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Common data model on the information exchange on VTS Requirements and Procedures

# Summary

The IMO Resolution A.1158(32) Guidelines for Vessel Traffic Services (VTS) stipulates that VTS authorities shall ensure the promulgation of information concerning VTS requirements and procedures, as well as the categories of ships required to participate in VTS, through appropriate nautical publications. In connection with the development of VTS digital information services and the digitalization of navigational information, it is necessary to exchange information on VTS requirements and procedures in common data model and digital data format. Accordingly, this document invites discussion on the development of a new S-200 product specification under the VTS Committee.

# Background

The VTS Committee is developing the S-212 VTS Digital Information Service Product Specification, as well as standards for Traffic Clearance and Route Information Services, in order to advance maritime services in the field of vessel traffic management.

# Discussion

## Publication of VTS Requirements for Mariners

In accordance with IMO Resolution A.1158(32), VTS authorities are required to promulgate the following information through appropriate nautical publications.

* the categories of vessels required or expected to participate;
* communication means to be used for reporting and the interaction between ship and shore;
* areas of applicability;
* the times and geographical positions for submitting reports;
* the format and content of the required reports;
* the VTS provider responsible for the operation of the service; and
* services to be provided to participating ships.

Since information on VTS requirements and procedures is provided through various sources, such as port user guides and lists of radio signals, IALA has defined a template through Guideline G1144. The structure of the template is as follows:

1. Summary

1.1 VTS Identifier

1.2 Coverage of a VTS area

1.3 Service time

2. Ships required to participate

2.1 Mandatory

2.2 Non-Mandatory

3. VHF Working Channels

4. Reporting Requirements

4.1 Type of Report (Sailing plan, Position report, Deviation report, Final report, Dangerous goods report, Harmful substances report, Marine pollutants report, Any other report)

5. Additional information the VTS promulgates (if any)

6. Chartlet for VTS area

With the transition of shipboard operational environments toward paperless navigation, the development of VTS digital data services is anticipated through the establishment of maritime service standards within the framework of e-Navigation. In this context, it is required that information concerning VTS requirements and procedures be developed in a standardized data model and digital format. This will ensure that mariners are provided with consistent and up-to-date access to VTS-related information.

## Status of S-100/S-200-Based Related Product Specifications Development

### S-212 VTS Digital Information Service Product Specification

IALA VTS Committee WG2 is currently developing S-212 to support the development of VTS maritime services. For the operation of VTS digital information services, the group has designed a data model covering the elements required for information exchange and organized various use cases. The use cases specified in S-212 are as follows:

* Enter VTS Area
* Vessel within VTS Area
* Request VTS Area Information
* Report Accident
* Sending Accident Information in VTS Area
* Ship Navigational Assistance

From the perspective of the developed data model, the following feature types are included:

* VTS Digital Information Service Message
* Ship Information (Ship Information, Ship Dynamic)
* Accident and Navigational Equipment Condition
* VTS Sector Information (Navigational Warnings, Maritime Meteorological Warnings)

With regard to the VTS Sector Information included in the S-212 data model, it is considered that the content pertains to alerts and navigational environment. However, elements concerning the extent of the sector, as well as the required reporting contents and formats, are not included.

### S-127 Marine Traffic Management Product Specification

The Nautical Information Provision Working Group (NIPWG) of the International Hydrographic Organization (IHO) is developing the S-12X series of product specifications in order to convert the contents of nautical publications into digital data. In particular, for the purpose of marine traffic management, the development of the S-127 Marine Traffic Management Product Specification is currently in progress.

The S-127 standard encompasses a wide range of information relevant to marine traffic management, and, with specific reference to vessel traffic service (VTS), it adopts the following feature type structure:

* Organisation Contact Area
  + Supervised Area
    - Reportable Service Area
      * Vessel Traffic Service Area
      * Ship Reporting Service Area
      * Local Port Service Area

In relation to vessel traffic service (VTS), the feature types include the following attributes: Category of Vessel Traffic Service, which specifies the type of service; Service Access Procedure, which defines the procedures for service access; and Requirements for Maintenance of Listening Watch, which sets forth the requirements applicable to VTS operations.

