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| IALA Guideline |

Gnnnn

[Provision of VTS with A DYNAMIC MIX OF CONVENTIONAL, AUTOMIZED AND AUTONOMOUS SHIPS]

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

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Table of Contents

[Assumptions 4](#_Toc160032254)

[1. introduction 5](#_Toc160032255)

[2. document purpose 5](#_Toc160032256)

[2.1. Using this Guideline 5](#_Toc160032257)

[2.2. Relationship to other documents 6](#_Toc160032279)

[3. IMO regulatory framework 6](#_Toc160032295)

[4. PROVISION OF VTS with A DYNAMIC MIX OF CONVENTIONAL, AUTOMIZED AND AUTONOMOUS SHIPS 8](#_Toc160032315)

[4.1. SITUATIONAL AWARENESS 9](#_Toc160032316)

[4.1.1. VTS 9](#_Toc160032317)

[4.1.2. Participating Ships 9](#_Toc160032318)

[4.2. INTERACTION 10](#_Toc160032319)

[4.2.1. VTS 10](#_Toc160032320)

[4.2.2. Participating Ships 11](#_Toc160032321)

[4.3. MANAGING A MIX OF CONVENTIONAL, AUTOMIZED AND AUTONOMOUS SHIPS 11](#_Toc160032322)

# Assumptions

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| The following assumptions have been adopted in preparing this document. These will be reviewed at each Committee meeting, noting the development of the MASS Code by the IMO Maritime Safety Committee.  It is expected that these assumptions will be addressed in the MASS Code as adopted [and amended IMO conventions and instruments] and will not be required in the final guidance document   1. MASS will be subject to existing IMO instruments, as amended, such as SOLAS. In addition, MASS will be subject to the MASS Code, which will address MASS issues not adequately or fully addressed in the applied base instruments. 2. MASS will be required to broadcast status as to who/what is in command at any time (Master/ROC/automated onboard command systems). 3. MASS will be required to participate in VTS in the same manner as conventional ships. That is, the same regulatory requirements to provide reports or information required by VTS and obligations with regards to the issue of advice, warnings and instructions as deemed necessary. 4. Standards for digital information and data exchange (technology/medium, data elements, format, syntax, etc) will be referenced in other IALA guidance being developed by the VTS Committee during the 2023-2028 work program, such as:    * *Task 1.1.3 - Develop guidance on VTS digital communications (operational aspects).*    * *Task 2.5.2 - Develop technical service specifications for digital data exchange between VTS and other entities - primarily ships.*    * *Task 2.8.1 - Develop a Product Specification S-212 under the S-100 framework for VTS.*    * *Task 2.82 - Review and update Recommendation R0145 (V-145) on the Inter-VTS Exchange Format (IVEF) Service (Output to be a revised Recommendation and associated Guideline including a technical service and/or product specification S-210).* 5. *This document will be complimentary and contribute to the overarching IALA guideline Gnnnn - Developments and implications of maritime autonomous surface ships for coastal authorities being prepared by the DTEC Committee.* |

# introduction

Interaction between VTS and ships has traditionally been via VHF voice. With the increasing use of automation and autonomy in how ships are navigated, controlled, and operated a new approach is required as to how interaction and situational awareness is achieved by both VTS and participating ships (i.e., the master/MASS Master/Remote Operations Centre).

# document purpose

The purpose of this document is to assist VTS providers prepare for interacting with ship traffic comprising a dynamic mix of conventional, automized and autonomous ships in a manner that ensures VTS achieves its purpose of contributing to the safety of life at sea, improve the safety and efficiency of navigation and support the protection of the environment within a VTS area by mitigating the development of unsafe situations through:

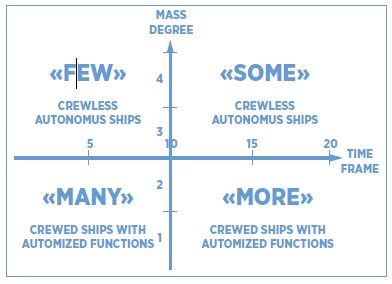
* providing timely and relevant information on factors that may influence ship movements and assist onboard decision-making.
* monitoring and managing ship traffic to ensure the safety and efficiency of ship movements.
* responding to developing unsafe situations.

