescued, with the possible exception of those who have remained aboard or have been placed on board to attempt to deal with the ship's situation.

The MAS entails the implementation of procedures and instructions enabling the forwarding of any given information to the competent organization and requiring the organizations concerned to go through the MAS in order to make contact with the ship.

#### 4.10.2. SCOPE

#### 4.10.3. OBJECTIVE

#### 4.10.4. USER REQUIREMENTS

### 4.11. MSP 11 NAUTICAL CHART SERVICE [IHO]

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#### 4.11.1. DEFINITION

The aim of the nautical chart service is to safeguard navigation at sea by providing information such as nature and form of the coast, water depth, tides table, obstructions and other dangers to navigation, location and type of aids to navigation.

The Nautical Chart service also ensure the distribution, update and licensing of electronic chart to vessels and other maritime parties. IHO to supply text

#### 4.11.2. SCOPE

#### 4.11.3. OBJECTIVE

#### 4.11.4. USER REQUIREMENTS

### 4.12. MSP 12 NAUTICAL PUBLICATIONS SERVICE [IHO]

#### 4.12.1 Definition

The aim of the nautical publication service is to promote navigation awareness and safe navigation of ships. The nature of waterways described by any given nautical publication changes regularly, and a mariner navigating by use of an old or uncorrected publication is courting disaster. Nautical publications include:

Tidal currents, aids to navigation system, buoys and fog signals, radio aids to marine navigation, chart symbols, terms and abbreviations, sailing directions.

A Chart and Publication Correction Record Card system can be used to ensure that every publication is properly corrected prior use by mariners. IHO to provide text

#### 4.12.1. SCOPE

#### 4.12.2. OBJECTIVE

#### 4.12.3. USER REQUIREMENTS

### 4.13. MSP13 ICE NAVIGATION SERVICE

#### 4.13.1. DEFINITION

The ice navigation service is critical to safeguard the ship navigation in ice-conditions, given how quickly the ice maps become outdated in the rapid changing conditions of the ice-covered navigational regions. Such services include:

- ice condition information and operational recommendations/advice;
- ice condition around a vessel;
- vessel routing;
- vessel escort and ice breaking;
- ice drift load and momentum;
- ice patrol.

#### 4.13.2. SCOPE



#### 4.13.3. OBJECTIVE

#### 4.13.4. USER REQUIREMENTS

### 4.14. MSP14 METEOROLOGICAL INFORMATION SERVICE [WMO]

#### 4.14.1. DEFINITION

The meteorological service is essential to safeguard the traffic at sea by providing real-time weather conditions, forecasts, warnings, and weather routing to mariners who will use these types of information to support their decision-making.

The meteorological service is essential to safeguard the traffic at sea by providing weather, climate digital forecasts and related information to mariners who will use these types of information to support their decision making. Such information includes:

- weather routing, solar radiation, precipitation;
- cold/hot periods, warnings;
- air temperature, wind speed & direction;
- cloud cover, barometric pressure.

#### 4.14.2. SCOPE

#### 4.14.3. OBJECTIVE

#### 4.14.4. USER REQUIREMENTS

### 4.15. MSP15 REAL-TIME HYDROGRAPHIC AND ENVIRONMENTAL INFORMATION SERVICES [IHO]

#### 4.15.1. DEFINITION

The real time and forecast hydrographic and environmental information services are essential to safeguard navigation at sea and protect the environment.

The real time hydrographic and environmental information service is essential to safeguard navigation at sea and protect the environment. The service provided include:

- current speed and direction;
- wave height;
- marine habitat and bathymetry;
- Sailing Directions (or pilots): detailed descriptions of areas of the sea, shipping routes, harbours, aids to navigation, regulations, etc.;
- Lists of lights: descriptions of lighthouses and lightbouts;
- tide surge prediction tables and tidal stream atlases;

- ephemerides and nautical almanacs for celestial navigation;
- Notice to Mariners: periodical (often weekly) updates and corrections for nautical charts and publications.

IHO to provide text

#### 4.15.2. SCOPE

#### 4.15.3. OBJECTIVE

#### 4.15.4. USER REQUIREMENT

### 4.16. MSP16 SEARCH AND RESCUE (SAR) SERVICE

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#### 4.16.1. DEFINITION

The SAR service is responsible for assisting, coordinating search and rescue operations at sea. In maintaining a state of full readiness, the Services may assist the following search and rescue functions:

- The crew and passengers of vessels in distress;
- Victims of maritime and aircraft accidents or incidents.

