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| IMO/IHO HARMONIZATION GROUP ON DATA MODELLING  Agenda item X |  | HGDM 2/x/x  29 October 2018  ENGLISH ONLY |

**DEVELOPMENT OF GUIDANCE ON THE DEFINITION AND HARMONIZATION OF THE**

**FORMAT AND STRUCTURE OF MSPs**

**Draft Descriptions developed by the World Meteorological Organization (WMO), International Hydrographic Organization (IHO), and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)**

**Submitted by WMO, IHO, and IALA**

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| --- | --- |
| **SUMMARY** | |
| ***Executive summary:*** |  |
| ***Action to be taken:*** | Paragraph X |
| ***Related documents:*** | XXXXXXXXX |

# INTRODUCTION

# DISCUSSION

# ACTION REQUESTED OF THE HGDM

**ANNEX 1**

**MARITIME SERVICES DESCRIPTIONS**

1. **Draft MS 1 VTS Information Service (INS)**

## 1.1 Submitting Organisation

IALA

## 1.2 Description of the maritime service

IALA Guideline 1089 on Provision of Vessel Traffic Services (INS, TOS, NAS) 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).

An information service provided by a VTS is defined by IMO as “a service to ensure that essential information becomes available in time for on-board navigational decision-making.”

“The *information service* is provided by broadcasting information at fixed times and intervals or when deemed necessary by the VTS or at the request of a vessel, and may include for example reports on the position, identity and intentions of other traffic, waterway conditions, weather, hazards, or any other factors that may influence the vessel's transit.” (IMO Res A.857(20))

1. Examples of the types of information that may be provided by the VTS operating an Information Service (IALA Guideline 1089)

| Information related to: | Examples: |
| --- | --- |
| Navigational situations (including traffic and route information) | * Position, identity, destination of vessels and the intention of other traffic * Amendments and changes in promulgated information concerning the VTS area such as boundaries, procedures, radio frequencies, reporting points, the mandatory reporting of movements * Limited maneuverability that may impose restrictions on the navigation of other vessels, or any other potential hindrances * Suspension or change of routes, etc. |
| Navigational warnings | * Dangerous wrecks, obstacles not otherwise promulgated, diving operations, vessels not under command, etc. |
| Meteorology | * Information that will include the speed and direction of the prevailing wind, direction and height of the waves, visibility, atmospheric pressure, the formation of ice, etc. |
| Meteorological warnings | * Gale, storm, tsunami, restricted visibility, etc. |
| Hydrography | * Information that will include factors such as the stability of the seabed, sea depth, the accuracy of surveys, tidal ranges, tidal streams, prevailing currents and swell, etc. |
| Electronic navigational aids | * The availability of electronic navigational aids such as: GNSS, Loran, DGPS, AIS, RACON, etc. |
| Other information | * Port information, pilot or tug request, cargo information, health condition, PSC, ISPS, etc. |

## 1.3 Purpose

The purpose of MS 1 is to provide data in a digital format to support VTS Information Service (INS) and to create the means to reduce administrative burden and information overload, reduce miscommunication due to external interference, simplify work procedures, promote sustainable shipping, and increase navigational safety.

Information provided in a digital format could complement and/or replace verbal/voice communication. The steps to achieve this transition to digital information exchange may vary in different areas and for different types of vessels. Details about digital information exchange should be published by the VTS authority.

## 1.4 Operational approach

The digitalisation of information will diversify the communication means between shore authorities and vessels and will affect VTS procedures regarding information provision.

Not all vessels are capable of receiving information in digital format; provisions should therefore be made to ensure that less capable vessels are receiving the information they require. VTS should remain the primary contact with vessels for urgent and important messages, and will ensure communications with mariners.

## 1.5 User needs

IMO resolution A.857(20) contains examples of information that can be provided to vessels.

The use case below is based on the information from table 1.

