

Liaison note to the IALA VTS Committee

on

THE ROLE AND POSITION OF VTS IN VTM

This document is a revised version of a Liaison note to the IALA Council on the role and position of VTS in VTM (doc. VTS30-output-18).

At its 46th session of December 2009, Punta Arenas/Chile, the Council (taking into account Council's approval at its 45th Session, May 2009, of doc. VTS29-output-6 on the VTM Concept and Scope)

- noted the document VTS30-output-18 and
- concluded that a number of issues as reflected needed further clarification and
- recommended that, for reasons of understanding, wording may be simplified.
- furthermore the Council indicated that a revised document should have the approval of the VTS Committee.

Working Group 4 on VTM of the IALA VTS Committee, at its intersessional Meeting in Istanbul/Turkey, 19-22 January 2010, reviewed and revised the mentioned document.

Consequently the VTS Committee at its 31st Session is requested to

- approve the developed vision, definitions, clarifications and views on the defined role, position and information position of VTS within the VTM framework, as set out in this document;
- discuss and provide comments to WG4 of the Committee with respect to the anticipated effects for the existing primary services as a result of the role, position and information position of VTS within the VTM framework;
- agree that a number of related and relevant issues concerning the management and exchange of data and information should (such as reflected in the sections 6.3 and 7.2) be reflected in future work of the VTS Committee;
- support the recommendation to include the concept of VTM in the tasks of reviewing and proposing amendments to relevant VTS documents on VTS policy (e.g. IMO Assembly Resolution A.857(20), IMO MSC Circ.1065, IALA recommendation V-103 and the VTS Manual) in the coming IALA session 2010-2014.

THE ROLE AND POSITION OF VTS IN VTM

1. Introduction

The Vessel Traffic Services (VTS) Committee has undertaken to develop a view of the future role and position of VTS within the overarching functional framework of Vessel Traffic Management (VTM), taking into account the interdependent roles and responsibilities of allied and other related services such as law enforcement, security, search and rescue (SAR) and incident response and management.

In order to develop a view of the role and position of VTS within the VTM functional framework, an extensive evaluation of the present and anticipated future services from VTS needs to be clarified along with the relationship between VTS and various stakeholders within the VTM framework. This paper addresses that need .

The possible contribution of VTS towards Security in the maritime domain is reflected in a separate document (VTS30-output-19) for approval by the Council.

2. Objectives of this document

The objectives of this document are to:

- inform the IALA VTS Committee about the results and views of WG4 on VTM concerning the role, position and information position of VTS within the VTM functional framework;
- identify the relationships between VTS and its related stakeholders in order to:
 - further develop the functional requirements for measures and services within the VTM framework;
 - identify other issues to be investigated, developed or resolved by the VTS Committee.

The document includes:

- | | | |
|-----------|---|--|
| Section 3 | - | Summary of the functional framework of VTM |
| Section 4 | - | Further clarification on VTM |
| Section 5 | - | Strategic, tactical and operational domain of VTM |
| Section 6 | - | The role and position of VTS within the VTM functional framework |
| Section 7 | - | Services of VTS within the VTM framework |
| | | ○ the primary services |
| | | ○ anticipated effects for INS, NAS, TOS from VTM |
| | | ○ Recommendation |

3. The functional framework of VTM¹

The IALA definition of VTM is:

“Vessel Traffic Management is the functional framework of harmonized measures and services to enhance the safety, security and efficiency of shipping and the protection of the marine environment in all navigable waters”.

This functional framework is arranged on a global, supranational, national and/or regional scale to establish conditions for safe, secure and efficient maritime traffic and for the efficient and effective use of the resources engaged. The functional framework will enable collaboration among the public and private stakeholders involved. The arrangements involved between the various stakeholders in the maritime domain should be consistent, coherent and recognized by present and future (inter)national legislation and guidelines.