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| IALA Guideline XXXX - <Title> is associated with IALA Recommendation R0127 - VTS Operations.  Recognizing the MASS Code adopted by IMO on <Date> is voluntary, Guideline XXXX is informative in nature and describes additional desirable practices for interacting with ship traffic comprising a dynamic mix of conventional, automized and autonomous ships. It is not necessary to conform to in order to claim compliance with Recommendation R0127.  *Note: With the evolution of MASS and entry into force of the mandatory MASS Code in 2028 it is expected this guideline will be reviewed and updated regularly.* |

## Using this Guideline

IALA standards, recommendations and guidelines specifically related to the establishment and operation of VTS have historically been developed on the basis that :

* Ships have at least a minimum level of manning on board to carry out the various tasks required to ensure safe, secure, and environmentally sound ship operations; and
* The interaction between VTS and ships is by VHF voice and, as a result, all traffic and VTS maintain situational awareness by being aware of each interaction between VTS and individual ships.

The increasing use of automation in the operation of ships, along with the anticipated increase in the use of remote control and autonomous operation of key functions, requires a different approach and therefore some adjustment to the accepted norms regarding interaction to provide information, or issue advice, warnings, and instructions to manage ship traffic and respond to developing unsafe situations.

This Guideline has been prepared in a manner that:

* Recognizes the evolution of automation and autonomy in the context of how ships are navigated, controlled, and operated over the next twenty years.
* Recognizes the operational requirements to manage ship traffic comprising a mix of conventional ships, automated, autonomous ships may not be adequately addressed in existing IALA standards, and additional guidance is required to achieve a level of safety that is equivalent to that traditionally expected.
* Identifies additional desirable practices to interact and manage ship traffic comprising a dynamic mix of conventional, automized and autonomous ships insofar as they are not adequately or fully addressed in other IALA recommendations and guidelines.
* Recognizes certain operational functions associated with a ship’s operation may be controlled automatically/autonomously, either onboard or from a location, or locations remote from the ship.
* Recognises that automated systems/ Masters/MASS masters/ ROCs may not always have the information/awareness that a VTS has.
* Provides a framework for VTS providers to adapt their processes and systems to ensure interaction continues to facilitate situation awareness both within the VTS and between VTS, allied services, automated systems, Masters/MASS masters and Remote Operation Centres.

## Relationship to other documents

This Guideline should be read in conjunction with:

1. **IALA Standard 1040 Vessel Traffic Services** - extensive guidance is provided on practices for the day-to-day operation of VTS, interacting with ship traffic and situational awareness in:

* VTS operations - *Recommendation 0127 – VTS Operations*, including:
  + *Guideline 1089 - Provision of a VTS.*
  + *Guideline 1141 - Operational Procedures for Delivering VTS.*
  + *Guideline 1110 - Use of Decision Support Tools for VTS Personnel*.
* VTS Communications - *Recommendation 1012 – VTS Communications*. In particular:
  + *Guideline 1132 VTS Voice Communications and Phraseology.*
  + *Guideline XXXX - VTS Digital Communications.*
* VTS Technologies - *Recommendation 0128 - VTS Systems and Equipment.* Specifically:
  + *Guideline 1111 - Establishing Functional and Performance Requirements for VTS Systems and Equipment.*
* VTS Data and Information Management - *Recommendation 0125 - VTS Portrayal.* Specifically:
  + *Guideline 1177 - Portrayal of VTS Information*.
* Guideline XXXX - Developments and implications of maritime autonomous surface ships for coastal authorities

1. **The IMO MASS Code and relevant conventions**, as amended.
2. **IHO /IALA standards**