The SAR services must also coordinate the evacuation of seriously injured or ill person from a vessel at sea when the person requires medical treatment sooner than the vessel would be able to get him or her to a suitable medical facility.

The Services may also be pro-actively involved in activities such as:

- Information collection, distribution, and coordination;
- Monitoring towing operations;
- Monitors and evaluates levels of risk from Maritime Safety Information (MSI) broadcasts to ensure an immediate response in case of life threatening situations developing;
- Monitoring vessels not under command;
- Pollution reports and vessels aground.

#### 4.16.2. SCOPE

#### 4.16.3. OBJECTIVE

#### 4.16.4. USER REQUIREMENTS

### 4.17. MSP17 AIDS TO NAVIGATION SERVICES (ATON) [IALA]

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### 4.18. MSP18 COMMUNICATION SERVICES [IALA]

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#### **4.19. MSP19 PNT AND AUGMENTATION SERVICES**

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#### **4.20. [MSP20 ANTI-PIRACY INFORMATION]**

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### **5. ASSESSMENT OF SUITABLE SERVICES**

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#### **5.1. SERVICES**

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### **6. RELEVANT ASSOCIATED IMO GUIDELINES**

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#### **6.1. GUIDELINES ON SQA AND HCD**

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#### **6.2. GUIDELINES ON DISPLAY OF NAVIGATION INFORMATION FROM COMMUNICATIONS**

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#### **6.3. GUIDELINES ON TEST BEDS REPORTING**

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### **7. LIST OF PUBLICATIONS THAT CAN BE DIGITAL**

### **8. ACRONYMS TO BE CHECKED**

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AtoN	Aid(s) to Navigation
Circ.	Circular (IMO)
CMDS	Common Maritime Data Structure
COMSAR	Former Sub Committee on Communications and Search and Rescue (IMO)
CSV	Comma Separated Variable(s)
fax	Facsimile
FONSABA	Federation of National Associations of Ship Brokers and Agents
GMDSS	Global Maritime Distress and Safety System
HCD	Human Centred Design
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
ICT	Information and Communications Technology
IEC	International Electrotechnical Commission
ILO	International Labour Organization (UN)
IoT	Internet of Things
IS	Information Service, as part of Vessel Traffic Services
IMO	International Maritime Organization (UN)



LPS	Local Port Service(s)
MAS	Maritime Assistance Service
MSC	Maritime Safety Committee (IMO)
MSIS	Maritime Safety Information Service
MSP	Maritime Service Portfolio(s)
NAS	Navigational Assistance Service, as part of Vessel Traffic Services
NAV	Former Sub Committee on Safety of Navigation(IMO)
NCSR	Sub Committee on Navigation, Communications and Search and Rescue (formerly COMSAR and NAV) (IMO)
PDF	Portable Document Format
PNT	Position, Navigation and Timing
RCC	Rescue Co-ordination Centre(s)
Res.	Resolution
RTF	Rich Text Format
SAR	Search and Rescue
SIP	IMO e-Navigation Strategy Implementation Plan (NCSR1/28, Annex 7; as adopted by MSC94, Nov. 2014)
SOLAS	International Convention for the Safety of Life at Sea, 1974 (as amended)
SQA	Software Quality Assurance
S-100	Universal Hydrographic data model (IHO)
S-200	IALA domain for S-100 Product Specifications
TMAS	Telemedical Assistance Service
TOS	Traffic Organisation Service, as part of Vessel Traffic Services
VTs	Vessel Traffic Service(s)
XML	eXtensible Markup Language

## ANNEX A   ANNEX

Guidelines should have lettered Annexes. Numbered Appendices are attached to Annexes.

ANNEXES B onward 'number' automatically. Each has its own heading styles in the style pane.

### **A 1.   ANNEX A HEAD1**

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#### **A 1.1.   ANNEX A HEADING 2**

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#### **A 1.2.   ANNEX A HEADING 3**

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##### **A 1.2.1.1   Annex A Heading 4**

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## APPENDIX 1   APPENDIX TITLE

### 1.   APPENDIX 1 HEADING 1

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#### 1.1.   APPENDIX HEADING 2

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##### 1.1.1.   APPENDIX HEADING 3

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##### 1.1.1.1.   Appendix heading 4

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IALA working paper