## 1.5.1 Use Case - Vessel Arrival

[Before or upon arrival in the VTS area, a data collection system on board sends all details regarding the arrival via relevant infrastructure to the VTS. The VTS collects the vessel’s data directly into its system, and automatically updates the vessel’s pre-registered data. Both vessel and VTS use chart systems as a graphic interface to present details that are of interest to the voyage.

The example is generic and intended for description purposes only. Actions and template categories may differ for different countries. Information exchange can be in real time instead of at specific times as indicated in the table. *Content in the column named “Template Info (technical)” is pending submissions from relevant stakeholders.*

The categories of services and the associated details are listed in Appendix 1, MS1 Information Service template.]

| Time | Automated Vessel Action | Automated VTS Action | Info category in appendix |
| --- | --- | --- | --- |
| 01:00 | Provides pre-arrival info | Replying with information on weather | Environmental |
| 02:00 | Enters VTS Area, provides sailing route | Traffic information to vessel | Traffic and Route information |
| 02:30 | Passes reporting point line | Provides information on current, wave height, etc. | Hydrographical information |
| 03:00 | Requires port information | Provides quay details | Traffic and Route information |
| 03:30 | Passes second reporting point | Provides operational information on AtoNs | Navigation Hazards |
| 04:00 | Vessel along side | Gives information on wind speeds, visibility | Environmental |

## 1.6 information to be provided

See Appendix 1, MS 1 Information Service template

## 1.7 Associated technical services

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | ID (MRN) | Description | Architect(s) | Standardisation Body |
| Voyage Information Service | urn:mrn:stm:service:specification:sma:vis | The service supports exchange of voyage plans, text messages and area messages. |  | IEC |
| Weather Service |  |  |  |  |
| ENSI Voyage Reporting Service | urn:mrn:mcp:service:specification:fta:ENSI-VRS | The Service provides route validation for ships and facilitate sharing of SRS reports and Voyage information to shore centres. |  |  |
| Routing information | urn:mrn:iho | S-127 |  | IHO |
| Currents Service | urn:mrn:iho | S-101 |  | IHO |
| Wave height service |  |  |  |  |
| Port information (harbour charting information) | urn:mrn:iho | S-101 |  | IHO |
| Port information (harbour services information) |  |  |  | IHMA |
| AtoN Information | urn:mrn:iala |  |  | IALA |

*[To be filled later*

*NOTE!* Appendix *1 could be complimented with required information regarding this table]*

## 1.8 Relationship to other MSs

MS 1 has a relationship with other MSs where it affects the VTS:

Examples may be different depending on the coastal state arrangements.

|  |  |
| --- | --- |
| **Description** | **Examples of data that could be of interest for MS 1** |
| MS 1 VTS INS | See Appendix 1, MS 1, Information Service Template |
| MS 2 VTS NAS | See Appendix 2, MS 2, Navigation Assistance Service Template |
| MS 3 VTS TOS | See Appendix 3, MS 3, Traffic Organisation Service Template |
| MS 4 Local Port Service | Delays, obstruction, cargo operations, port availability and anchorage area in the port, ISPS state, Marsec level |
| MS 5 Maritime Safety Information | All information depending on structure of MSI |
| MS 6 Pilotage Service | Pilot orders and updates |
| MS 7 Tug Service | Tug order and updates |
| MS 8 Vessel Shore Reporting | Notification of arrival, dangerous cargo etc. |
| MS 9 Telemedical | Delays |
| MS 10 Maritime Assistance Service | Notifications, routing, places of refuge |
| MS 11 Nautical Chart Service | Local Area updates, chart updates |
| MS 12 Nautical Publication Service | Updates to publication |
| MS 13 Ice Navigation Service | Ice routes, ice conditions, ice breaking assistance |
| MS 14 Meteorological Service | Weather information |
| MS 15 Real Time Hydro and Inf Service | Horizontal and vertical Tidal information in VTS area, available water column |
| MS 16 Search and Rescue service | Search pattern and vessel of opportunity |

1. **Draft MS 2 VTS Navigational Assistance Service (NAS)**

## 2.1 Submitting Organisation

IALA

## 2.2 Description of the maritime service

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).