Arrangements are agreements, international treaties, understandings or other legal mandates between two or more stakeholders within the functional VTM framework on the implementation of measures, the provision of services, the coordination of efforts, the allocation of resources and any other conditions needed to attain the aims of VTM;

Measures are the efforts by Competent Authorities to set the conditions to be respected, and the provision of services to meet the aims of VTM and the compelling needs of stakeholders;

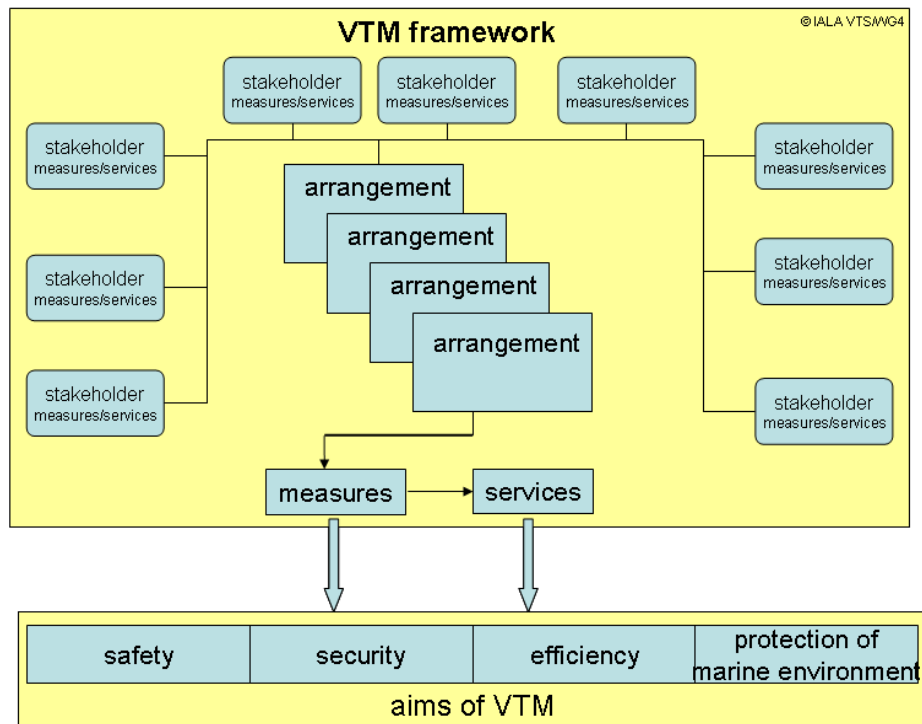
A service within VTM is an activity or a combination of activities, provided by one or more stakeholders, for the benefit of VTM stakeholders.

The aims of VTM are to enhance the safety of shipping and protection of the marine environment; the efficiency of maritime transport; the security of shipping, ports and infrastructure; and to meet stakeholder demands for reliable and current information to support the efficient employment of assets.

These aims are to be achieved through the provision of a functional framework of measures and services that enable both ship-borne and shore-based stakeholders within VTM, to interact and exchange information to enhance or support:

- The decision-making process in matters concerning maritime safety and security, efficiency of navigation and of vessel traffic;
- The prevention and control of marine pollution and emissions from vessels;
- The strategic planning of vessel movements in confined and congested waters;
- The monitoring of vessel traffic worldwide;
- The efficient management of vessel movements in all navigable waters;
- The operations of allied services;
- The integration of all existing and new services;
- The other services from outside the VTM framework, contributing to vessels' routing and waterway management;
- The optimal utilisation of the marine infrastructure and/or assets;
- The services to contingency response, search and rescue, and incident and accident response.

¹ VTS29-output-6 Liaison note to IALA Council VTM Concept and Scope, approved by Council at its 45th Session, May 2009



4 Further clarification on VTM

As defined in IMO Resolution A.857(20):

"VTS is a service, implemented by a Competent Authority, designed to improve the safety and efficiency of vessel traffic and to protect the environment. The service should have the capability to interact with the traffic and respond to traffic situations developing in the VTS area"

However, while the definition of VTS is clearly understood, there remains some misunderstanding on the interpretation of the definition and the use of the term Vessel Traffic Management.

VTM can be described as the global functional framework for all navigable waters, within which VTS may be the central instrument among various others. This framework shall be supported by information management.

VTM therefore is not: "VTS+", VTMIS¹, a series of interconnected VTS centres, one or more ship monitoring systems, a large area VTM centre or an equivalent of e-navigation².