* S-100xxxx
* S-200xxxx

# IMO regulatory framework

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| Noting the MASS Code is evolving rapidly the TG agreed that this section:   * Be reviewed/updated following MSC meetings, providing a high-level overview of the MASS Code functional requirements specifically related to VTS as being developed in:   + PART 2 - MAIN PRINCIPLES FOR MASS AND MASS FUNCTIONS.   + PART 3 - GOALS, FUNCTIONAL REQUIREMENTS AND PROVISIONS. * Be completed with finalisation of the non-mandatory code in the second half of 2024. |

To ensure the IMO regulatory framework for shipping keeps pace with rapidly evolving technological developments associated with MASS, the IMO has adopted a goal-based instrument (MASS Code). Specifically, the Code:

* Supplements other IMO instruments such as SOLAS.
* Provides a regulatory framework for the performance of remote control and autonomous operation of key functions, as applicable.

Key elements of the draft Code related to VTS currently include:

| **Text to be updated following each MSC / Correspondence Group meeting**  **MSC\108\MSC 108-4-1.docx** |
| --- |
| **2 Principles**  This Code is developed on the principles that it be:   1. [supplementary] [complimentary] to any applicable base ~~IMO~~ instruments, such as SOLAS, and only address MASS issues insofar as they are not adequately or fully addressed in the applicable base instruments; 2. holistic to ensure the objectives, aims and principles of the IMO base instruments are maintained whilst also [enabling ~~ensuring that~~] the challenges of MASS functions and operations [to be ~~are~~] addressed across all instruments; 3. goal based and addressing matters at the functional level; 4. non mandatory [~~but~~ although] developed in such a way as to facilitate future transition to mandatory status; and 5. technology neutral and taking note of industry practices and experience in the deployment of new technologies   **7.36 Master/ Master of a MASS**  *Master [of a MASS]* means the person [having command of] [being responsible for] a MASS (STCW)  Key principles agreed/requirements of a Master (*final location to be confirmed*):  [ .1 there should be a human master responsible for a MASS, regardless of mode of operation;  .2 such master may not need to be on board, depending on the technology used on the MASS and human presence on board, if any;  .3 regardless of mode of operation, the master of a MASS should have the means to intervene when necessary; and  .4 several masters may be responsible for a MASS on a single voyage, under certain conditions, and that only one master should be responsible at any given time (further consideration of what those conditions are is required).]  **7.61 Third parties**  Third Parties means persons that are not involved in the operations but engaging with the MASS, e.g. VTS, ports, pilots or other persons in the ROC for maintenance reasons, persons in distress, other vessels.  **7 Connectivity**  7.1 MASS should establish reliable, stable and secure connectivity with ROC and other external stakeholders such as MRCC, ports, VTS, [LRIT] etc.  **1.10 Services for navigation**  FR1.10.4 In case of MASS without crew on board, observed meteorological data, information relating to ship reporting systems, reports to VTS and danger messages should be reported automatically or remotely, as required. |

The IMO aims to have a non-mandatory MASS Code finalized in the 2nd half of 2024, and the adoption of a mandatory Code at MSC 110 (1st half of 2025), with a view to entry into force on 1 January 2028.

Key milestones to achieving this include:

|  | **MSC 108**  **1st half 2024** | **MSC 109**  **2nd half 2024** | **MSC 110**  **1st half 2025** | **1 July 2026** | **1 January 2028** |
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|  | Continue the development of the non-mandatory MASS Code  Finalize the non-mandatory MASS Code as annex to a draft MSC resolution | Finalization and adoption of the new non-mandatory MASS Code  Finalization and approval of amendments to existing instruments necessary for the entry into force of the new instrument | Adoption of a mandatory MASS Code and associated Convention(s) giving effect to the new MASS Code | Deadline for adoption for entry into force date of 1 January 2028 | Entry into force of Mandatory Code[[1]](#footnote-1) |

Specifically, the Code provides the framework for MASS to operate within the same framework and responsibilities of conventional ships.