Navigational Assistance Service operated by VTS is defined by IMO as “a service to assist on-board navigational decision-making and to monitor its effects.”

“The *navigational assistance service* is especially important in difficult navigational or meteorological circumstances or in case of defects or deficiencies. This service is normally rendered at the request of a vessel or by the VTS when deemed necessary.” (IMO Res.A857(20))

1. Examples of the types of information that may be provided by a VTS operating a Navigational Assistance Service (IALA Guideline 1089)

|  |  |
| --- | --- |
| **Information related to NAS** | **Examples** |
| Request and identification | * availability of NAS, start and end of NAS; * request for vessel identification such as position, course made good and speed over the ground; * status of vessel's equipment; etc. |
| Navigational information  (including position and course  information) | * Examples provided to an individual vessel: * provide range and bearing from fixed objects, fairway/channel or way‐points; proximity to navigational hazards, etc. * provide information related to navigating into a channel/fairway/lane (i.e. track is parallel/diverging/converging with/from/to reference line); etc. |
| Advice (or instruction) | * advise (or instruct) a vessel to alter the course, speed; * advise (or instruct) to keep clear from area/position, close up/drop back on/from vessels; etc. |
| Warning | Diverging from the recommended track towards dangerous wrecks, obstacles not otherwise promulgated; diving operations; vessels not under command; etc. |

## 2.3 Purpose

The purpose of MS 2 is to provide information related to Navigational Assistance Service (NAS) in a digital format to create means to reduce administrative burden and information overload, reduce the risk for miscommunication due to external interference, simplify work procedures, promote sustainable shipping, and increase navigational safety.

Information provided in a digital format could complement and/or replace verbal/voice communication. The steps to achieve this transition to digital information exchange may vary in different areas and for different types of vessels. Details about digital information exchange should be published by the VTS authority.

## 2.4 Operational approach

All information related to MS 2 Navigational Assistance Service should be delivered only by VTS authorities.

VTS should remain the primary contact with vessels for urgent and important messages necessary for the on board decision making.

Information provided digitally could complement voice communications in time critical situations and in addition partly replace voice communications in non-time critical situations.

Note: Example of time critical situation:

* Risk of grounding/striking/collision. In addition to voice communications, the vessel can be provided with an electronic route recommendation.

Note: Example of non-time critical situation:

* Assist a vessel to an anchoring position by providing the vessel with an electronic route recommendation without voice communications.

The identity of the vessel receiving Navigational Assistance Service should be assured. Other items listed in the IALA Guideline 1089 On Provision of Vessel Traffic Service (Appendix B) should also be taken into consideration for digital transmission of information.

All information related to this service should be displayed in real time. Measures should be taken to ensure that the information is received and acknowledged.

## 2.5 User needs

The use case below are based on the information from table 2.

The use cases are generic and intended for description purposes only. Actions and template categories may differ for different countries. *Content in the column named “Template Info (technical)” is pending submissions from relevant stakeholders.*

For example:

* Recommended route can be send digitally to vessel
* Pre-arrival reporting can be done digitally without voice communication for update of route of voyage plan in order to avoid collisions, groundings and strikings and assist in safe navigation.
* The content of the voice communication can be provided digitally and be displayed as text in parallel / in addition to voice communication.

## 2.5.1 Use Case Vessel deviates from planned route

[Vessel approaches VTS area according to voyage plan sent to VTS. The route is displayed in the VTS application and vessels position is automatically compared to the planned route. The system alerts the VTS operator, who then confirms that the vessel has deviated from its route. The VTS operator informs, warns and if necessary instructs / advises the vessel to change course via voice communication. Navigational assistance information is also presented on the vessel’s own navigation system. The VTS operator ensures that the vessel has changed course according to the solution. The VTS application continues to monitor the vessel’s voyage. It will alert the VTS operator if new deviation occurs.