¹ VTMIS has been used to describe the promotion and enabling of information exchange with allied services, and between VTS centres. The scope of VTMIS however is too limited to be used for the entire information management with respect to the VTM framework.

² e-navigation however is supportive to the VTM framework and will provide the capabilities to support the provision of measures and services within the VTM framework

5. Strategic, tactical and operational domain of VTM

VTM should be seen as the overarching, structured and functional framework of strategic, tactical and operational efforts in interaction with all stakeholders within the maritime domain worldwide.

Stakeholders within VTM operate at a strategic, tactical and/or operational level in order to ensure coordinated efforts among the various associated parties. Therefore, VTS as a stakeholder within VTM can operate in the strategic, tactical and operational domain of VTM. The role and position of VTS, however, can vary for these levels, and this is further explained in section 6 of this document.

5.1 Strategic efforts

The strategic efforts focus on the pro-active preparation and planning of the conditions for safe, secure and efficient vessel traffic through the timely exchange of relevant information.

Communication at the strategic level implies the exchange of relevant information, needed to anticipate, prepare for and execute a task in order to avoid circumstances that could lead to a hazardous or undesired occurrence. These strategic efforts may result in measures and services being imposed, such as policymaking or voyage planning. The time horizon may range from several years to several hours.

5.2 Tactical efforts

The tactical efforts focus on the active monitoring and decision-making part of the safe, secure and efficient management of vessel traffic; including enforcement of, or compliance with rules and regulations, and the timely exchange of relevant information.

Communication at the tactical level includes the exchange of relevant information, needed to support decision-making and proper action in the execution of a task. - These tactical efforts include measures and services, such as monitoring of vessel traffic, the management of vessel traffic, and the *supervisory control* of potential hazardous occurrences. The time horizon may range from several hours to several minutes.

5.2.1 Clarification of supervisory control

In discussing the tactical efforts of VTS within the VTM functional framework, especially the active efforts regarding the safe and efficient handling of maritime traffic, the concept of *supervisory control* was used to describe application of these efforts and activities.

Consequently a new definition for “supervisory control in this context was developed:

"Supervisory control is a pro-active approach to the supervision of vessel traffic to prevent hazardous occurrences from happening by identifying and controlling the risk of these potential events in advance".

The execution of supervisory control will be supported by the availability and foreseen increase of relevant and more reliable information, and the utilisation of appropriate (risk) measures. This execution may also have consequences for the competences of VTS personnel.

5.3 Operational efforts

Operational efforts focus on the reactive part of the management of vessel traffic (both ship-borne and ashore) and starts with an intervention. This intervention is usually followed by a subsequent interaction between associated stakeholders. The interaction comprises of communication on operational level and of the ‘real-time’ exchange of relevant information to support real-time decision-making. This may lead to a response to (undesired) occurrences.

These operational efforts include the safe conduct of navigation, navigational assistance by VT3, maritime pilotage³ and the assistance to other allied services. The time horizon may range from several minutes to immediate.

6. The role and position of VT3 within the VTM functional framework

In order to prevent confusion it should be made clear that the term “VT3” is used when referring to the “service”. Otherwise, specifically referring to the organization, the term “VT3 Authority” will be used.

The **role** of VT3 within VTM is its functional contribution to the aims of VTM and its **ability** to interact with other stakeholders.

The **position** of VT3 within VTM is considered its status relative to other stakeholders and the services they provide, in its capacity to contribute to the aims of VTM.

The existing role and position of VT3 within the VTM functional framework should be considered to identify the relationship between the VT3 Authority and the other stakeholders within VTM, and to what extent they interact with each other.

This interaction may benefit other stakeholders when the VT3 Authority provides vital information in addition to the provision of traditional VT3 services such as Information (INS), Navigation Assistance (NAS) and Traffic Organization (TOS).

The more this information is valued by the receiving stakeholders, the stronger the position of VT3 will be with regard to the information exchange.

A strong position of VT3 may therefore provides the VT3 Authority with the opportunity to take a more central role in the management of information within the VTM framework and to make a greater contribution to the benefits of VTM.

The **information position** of VT3 within VTM is the position in which VT3 is placed relative to other stakeholders, that identifies and defines its capability to collect, manage, maintain, process, provide and/or distribute data and information.