# PROVISION OF VTS with A DYNAMIC MIX OF CONVENTIONAL, AUTOMIZED AND AUTONOMOUS SHIPS

VTS is recognised internationally as a navigational safety measure through the International Convention on the Safety of Life at Sea 74/78 (SOLAS).

VTS achieves its purpose by monitoring ship traffic and interacting with ships to provide information or issue advice, warnings, and instructions:

* On factors that may influence ship movements and assist onboard decision-making.
* To manage ship traffic to ensure the safety and efficiency of ship movements.
* To respond to developing unsafe situations.

Implicit in achieving this is the capability to:

* Maintain situational awareness through:
* Information and reports from individual ships such as route information, course and speed, attributes, cargo, and communication methods.
* Information and reports from allied services associated with ship movements and other factors influencing the waterway.
* Sensors, such as radar and AIS.
* The use of decision support tools to manage identified risks, support VTS personnel providing timely and relevant information, monitor and manage ship traffic, and respond to developing unsafe situations.
* Interact with individual ships as deemed necessary, on request from a ship or as a matter of procedure.
* Broadcast information to all ships.

Interaction between VTS and ships has traditionally been via VHF voice communications. With the increasing use of automation and autonomy in how ships are navigated, controlled, and operated, interaction via digital communication will increasingly become the norm for ships to provide information and reports to VTS and for VTS to interact when providing information or issuing advice, warnings, and instructions.

Key considerations in the transition to a mix of VHF voice communication and digital communications include:

* **Situational Awareness** - Ensuring situational awareness from both the perspective of VTS and participating ships (i.e., the master/MASS Master/ ROC) is achieved as historically has been the case using VHF voice, or is enhanced.
* **Interaction** – Interaction between the VTS and participating can be undertaken seamlessly and in a manner that the intent of messages is conveyed to actors is the same, irrespective of whether the communications is by digital means, VHF voice, means or both.
* **Management -** Systems, processes and procedures are in place to ensuring capability for interaction a capability to interact when managing ship traffic and responding to developing situations by either or both means.

These are interrelated and are critical to monitoring and managing ship traffic comprising a dynamic mix of conventional, automized and autonomous ships to ensure the safety and efficiency of ship movements through the provision of information or issue advice, warnings, and instructions.

## SITUATIONAL AWARENESS

A key factor in maintaining the safety and efficiency of navigation and support the protection of the environment within a VTS area is for both the VTS and individual ships to maintain situational awareness.

The International Dictionary of Marine Aids to Navigation defines situational awareness as:

*Situational awareness refers to the ability to identify, process, and comprehend the critical elements of information about what is happening in the surrounding environment at any given time.*

*It involves being aware of what is happening around you and understanding how that information, events, and your own actions will impact your goals and objectives, both immediately and in the near future.*

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| **Note**  The draft MASS Code (*MSC\108\MSC 108-4-1*) also refers to situational awareness throughout the document, particularly in   * **7 Terminology and Definitions**   *7.10 Autonomous Navigation System [Autonomous Navigation System (ANS) means a system which has the functionalities of situational awareness, route planning and determination for collision and grounding risk avoidance, shipʹs heading, speed and track control, etc. (MSC 107/5/10)*  *7.53 Situational Awareness*  *Situational Awareness means the perception of environmental elements and events with respect to time or space, the comprehension of their meaning, and the projection of their future status (Endsley 1995). (RBAT)*   * **PART 3 GOALS, FUNCTIONAL REQUIREMENTS AND PROVISIONS**   *1.5 Situational awareness*  *Situational awareness is the perception of the navigational and technical information provided and the comprehension of their meaning, as required for timely reaction to the situation.* |

The transition to interaction being conducted by both traditional VHF voice Communications needs to be managed in a way that ensures situational awareness is effectively achieved from both the perspective of VTS and participating ships (i.e., the master/MASS Master/ ROC). Refer to Section 4.3.