The categories of services and the associated details are listed in Appendix 2, MS2 Navigational Assistance Service template.

The example is generic and intended for description purposes only. Actions and template categories may differ for different countries. *Content in the column named “Template Info (technical)” is pending submissions from relevant stakeholders.* ]

| Time | Vessel Action | VTS Action | Info category in appendix |
| --- | --- | --- | --- |
| 01:00 | Approaches VTS area | Receive voyage plan and monitor vessels progress | Traffic and Route Information |
| 01:30 | Deviates from her route | Informs, warns and advises / instructs the vessel to change course/speed | Navigational advice |
| 01:35 | Changes course | Verifies that vessel has changed course and is no longer in danger |  |

## 2.5.2 Use Case – assistance to a vessel to an anchoring position

[Vessel is inside VTS area and needs to stop for engine repair. Vessel asks for a safe anchorage position. VTS provides anchoring position. Vessel takes direct course to the anchoring position, over a shallow area. VTS gives warning to the vessel and provides a safe route to anchorage position.

After the vessel has anchored, high winds develop causing the vessel to drag anchor. The VTS operator monitoring the anchorage receives an alarm and warns the vessel through automated digital alert and through voice communication.]

| Time | Vessel Action | VTS Action | Info category in appendix |
| --- | --- | --- | --- |
| 00:00 | Ask for anchorage position | Provides position | Navigation Information |
| 00:10 | Takes course to the position | Warning: You are running into danger - shallow waters...  Provides vessel safe route | Navigational warning / Advice |
| 00:20 | Follows route provided by VTS to the anchorage | Monitors | Navigational Information |
| 05:00 | Drags anchor | Warning: You are dragging anchor | Navigational warning |
| 05:30 | Repositions | Monitors | Navigational Information |

## 2.6 information to be provided

[See Appendix 2, MS 2 Navigational Assistance Service template]

## 2.7 Associated technical services

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | ID (MRN) | Description | Architect(s) | Standardisation Body |
| Voyage Information Service | urn:mrn:stm:service:specification:sma:vis | The service supports exchange of voyage plans, text messages and area messages. |  | IEC |
| Route information |  | S-421 |  | IEC |

## 2.8 Relationship to other MSs

MS 2 has a relationship to other MSs where it affects VTS:

Examples may be different depending on the coastal state arrangements.

|  |  |
| --- | --- |
| **Description** | **Examples of data that could be of interest for MS 2** |
| MS 1 VTS INS | See Appendix 1, MS 1, Information Service Template |
| MS 2 VTS NAS | See Appendix 2, MS 2, Navigation Assistance Service Template |
| MS 3 VTS TOS | See Appendix 3, MS 3, Traffic Organisation Service Template |
| MS 4 Local Port Service | Delays, obstruction, cargo operations, port availability and anchorage area in the port, ISPS state, Marsec level |
| MS 5 Maritime Safety Information | All information depending on structure of MSI |
| MS 6 Pilotage Service | Pilot orders and updates |
| MS 7 Tug Service | Tug order and updates |
| MS 8 Vessel Shore Reporting | Notification of arrival, dangerous cargo etc. |
| MS 9 Telemedical | Delays |
| MS 10 Maritime Assistance Service | Notifications, routing, places of refuge |
| MS 11 Nautical Chart Service | Local Area updates, chart updates |
| MS 12 Nautical Publication Service | Updates to publication |
| MS 13 Ice Navigation Service | Ice routes, ice conditions, ice breaking assistance |
| MS 14 Meteorological Service | Weather information |
| MS 15 Real Time Hydro and Information Service | Horizontal and vertical tidal information in VTS area, available water column |
| MS 16 Search and Rescue service | Search pattern and vessels of opportunity |

1. **Draft MS 3 Traffic Organization Service (TOS)**

## 3.1 Submitting Organisation

IALA

## 3.2 Description of the maritime service

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).