This will determine the capability of the VT3 to manage the information exchange between stakeholders in the VTM framework and to define the purpose for which this information may be used or re-used.

Being in the strategic, tactical and operational domain of VTM, a VT3 Authority is expected to identify the development of dangerous situations, maintain a safe and efficient vessel traffic flow, and inform stakeholders of the risks associated with vessel traffic movements in the VT3 area. The VT3 Authority is also expected to provide support and to inform other stakeholders within the VTM- framework in accordance with specific arrangements with those stakeholders. Hence, a VT3 should define its relationships with other stakeholders and its subsequent information position.

The information position of the VT3 Authority⁴ should include its institutional position (legal mandate, structure and resources), its tasks and responsibilities (mission, policy, objectives), its ability to provide information as required, its own information requirements (data required for the execution of the VT3 tasks) and any limitations on data-exchange and data-sharing.

³ To be revised into “maritime pilotage on board” in case of inconsistency with current legislation.

⁴ In those areas where no VT3 is established, but services within VTM are provided, the organizations providing those services should also define their relationships with other stakeholders and identify their information position as described

This implies that the information position of VTS should be clearly defined and enhanced, so that information exchange between VTS and other stakeholders within the VTM framework is firmly established.

6.1 Relevant legislation, recommendations and guidelines

- UNCLOS and other UN-conventions related to the maritime domain
- SOLAS (IMO)
- IMO Resolution A857(20)
- Other relevant IMO Regulations and Recommendations as mentioned in IMO Res. A857(20) and published after 1997
- IALA Recommendations and Guidelines related to VTS
- IALA VTS Manual 2008
- International and regional developments and initiatives affecting the maritime domain

6.2 The existing and future role and position of VTS

The existing role of VTS focuses on the safety and efficiency of vessel traffic, protection of the marine environment and the relationship with allied services. According to Resolution A.857(20), the primary services of VTS should be provided within a declared VTS area. However, with respect to future functions, the role and position of VTS within the VTM framework may extend beyond the VTS area, as the VTM framework is applicable to all navigable waters⁵.

The measures and services provided in the maritime domain are still evolving as a result of the developments as identified for VTM, and this may lead to changes in the role or position of current VTS within the VTM framework and to new capabilities for the VTS Authority.

Therefore the role of VTS within the VTM framework needs to be adaptable, but also sustainable. It is the responsibility of national, regional or local competent authorities, to decide on and to organize the provision and execution of the necessary measures and services within VTM and those for VTS.

It should be recognized that VTM can exist without VTS. This may depend on geographical and traffic circumstances and/or organizational arrangements in some areas. If this is the case, measures and services within the VTM framework, which are usually designated to VTS centres, may be executed or provided by other organizations (e.g. Coastguard, monitoring stations and reporting services).

6.3 Information management and exchange

The increasing number of participants and stakeholders with interest in the maritime domain requires further consideration on information management and –exchange by VTS.

It is expected that the needs and increasing interest in the information and services within the VTM framework may be met by VTS. It is also recognized that the present information capabilities of VTS may not fulfil all the information needs and requirements of the stakeholders in the near future. However, the wider distribution of data by VTS to stakeholders within and beyond the VTM framework may be restricted by legal constraints. Aspects such as property rights, confidentiality, ownership, liability and security of data are still subject to study and investigation.

In addition it should be noted that information exchange needs further harmonization, standardization and interoperability.

⁵ The role and position of VTS as described in this document does not affect the function and responsibilities of VTS, as defined in Resolution A.857(20). The role and position - as described in the afore mentioned definitions - determine the relationship with other stakeholders within VTM. Based on this relationship, specific arrangements between the VTS and those stakeholders may be put in place. The scope of any such arrangement should not exceed the context of current VTS. If that context is changed - e.g. VTS in international waters - the scope of any specific arrangement should not exceed that new context.

6.4 Vision and developments

The need to define the role and position of VTS within VTM is a consequence of the development of the overarching concept. The vision here is that the VTM functional framework, of which VTS is part, should be user driven, that user requirements of individual stakeholders within the VTM framework are still subject to further identification and development. Consequently, the development and the definition of the role and position of VTS should be kept under revision.