### VTS

In addition to sensors (e.g., radar, AIS, etc) to monitor transiting ships, VTS has traditionally achieved situational awareness through:

* Voice communications to:
  + Receive information and reports from individual ships such as route information, course and speed, attributes, cargo, and communication methods.
  + Receive information and reports from allied services associated with ship movements and other factors influencing the waterway.
* Decision support tools to manage identified risks, support VTS personnel provide timely and relevant information, manage ship traffic, and respond to developing unsafe situations.

With the increasing use of automation and autonomy in how ships are navigated, controlled, and operated, VTS will need to have the capability to interact with ships by both VHF voice and by digital communications, or a combination of the two (See Section 4.2).

### Participating Ships

Traditionally, VTS has contributed to the situational awareness of ship masters by providing timely and relevant information on factors that may influence ship movements and assist onboard decision-making through VHF Voice communications.

The use of simplex VHF channels has ensured that all participants are able to monitor exchanges between each other and the VTS centre. That is, both sides of any exchange are heard by all other ships.

Ensuring both sides of any exchange are heard by all other ships when interaction is by digital means needs careful consideration to ensure all parties receive relevant information on factors that may influence their movements and onboard decision-making in a timely manner with the increasing use of automation and autonomy in how ships are navigated, controlled, and operated requires careful consideration (See Section 4.2).

## INTERACTION

As the maritime domain moves to a dynamic mix of conventional, automized and autonomous ships, VTS should ensure it has the capability to interact with vessel traffic to provide information or issue advice, warnings, and instructions by digital means as well as VHF voice. Specifically, this will include:

* **Ships** (conventional, automated, and autonomous) - to provide reports and information required by a VTS.
* **VTS** - to provide ships (conventional, automated, and autonomous) with information on factors that may influence ship movements and assist ‘onboard’ decision-making.
* **VTS** - to issue advice, warnings, and instructions to manage ship traffic and respond to developing situations.

With the transition to digital interaction, it is important to recognise the use of the term’s ‘*interaction’* and ‘*communication’*, noting the IMO resolution for VTS uses the term ‘*interaction’* in the definition of VTS. That is:

‘*the capability to interact with vessel traffic and respond to developing situations’*

In summary:

* Communication - refers to the act of sharing information.
* Interaction - refers to acting in such a manner so as to affect the other.
* The key difference between ‘*communication’* and ‘*interaction’* is that ‘*interaction’* is a broader term while ‘*communication’* is a part of the ‘*interaction’.*

### VTS

As the maritime domain moves to an increasingly autonomous future with a dynamic mix of conventional, automized and autonomous ships, VTS should ensure it has the capability to interact with vessel traffic to provide information or issue advice, warnings, and instructions by digital means as well as VHF voice.

Significantly, interaction via digital communications will include person-to-person, person-to-machine, machine-to-machine, and machine-to-person communication.

Implementing this capability needs to be harmonised in a manner that the same information is available to all actors when required and designed in a way to minimise misinterpretations and to provide common situational awareness.

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| **Note**  IALA Guideline *GXXXX - VTS Digital Communications* describes practices associated with:   * Message structure and delivery for digital communications * Standardized digital phrases * Technologies for the exchange of VTS Information |

Key considerations for interacting digitally include:

1. Capability to interact in a manner that achieves a level of effectiveness and timeliness at least equivalent to that using VHF voice.
2. Digital interaction between VTS and ‘ships’ is provided through a standardized message structure (data elements, format, syntax) and phrases to:

* Facilitate clear, concise, and unambiguous interactions that are timely and effective.
* Ensure the digital communication is aligned with the practices described in *G1132 – VTS Voice Communications and Phraseology* and *GXXXX - VTS Digital Communications*.

1. Capability to communicate in real time at all times.
2. Capability to communicate effectively with individual ships either by traditional means (VHF voice), digitally or both.
3. Capability to broadcast to all participating ships simultaneously, either by traditional means (VHF voice), digitally or both.
4. Real time awareness of the:

* Entity in command of a ship [Master/MASS Master].
* Communications technology / medium to communicate/interact with entity in command of a ship [Master/MASS Master] at any point in time.
* Current MASS Status of participating ships.