Traffic Organization Service operated by VTS 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.”

“The *traffic organization service* concerns the operational management of traffic and the forward planning of vessels movements to prevent congestion and dangerous situations, and is particularly relevant in times of high traffic density or when the movement of special transports may affect the flow of other traffic. The service may also include establishing and operating a system of traffic clearances or VTS sailing plans or both in relation to priority of movements, allocation of space, mandatory reporting of movements in the VTS area, routes to be followed, speed limits to be observed or other appropriate measures which are considered necessary by the VTS authority.” (IMO Res. A.857(20))

1. Examples of types of information that may be provided by the VTS within a Traffic Organization Service (IALA Guideline 1089)

|  |  |
| --- | --- |
| Information related to: | Examples |
| Traffic clearance | Give authorization under conditional circumstances to a vessel when: prior to or entering a VTS area;   * departing from a berth or an anchorage position within a VTS area; * entering into a fairway within a VTS area; or * prior to commencing a manoeuvre that may be detrimental to safe navigation.   Examples of conditions:   * a VTS sailing plan before entering a VTS area; * lock and bridge passage planning; * report position at determined reporting point/line/pilot station; * use a second fairway in case of bad visibility/weather; * use a tug boat in case of strong wind; * dredging or compass swing in confined waterway. |
| Anchorage | Examples of anchorage situations:   * organizing the movements to/from an anchorage position/area; * assignment of an anchorage position; * assisting vessels into anchorage position. |
| Enforcement | Examples of enforcement:   * speed limits; * adherence to rules regarding traffic routeing measures; * pilotage requirements; * other traffic regulations and possibly local by‐laws |
| Waterway (sea, channels and fairway) management | Examples of management measures:   * the use of one‐way traffic as an alternative of two way traffic, depending on the dimensions of vessel or the weather conditions; * organizing other traffic when a vessel has passed point of no return; * slot management to allocate vessels in a time window; * organizing the traffic concerning vessel dimensions in comparison to fairway restrictions; * instruct vessels when overtaking is not permitted; * establish and organise vessel safety zones in case of particular operations; * establish and organise exclusion zones; * instruct vessels to keep clear from special areas/positions; * organizing the traffic with regards to meteorological, hydrographical or other restrictions such as visibility, wind speed, current, sea state and under keel clearance. |

## 3.3 Purpose

The purpose of MS 3 is to provide information related to Traffic Organisation Service (TOS) in digital format to create means to reduce administrative burden and information overload, reduce the risk for miscommunication due to external interference, simplify work procedures, promote sustainable shipping, and increase navigational safety.

Information provided in a digital format could complement and/or replace verbal/voice communication. The steps to achieve this transition to digital information exchange may vary in different areas and for different types of vessels. Details about digital information exchange should be published by the VTS authority.

3.4 Operational approach

A Traffic Organization Service should be responsible for separating traffic in the interest of safety and efficiency. This separation could be defined in space, time and/or distance.

Enforcement may also be carried out within a Traffic Organization Service where the VTS should monitor adherence to applicable rules and regulations and to take appropriate action where required and within the authority of the VTS (IALA Guideline 1089 On Provision of Vessel Traffic Services).

Digital communication may apply to elements of the Traffic Organization Service that are not time critical situations.

Examples:

* Slot management: provide vessels digitally with priority of arrival and distance between two vessels
* Traffic clearance: provide vessels digitally with permission to proceed, impose conditions or deny entry
* Route information: provide vessels digitally with recommended route information
* Traffic information: vessel provide VTS digitally their intentions, such as overtaking of another vessel
* Information regarding restricted or no go area: the content (draft, closed fairway/port/quay etc.) can be provided digitally to vessels without using voice communication

All information provided digitally can complement and/or replace verbal/voice communication.