* Category of Vessel Traffic Service

1. Information Service

2. Traffic Organization Service

3. Navigational Assistance Service

4. Ship Reporting Service

5. Local Port Service

While the S-127 Marine Traffic Management Product Specification incorporates some features and attributes pertaining to vessel traffic services (VTS), it does not encompass the detailed information on VTS requirements and procedures as defined by IALA G1144.

## The Need for Developing a Common Data Model for VTS Requirements

In order for vessels participating in VTS to access and respond to VTS services, standardized VTS information is required. For this reason, IALA has defined Guideline G1144, and each VTS center ensures that mariners can obtain VTS information through appropriate nautical publications. With the ongoing transition to a paperless navigation environment and to support the development of VTS digital information services, the establishment of a standardized format for VTS information is essential.

In particular, VTS Committee WG1 is developing the Guideline on VTS Digital Communication. Within this framework, the digital VTS services are defined to include planning functions, route information functions, VTS information functions, and traffic information functions. Among these, a use case has been designed for the reporting service under the VTS information function. The reporting service requires that, when a vessel requests information on the types and contents of VTS reports, the VTS shall provide relevant requirements and procedures in digital data format. However, such information on VTS requirements is absent from the current S-212 data model.

The standard for VTS requirements and procedures may therefore be addressed either by extending the existing S-212 or by developing a new, separate standard. The S-212 standard, which is under development as the product specification for VTS digital information services, is intended to support the route functions, VTS information functions, traffic functions, and planning functions defined in the Guideline on VTS Digital Communication. To achieve this, it is considered more appropriate to establish references to external data models rather than to incorporate all VTS information directly into S-212.

* Information defined within the S-212 data model: VTS Digital Information Service Message, Static and Dynamic Ship Information
* External standards referenced by the S-212 data model: S-421 Route Model, S-124 Navigational Warnings, S-125 Aids to Navigation Status, S-412 Weather Warnings

The core VTS information, such as the types of ships required or expected to participate, the means of communication for reporting and ship–shore interaction, the applicable area of operation, the time and geographical position for report submission, the format and contents of required reports, the responsible VTS authority, and the services provided to participating vessels, represents fundamental elements of the VTS service. If these elements are designed as a separate data model and established in a reference relationship with S-212, it would be possible to develop a digital information standard for VTS core information while minimizing the impact on the ongoing development of the VTS digital information service.

## Application of a Common Data Model for VTS Requirements and Procedures

In accordance with IMO Resolution A.1158(32) Guidelines for Vessel Traffic Services (VTS), if a data model and standardized digital format concerning VTS requirements and procedures, as defined in IALA G1144, are developed, the following use cases may be anticipated:

Use Case 1. Publication of VTS Information

* Publication of digital data (GML) containing VTS requirements and procedures; or
* Transformation of digital data into a document format through the application of a style sheet, followed by publication.

Use Case 2. Incorporation of VTS Basic Information into Nautical Publications

* Provision of VTS information as digital data when national hydrographic offices issue nautical publications;
* Inclusion of such information in nautical publications, or partial conversion into S-127 data by the national hydrographic office.

Use Case 3. Application in Voyage Plan Information Service

* Application of the VTS Information Functions defined in the Guideline on VTS Digital Communication;
* Provision of VTS information by the VTS authority to support ships during voyage planning.

Use Case 4. Application in VTS Reporting Service

* Application of the VTS Information Functions defined in the Guideline on VTS Digital Communication;
* Provision of VTS information when a ship requests the format and contents of reports from the VTS authority.

Use Case 5. IALA VTS Committee Survey

* Utilization of standardized format data in collecting VTS-related information within IALA VTS Committee surveys.

# Action requested of the Committee

The Committee is requested to:

1. Discuss on the necessity of developing a common data model for VTS requirements and procedures, as proposed in this document.

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-2)
2. Leave open if uncertain [↑](#footnote-ref-3)