1. Capability to automatically receiving and process reports or information required from participating ships by digital means.
2. Capability to acknowledging information and data received digitally

NB to recognise this will move to:

* VHF Voice
* Digitally
* • automated system onboard/remote
* • Autonomous systems
* • Combination of the above

The intent of messages conveyed to actors should be the same, irrespective of whether it is by voice or digital means.

Digital communications should have the same procedures as the voice communications. Digital communication should be processed the same way as voice communications, acknowledgement of the messages might be needed in some cases, especially in safety critical situations.

### Participating Ships

<to follow>

## MANAGING A MIX OF CONVENTIONAL, AUTOMIZED AND AUTONOMOUS SHIPS

The benefits of digital communications are well recognised, such as:

* Reducing workload through automating repetitive tasks
* Minimising the risk for misinterpretation / misunderstanding the intent of the information being conveyed through standardised message structure and formatting
* Facilitating the consolidation and processing of information for better decision support and a common situational awareness by all actors.

Managing a Mix of Traditional VHF Voice, Digital Communications, and Automated Data Exchange

Refer to GXXXX Guideline on VTS Digital Communications

**System Capabilities** – to support interaction and situational awareness. This includes receiving, processing and sending.

**Processes and Procedures** – to support interaction, situational awareness, and system capabilities.

These elements are interrelated, and practices to assist should be considered in that context, along with existing IALA Guidelines, to ensure VTS achieves its purpose in interacting with ship traffic comprising a dynamic mix of conventional, automized and autonomous ships.

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| **Note**  IALA Guideline *GXXXX - VTS Digital Communications* describes practices associated with managing a mix of traditional VHF voice, digital communications, and automated data exchange. |