## 3.5 User needs

The use cases below are based on the information from table 3

The use cases are generic and are intended for description purposes only. Actions and template categories may differ for different countries. *Content in the column named “Template Info (technical)” is pending submissions from relevant stakeholders.*

## 3.5.1 Use case – vessel leaves quay

[When the vessel is ready to sail it sends its planned time of departure digitally to VTS where it is presented in the VTS application. The application alerts operator on upcoming traffic conflicts and advises on a solution, which is assessed by VTS. The VTS operator takes action and instructs vessel digitally to delay planned departure by thirty minutes. The instructions are graphically displayed in applications, acknowledged by the vessel and VTS operator provides delayed departure information to other traffic via digital and/or verbal means for vessels not able to receive information digitally.

Detailed information can be found in the Appendix 3, MS 3, Traffic Organization Service Template.]

| Time | Vessel Action | VTS Action | Info category in appendix |
| --- | --- | --- | --- |
| 00:00 | Sends ETD to VTS and requests permission to leave quay (in some cases additional communication by voice could be required). | Deny clearance. Give permission to leave in thirty minutes | Waterway management |
| 00:01 | The vessel acknowledges revised ETD | VTS receives acknowledgement and informs other traffic of revised ETD | Waterway management |
| 00:30 | The vessel informs VTS of intended departure | VTS issues traffic clearance with any appropriate conditions attached |  |

## 3.5.2 Use case – vessel transiting protected area

[As a vessels is approaching a marine mammal protected area where a speed restriction may or may not be active depending on the presence of marine mammals. When marine mammals are present, vessels are advised digitally that a speed restriction is in effect. For example, the vessel receives a digital message and the extent of the area is displayed in the navigational systems.]

| Time | Vessel Action | VTS Action | Info category in appendix |
| --- | --- | --- | --- |
| 00:00 | Sailing in the vicinity of marine mammal protected area | Receives information confirming presence of marine mammals and activates the speed restriction area. | Enforcement |
| 00:30 | Approaches a marine mammal protected area | Sends automated digital message regarding active speed restriction and the area (text and visual) | Waterway management |
| 02:00 | Entering the marine mammal protected area | Confirm that speed restrictions are in force | Waterway management |
| 02:10 | Exceeding speed limit | Send automated digital alert message requesting vessel conform to speed limit | Enforcement |

## 3.6 information to be provided

[See Appendix 3, MS 3, Traffic Organisation Service template.]

## 3.7 Associated technical services

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | ID (MRN) | Description | Architect(s) | Standardisation Body |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

## 3.8 Relation to other MSs

MS3 has a relationship with other MSs where it affects the VTS:

Examples may be different depending on the coastal state arrangements.

|  |  |
| --- | --- |
| **Description** | **Examples of data that could be of interest for MS 3** |
| MS 1 VTS INS | See Appendix 1, MS 1, Information Service Template |
| MS 2 VTS NAS | See Appendix 2, MS 2, Navigation Assistance Service Template |
| MS 3 VTS TOS | See Appendix 3, MS 3, Traffic Organisation Service Template |
| MS 4 Local Port Service | Delays, obstruction, cargo operations, port availability and anchorage area in the port, ISPS state, Marsec level |
| MS 5 Maritime Safety Information | All information depending on structure of MSI |
| MS 6 Pilotage Service | Pilot orders and updates |
| MS 7 Tug Service | Tug order and updates |
| MS 8 Vessel Shore Reporting | Notification of arrival, dangerous cargo etc. |
| MS 9 Telemedical | Delays |
| MS 10 Maritime Assistance Service | Notifications, routing, places of refuge |
| MS 11 Nautical Chart Service | Local Area updates, chart updates |
| MS 12 Nautical Publication Service | Updates to publication |
| MS 13 Ice Navigation Service | Ice routes, ice conditions, ice breaking assistance |
| MS 14 Meteorological Service | Weather information |
| MS 15 Real Time Hydro and Inf Service | Horizontal and vertical Tidal information in VTS area, available water column |
| MS 16 Search and Rescue service | Search pattern and vessel of opportunity |