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| IALA Guideline |

Maritime Service Portfolios:
digitising maritime services

Edition 1.0

Document date

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

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# INTRODUCTION

## 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.

## 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.

## Implementation

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

### Change process

The transformation of existing services into digital services needs to follow a defined process to be successful. See Figure below:

In the beginning there needs to be an assessment of the current situation as well as a clear definition of the intended future situation. This assessment includes review of the organization, the processes and the outputs of the two states: Current and Future.

The result of this assessment will be the input to further analysis. During the analysis phase all relevant information need to be taken into consideration. The categories of information to be analysed are technical and procedural information as well as existing experience and guidelines. The analysis phase will document all information classes of relevant and the expected outcomes in accordance with the initial assessment of the intended end state. Both a Change Process Plan as well as a Change Process Timeline will have to be created. Once those two plans are available, the execution can start in accordance to those plans.



# Governing body, SERVICE PROVIDERS & STAKEHOLDERS

## 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]

##  [*all above agreed enav 20 with IHO comments*]Responsible service providers [to be decided later]

In each country there will be authorities responsible for providing information services. The table below 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.

1. Responsible Authorities (use table derived from NCSR1/28, annex 7?)

| Service No | Identified Services | Identified Responsible Service Provider |
| --- | --- | --- |
| 1 | VTS Information Service (INS) | VTS Authority |
| 2 | Navigational Assistance Service (NAS) | VTS Authority |
| 3 | Traffic Organisation Service (TOS) | VTS 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 |

# Defined sea areas for MSP's

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.

# MARITIME SERVICES

## MSP1 VTS Information Service (INS) (from VTS ctte) Singapore+ CANADA +NL

### Definition

Information Service 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)).

### Scope

MSP1 can be delivered in all sea areas (1-6).

### Objective

IALA guideline 1089 gives guidance on the delivery of the three different types of services provided by a VTS; Information Service (INS), Traffic Organization Service (TOS) and Navigational Assistance Service (NAS).

MSP1 is defining the categories of information that could be exchanged electronically in respect of Information Services (INS).

The categories of services and the associated details are listed in annex 1, MSP1 Information Service template.

Those categories may include for example: Waterway information, Traffic and route information.

Information Service may also utilise categories which are defined in other MSP's (see 4.1.5).

### User requirements

Information provided electronically could complement and/or replace VHF communication.

For example:

* Pre arrival reporting can be done electronically without VHF communication
* The content of the VHF communication can be transmitted electronically and be displayed as a text in parallel to voice communication.

### Relationship to other MSPs

* MSP5, Maritime Information Service
* MSP6, Pilotage Service
* MSP7, Tugs Service
* MSP8, Vessel Shore Reporting
* MSP10, Maritime Assistance Service
* MSP13, Ice Navigation Service
* MSP14, Meteorological Information Service
* MSP15, Real-time Hydrographic and Environmental Information Service
* MSP16, Search and Rescue Service

## MSP2 Navigational Assistance Service (NAS) (from VTS COMMITTEE)+singapore+CANADA+NL

### Definition

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

### Scope

MSP2 can be delivered in sea areas 1-4.

### Objective

IALA guideline 1089 gives guidance on the delivery of the three different types of services provided by a VTS; Information Service (INS), Traffic Organization Service (TOS) and Navigational Assistance Service (NAS).

MSP2 is defining the categories of information that could be exchanged electronically in respect of Navigational Assistance Service (NAS).

The categories of services and the associated details are listed in annex 2, MSP2 Navigational Assistance Service template.

Those categories may include for example: Navigational information, advice, instruction or warning.

### User requirements

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

Information provided electronically could complement VHF communication in time critical situations and in addition partly replace VHF communication in non-time critical situations.

Example of time critical situation:

* Risk of grounding; In addition to VHF communication, vessel can be provided with an electronic route recommendation.

Example of non-time critical situation:

* Assist a vessel to an anchoring position; provide the vessel with an electronic route recommendation without VHF communication.