| **Implications for VTS** | **Consideration / s** |  | **Functional Requirements** |
| --- | --- | --- | --- |
| 1. **Digital Communication / Interaction** | | | |
| 1.1 Capability to interact digitally in a manner that achieves a level of effectiveness and timeliness at least equivalent to that expected with interacting by VHF voice. | Adoption of standards to harmonize interaction between VTS, ships and ROCs by digital means in a manner that:   * Ensures communication/interaction conveys the same meaning and intent, irrespective of whether it is provided by VHF voice or digitally. * Enables ships to meet their reporting requirements by digital means. * Enables VTS to interact with ships and manage ship traffic to ensure the safety and efficiency of ship movements by providing information or issuing advice, warnings and instructions as deemed necessary by digital means. | 1.1.1 | Standards for VTS digital communications  Digital interaction between VTS and ‘ships’ is provided through a standardized message structure (data elements, format, syntax) and phrases to:   * Facilitate clear, concise, and unambiguous interactions that are timely and effective. * Ensure the digital communication is aligned with the practices described in *G1132 – VTS Voice Communications and Phraseology.*  |  | | --- | | ***Note*** *–* Guidance on VTS Digital communications (operational aspect) being prepared by Working Group 1 (Task 1.3.1) includes:   * The intent of messages * Message structure and delivery | |
| 1.1.2 | Capability to communicate in real time at all times. |
| 1.1.3 | Capability to communicate effectively with individual ships either by traditional means (VHF voice), digitally or both. |
| 1.1.4 | Capability to broadcast to all participating ships simultaneously, either by traditional means (VHF voice), digitally or both. |
| 1.1.5 | Database and DST capabilities to accommodate the above and enhance decision making by identifying and escalating developing situations. (*Refer to 2. Core VTS System Capabilities below*) |
| * 1. Real time awareness of the: * Entity in command of a ship [MASS Master] [Responsible Person]. * Communications technology / medium to communicate/interact with entity in command of a ship [MASS Master] [Responsible Person] at any point in time. * Current MASS Status of participating ships. | Capability, processes, and procedures to maintain awareness of who/what is in command of a participating ship at all times. [MASS Master] [Responsible Person] | 1.2.1 | Capability to receive and acknowledge information about the person or entity in command, and the degree of autonomy in use Update the DST as to the ‘Responsible person’ and associated communications means (voice / digital). In particular, to ensure the Responsible person’ / communications method always presented to VTS personnel |
|  | 1.2.2 | Database and DST capabilities to accommodate the above, |
| * 1. Receiving and processing reports or information required from participating ships by digital means. | How does a VTS receive and assimilate reports or information received digitally and process it | 1.3.1 | Receiving information and reports digitally  Systems, processes, and procedures to   * + Receive reports and information required by the VTS, as described in G1141 - Operational Procedures for Delivering VTS such as:     - Pre-arrival information (vessel identity, route information, vessel details, etc)     - Entering the VTS area     - Movements within the VTS area     - Requests for clearance   + Assimilate information and data into databases / DST.   + Information readily available / presented to VTS personnel  |  | | --- | | Technical Working Group be requested to:   * Review update *IALA Guideline G1111 - Producing Requirements for the Core VTS system* to reflect receiving, processing, displaying data received digitally seamlessly with manually entered data * Provide advice as to whether an updated G1111 is sufficient or specific requirements should be included in this Guideline | |
| 1.3.2 | Processing / Quality  Capability to process and verify information and reports received and, where necessary, interact with the sender to clarify / confirm. |
| 1.3.3 | Systems and Technologies  Interoperability and network connectivity to accommodate the above |
| * 1. Acknowledging information and data received digitally | How does a VTS acknowledge information and data received digitally | 1.4.1 | Acknowledgement of information and reports  Reports and information provided digitally are acknowledged to the sender by the VTS.  Processes and procedures to acknowledge data received digitally:   * Verification and authentication (automatic, operator, independent) * Automatic acknowledgement * Keeping human in the loop (database/DST) |
| * 1. Interaction to confirm / acknowledge information and data received digitally   Information exchange, such as:   * Reporting requirements * Provide relevant traffic information * Provide navigational / fairway information * Vessel defects or deficiencies, such as navigation or manoeuvring equipment failure * Updating information with allied services |  | 1.5.1 | Interaction received digitally from a ‘ship’ is responded to as would be by voice consistent with local operational requirements.   |  | | --- | | ***Note*** *–* Guidance on VTS Digital communications (operational aspect) being prepared by Working Group 1 (Task 1.3.1) includes operational descriptions and use cases for the potential technical services identified in the description for Maritime Service for VTS such as:   * Voyage Information Service - The service supports exchange of voyage plans, text messages and area messages * Route Information Service - The service provides route recommendations and/or route validation for ships. * Traffic clearance Service - The service provides vessels with permission to proceed, impose conditions or deny clearance.   S 100 product specifications | |
| 1. **Core VTS System Capabilities (Database, DST and network)** | | | |