7. Primary services of VTS within the VTM framework

The existing primary VTS Services contribute to the VTM framework are constrained by preconditions for use and re-use of information. However, this contribution of VTS in conjunction with other stakeholders in the maritime domain will make VTM more coherent, while improving each stakeholder's individual position within the VTM framework. A strong information position of VTS serves the interests of other stakeholders in order to fulfil their compelling needs for the availability and exchange of more, better, reliable and timely information, and it is foreseen that an improved information position of other stakeholders will enhance the primary services of the VTS.

7.1 Primary services

A VTS, at a minimum, should- comprise an information service and may also include others, such as navigational assistance service or a traffic organization service, or both of these services, defined in Resolution A.857(20), as follows:

- An information service is a service to ensure that essential information becomes available in time for on-board navigational decision-making.
- A navigational assistance service is a service to assist on-board navigational decision-making and to monitor its effects.
- A traffic organization service is 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.

7.1.1 Information Service (INS)

Information Service (INS)⁶ : An Information Service provides essential and timely information to assist the on-board decision-making process. The function of INS⁷ is outlined below and identifies the major activities that may be expected from this service type, together with an indication of the role that it can be expected to undertake. This service type involves maintaining a traffic image and allows interaction with traffic and response to developing traffic situations. An INS provides essential and timely marine information to assist the on-board decision-making process, which may include:

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

⁶ VTS manual 2008

⁷ VTS Manual 2008

7.1.1.1 Function positioned in the strategic, tactical and/or operational domain.

The INS functions may appear in the strategic, tactical and/or operational domain.

| INS: | Strategic | Tactical | Operational |
|--|-----------|----------|-------------|
| The position, identity, intention and destination of vessels; | | X | X |
| Amendments and changes in promulgated information | X | X | |
| The mandatory reporting of movements | X | X | X |
| Meteorological and hydrological conditions, notices to mariners..... | X | X | X |

7.1.1.2 Anticipated effects for INS due to the positioning of VTS in the VTM framework

The scope of INS provided within the VTM framework is anticipated to change little. However, it is expected that the exchange of information by conventional means will decrease and will be replaced by automated and digitalised options for the collection, storage and exchange of information. Therefore it is anticipated that the way this service is executed will change.

The extend of eventual changes need further study.

7.1.2 Navigational Assistance Service (NAS)

Navigational Assistance Service (NAS)⁸ : A Navigational Assistance Service may be provided in addition to an Information Service and/or Traffic Organisation Service. It is a service to assist in the on-board navigational decision-making process and is provided at the request of a vessel, or when deemed necessary by the VTS. Navigational Assistance Service provides essential and timely information to assist the on-board decision making process and may inform, advise and/or instruct vessels accordingly. Such assistance requires positive identification and continuous communication throughout the process. It is important that the provision of Navigational Assistance is agreed between the vessel and the VTS providing the service. Acceptance by the vessel of the Navigational Assistance Service should be established, and the beginning and the end of navigational assistance should be clearly stated.

The function of NAS⁹ is outlined below and identifies the major activities that may be expected from this service type, together with an indication of the role that it can be expected to undertake. However, it should be noted that a new guideline on the functionalities of NAS in the meanwhile are approved by the IALA Council. The amended list of functionalities is taken into account in the table of section 7.1.2.1.

Navigational Assistance may involve the provision of information, such as:

- Course and speed made good by a vessel;
- Position relative to fairway axis, navigational features and/or way-points;
- Proximity to navigational hazards; and
- Positions, identities, intentions and any restrictions of surrounding traffic.

Navigational Assistance may also involve the additional provision of advice and/or instruction, and may include or require:

- An assessment of the suitability of the vessel to respond to the advice provided including an assessment of linguistic ability;
- A review of vessel characteristics including manoeuvrability relative to the area in which the service is provided and any defects or deficiencies;
- An assessment of the environmental conditions;
- An assessment of the implications of the cargo carried;

⁸ VTS Manual 2008

⁹ VTS Manual 2008

- A review of the proposed sailing plan;
- Recommendations on measures to maintain the sailing plan noting that any advice on courses and speeds should be result orientated;
- The use of message markers;
- The use of a dedicated frequency; and
- Restriction of other traffic movement.