## MSP3 Traffic Organization Service (TOS) (from VTS COMMITTEE) +SINGAPORE+ Canada+NL

### Definition

Traffic Organization Service 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)).

### Scope

MSP3 can be delivered in sea areas 1-4.

### Objective

IALA guideline 1089 gives guidance on the delivery of the three different types of services provided by a VTS; Information Service (INS), Traffic Organization Service (TOS) and Navigational Assistance Service (NAS).

MSP3 is defining the categories of information that could be exchanged electronically in respect of Traffic Organization Service (TOS)

The categories of services and the associated details are listed in annex 3, MSP3 Traffic Organization Service template.

Those categories may include for example: Waterway management, Traffic clearance.

### User requirements

Information provided electronically could complement and/or replace VHF communication.

Examples:

* Slot management; provide vessels electronically with timestamp, priority of arrival and distance between two vessels
* Traffic clearance; provide vessels permission to proceed, impose conditions or deny entry electronically

## MSP4 Local Port Service (LPS) [M BErgmann]+s KOREA+Sweden+singapore+IHMA

### 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.

### Scope

### Objective

### User requirements

## MSP5 Maritime Safety Information service (MSI) [IHO]+NORWAY+CHRISTENSEN+CANADA+KRISO

### 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

### Scope

### Objective

### User requirements

## MSp6 Pilotage service [IMPA]

### 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.

### Scope

Contact info?

### Objective

### User requirements

## MSP7 Tugs service [None -however port CDM project might help]

### 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.

### Scope

### Objective

### User requirements

## MSP8 Vessel shore reporting [s Korea+norway+italy+sweden+SINGAPORE+CIRM]

### 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.

### Scope

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

### Objective

Reduce the burden of submittal and distribution of required reports

### 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, it’s 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).

## MSP9 Telemedical Assistance Service (TMAS) [NORWAY]+NTnu

### 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

### Scope

### Objective

### User requirements

## MSP10 Maritime Assistance Service (MAS) [NORWAY]

### 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.

### Scope

### Objective

### User requirements

## MSP11 Nautical Chart Service [IHO]

### 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

### Scope

### Objective

### User requirements

## MSP12 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

### Scope

### Objective

### User requirements

## MSP13 Ice navigation service [sweden] +CANADA

### 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.

### Scope

### Objective

### User requirements

## MSP14 Meteorological information service [WMO]+NORWAY

### Definition

The meteorological service is essential to safeguard the traffic at sea by providing real-time weather conditions, forecasts, warnings, and weather routeing 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.

### Scope

### Objective

### User requirements

## MSP15 Real-time hydrographic and environmental information services[IHO]

### 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 lightbouys;
* 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

### Scope

### Objective

### User requirement

## MSP16 Search and Rescue (SAR) Service [NORWAY] +IMRF+sweden

### 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.

### Scope

### Objective

### User requirements

## MSP17 Aids to Navigation services (AtoN) [IALA](arm)

## MSP18 Communication services [IALA]

## MSP19 PNT and augmentation services [UK GLA]

## [MSP20 Anti-piracy information] [IMB]

# ASSESSMENT OF SUITABLE SERVICES

## Services

# RELEVANT ASSOCIATED IMO GUIDELINES

## Guidelines on SQA and HCD

## Guidelines on Display of navigation information from communications

## Guidelines on test beds reporting

# LIST OF PUBLICATIONS THAT CAN BE DIGITAL

# ACRONYMS To be checked

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

1. 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.

1. ANNEX A HEAD1

Body Text

* 1. Annex A Heading 2

Body text

* 1. Annex A Heading 3

Body Text

* + - 1. Annex A Heading 4

Body Text

1. APPENDIX TITLE
2. APPENDIX 1 HEADING 1

Body Text

* 1. Appendix Heading 2

Body Text

* + 1. Appendix Heading 3

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* + - 1. Appendix heading 4

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