| * 1. Integrating digital information and data with existing systems in a manner consistent with receiving this verbally | How to assimilate and integrate digital information into the core VTS systems  Compilation of replay data for incident / event occurring  IALA *Guideline G1111-1 - Producing Requirements for the Core VTS system* | 2.1.1 | Database / DST applications have the capability to assimilate and integrate information and data regardless of the source.  MASS status / Person or Entity in command always displayed to VTS personnel |
| * 1. Ability to interact / communicate with participating ships digitally in a manner consistent with using VHF voice for: * Functions as described in 3.1, 3.2, 3,3 and 3.4 below * General interaction to confirm data provided, intentions etc | How to interact outwardly | 2.2.1 | Database / DST applications have the capability to identify the communications medium for individual ships in real time and present this to VTS personnel.  MASS status / Person or Entity in command always displayed to VTS personnel |
| 1. **Fulfilling the purpose of VTS through:** | | | |
| Mitigating the development of unsafe situations through: | IMO Resolution A.1158(32)  *3.1 The purpose of VTS is to contribute to the safety of life at sea, improve the safety and efficiency of navigation and support the protection of the environment within a VTS area by mitigating the development of unsafe situations through:* |  |  |
| * 1. Providing timely and relevant information on factors that may influence ship movements and assist onboard decision-making |  | 3.1.1 | Processes and procedures to interact with the ‘responsible person’ to provide timely and relevant information, irrespective of whether the ship is conventional, or MASS which may include:  *.1 position, identity, intention and movements of ships*  *.2 maritime safety information*  *.3 limitations of ships in the VTS area that may impose restrictions on the navigation of other ships (e.g. manoeuvrability), or any other potential hindrances*  *.4 other information such as reporting formalities and International Ship and Port Facility Security Code (ISPS Code) details*  *.5 support for, and cooperation with, allied services* |
| * 1. Monitoring and managing ship traffic to ensure the safety and efficiency of ship movements. |  | 3.2.1 | Processes and procedures to interact with the ‘responsible person’ to manage ship traffic, irrespective of whether the ship is conventional, or MASS, which may include:  *.1 planning ship movements in advance*  *.2 organizing ships under way*  *.3 organizing space allocation*  *.4 establishing a system of traffic clearances*  *.5 establishing a system of voyage or passage plans*  *.6 providing route advice*  *.7 ensuring compliance with and enforcement of regulatory provisions for which they are empowered* |
| * 1. Responding to developing unsafe situations, |  | 3.3.1 | Respond to developing unsafe situations irrespective of whether the ship /ships involved are conventional or MASS, which may include:  *.1 a ship unsure of its route or position*  *.2 a ship deviating from the route*  *.3 a ship requiring guidance to an anchoring position*  *.4 a ship that has defects or deficiencies, such as navigation or manoeuvring equipment failure*  *.5 severe meteorological conditions (e.g. low visibility, strong winds)*  *.6 a ship at risk of grounding or collision*  *.7 emergency response or support for emergency services* |
| * 1. Issuing advice, warnings, and instructions | IMO Resolution A.1158(32)  *3.2 To achieve their purpose, VTS should* *provide information or issue advice, warnings and instructions, as deemed necessary.* | 3.4.1 | Processes and procedures to issue advice, warnings, and instructions to the ‘responsible person’, irrespective of whether the ship is conventional. |
| 1. **Managing Communications / Interaction** | | | |
| Managing a mix of VHF voice, digital communications, and automated data exchange, including: |  |  | |  | | --- | | ***Note*** *–* Guidance on VTS Digital communications (operational aspect) being prepared by Working Group 1 (refer Task 1.3.1) includes:   * Managing a Mix of Traditional VHF Voice, Digital Communications, and Automated Data Exchange | |
| * 1. Interacting by both conventional means and digital means with individual ships |  |  | VTS should have processes/procedures/systems in place to know the communication method to interact with an individual ship at any point in time.  VTS has the capability to receive reports and information by ships digitally and in a manner that is assimilated within the VTS system and added to the VTS operational picture within the VTS centre (e.g adjacent sectors) and shared with relevant stakeholders in a manner at least as timely as is currently achieved.  Managing interaction to individual vessels that ensures the message and intent is delivered to all ships as would be the case by VHF voice. This may include interacting both by voice and in parallel by digital means.  The VTS system should have the capability to identify the ‘responsible person’ for each ship at all times. That is, a master, pilot, ROC, etc. |
| * 1. Managing interaction with multiple ROC’s. |  |  |
| 1. **Special Circumstances** | | | |
| * 1. A ship needs to be contained / controlled to mitigate a developing unsafe situation. |  |  | <For further consideration, pending development of the MASS Code> |
| * 1. Instructing an ROC to take control of a fully autonomous ship to mitigate a developing unsafe situation |  |  | <For further consideration, pending development of the MASS Code> |
| **6. Allied services** | | | |
| 6.1 VTS may maintain communication with allied services where information is received from ships digitally, pending domestic regulations. |  |  | <For further consideration, pending development of the MASS Code> |
| * Pilotage |  |  |  |
| * Tug operators/linesmen |  |  |  |
| * Agents |  |  |  |
| * Other |  |  |  |

1. [↑](#footnote-ref-1)