7.1.2.1 Function positioned in the strategic, tactical and/or operational domain.

| | Strategic | Tactical | Operational |
|---|-----------|----------|-------------|
| NAS: | | | |
| Course and speed made good by a vessel | | X | X |
| Position relative to fairway axis, navigational features and/or waypoints | | X | X |
| Proximity to navigational hazards | | X | X |
| Positions, identities, intentions and any restrictions of surrounding traffic | | X | X |
| An assessment of the suitability of the vessel to | | X | |
| A review of vessel characteristics including manoeuvrability | X | X | |
| An assessment of the environmental conditions | | X | |
| An assessment of the implications of the cargo carried | | X | |
| A review of the proposed sailing plan | X | X | |
| Recommendations on measures to maintain the sailing plan... .. | | X | X |
| The use of message markers | | | X |
| The use of a dedicated frequency | | | X |
| Restriction of other traffic movement | | | X |

7.1.2.2 Anticipated effects for NAS due to the positioning of VTS in the VTM framework

The implementation and the utilisation of new technologies on board does not result from the positioning of VTS within VTM.

Requests for NAS from vessels may decrease gradually due to the increasing availability of valid information and the increasing reliability of technical equipment on board for decision making, and the expectation that the vessel will become more self-sufficient.

However, this outlook may be influenced by the level of confidence the mariner will have in the reliability and integrated presentation of the information, in the quality of the systems and the ability to use this information for effective decision-making.

Therefore it is not unlikely that the expected decrease may be preceded by a temporary increase of requests for NAS.

Although NAS may be less affected than INS and TOS by the positioning of VTS within VTM, the provision of NAS from the shore (deemed necessary by VTS) may increase due to an increasing demand by authorities to ensure safe and efficient use of the navigable waters and protection of the environment.

7.1.3 Traffic Organisation Service (TOS)

Traffic Organisation Service (TOS)¹⁰ : A Traffic Organisation Service is a service to provide for the safe and efficient movement of traffic and to identify and manage potentially dangerous traffic situations. A Traffic Organisation Service provides essential and timely information to assist the on-board decision-making process and may advise, instruct or exercise the authority to direct movements.

¹⁰ VTS Manual 2008

7.1.3.1 Function positioned in the strategic, tactical and/or operational domain.

| | Strategic | Tactical | Operational |
|--|-----------|----------|-------------|
| TOS: | | | |
| The position, identity, intention and destination of vessels | X | X | |
| Amendments and changes in promulgated | X | X | |
| The mandatory reporting of movements | X | X | X |
| Information such as meteorological | | X | |
| Specific information such as traffic congestion | | X | |
| The allocation of waterspace | | X | X |
| Establishing and operating a system of traffic | | X | |
| Establishing routes to be followed ... | | X | X |

7.1.3.2 Anticipated effects for TOS due to the positioning of VT3 in the VT3 framework

The provision of TOS is the one VT3 service where the impact of VT3 is most likely to be felt and where changes may result in the conduct of VT3 management techniques.

It is anticipated that strategic efforts within VT3 (as clarified in section 5.1) will influence the tactical and operational decision making with regard to the organisation of vessel traffic within the VT3 area.

As the VT3 concept develops and, as the tools provided by e-navigation extend the effectiveness of data transfer, so too will there be an increased interdependency between the detailed organisation of vessel traffic by a VT3 and the more strategic decision making under VT3. This will be seen in particular with regard to the sharing of data for advanced traffic planning and traffic monitoring, and co-operation with and coordination between allied services, port and terminal operations, emergency services and adjacent VT3.

7.2 Recommendation on the further development of the VT3 framework

Considering the expectation that VT3 should have a major and central role and position within a global VT3 framework. It may also be concluded that the quality of its services and management will become more visible to other stakeholders, and its information position may become more prominent. In order to further develop and determine the role and position of VT3 within VT3, as well as the (future) provision and execution of its measures and services, a number of aspects and considerations, (such as legislation, the compelling need for enhanced information, the opportunities and limitations towards data-exchange and data-sharing, other conceptual developments) should be taken into account.