Input paper: [[1]](#footnote-2) VTS58-9.1.5

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM **□** ENG **□** PAP **X** Input

**□** ENAV **X** VTS **□** Information

Agenda item [[2]](#footnote-3) 9.1

Technical Domain / Task Number 2 2.5.2, 2.8.1

Author(s) / Submitter(s) KRISO - Sewoong OH

Plan for the Development of a VTS Digital Information Service Testbed

# Summary

The development plan for a verification framework (testbed) is hereby shared in order to support the development of the VTS Digital Information Service product specification and the associated service standards currently under development by the IALA VTS Committee.

# Background

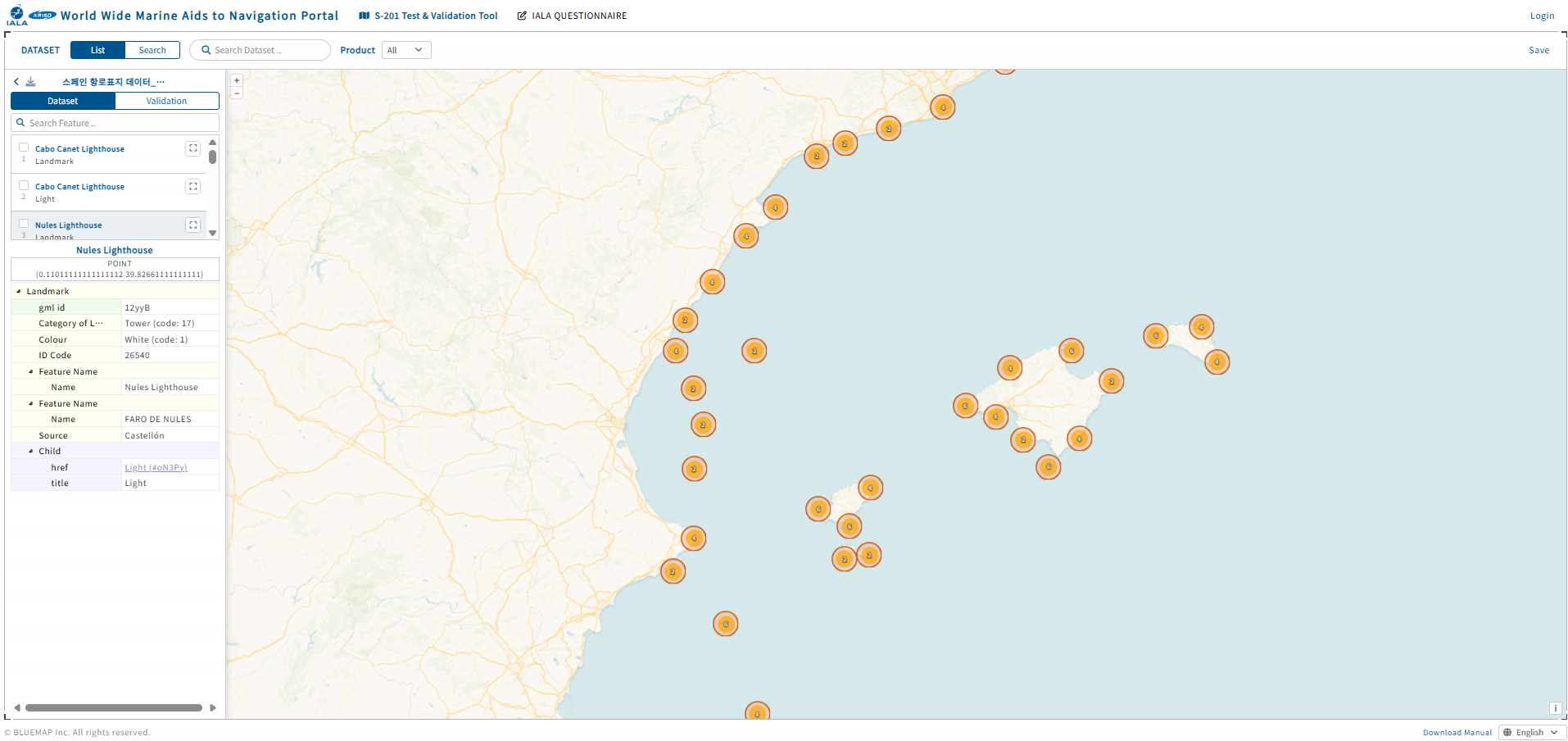
The IALA ARM Committee is developing and operating the S-201 Test & Validation Tool in support of the development of the S-201 and S-125 Aids to Navigation information standards. The VTS Committee, with the objective of developing VTS digital information services, is undertaking the development of the S-210 and S-212 information exchange standards, as well as maritime service standards such as Route and TCS. In pursuit of the standardized development of digital services within the maritime domain, the Open Digital Incubator (ODI) project is being carried out to promote cooperation in test frameworks.

# Discussion

## S-201 Test & Validation Tool Developed by the ARM Committee

The IALA ARM Committee is operating a web-based S-201 Test & Validation Tool in support of the development of the S-201 baseline AtoN (Aids to Navigation) information standard and the S-125 update information standard. Member States of IALA are able to input AtoN information in accordance with the S-201 standard through two methods: (i) manual input based on the S-201 Feature Catalogue (FC), or (ii) simplified input using an Excel template. The tool also allows users to visualize symbols on a web map. Furthermore, the tool provides validation functions for S-201 data, enabling checks on relationships between AtoN equipment and structures, detection of missing mandatory attribute values, and verification of the overall quality of AtoN data.

Although the S-201 Test & Validation Tool was originally developed to support the standardization of S-201 within IALA, it is also being used for additional purposes. These include enabling IALA Member States to provide review comments on the AtoN information exchange standards, and supporting their national AtoN information management systems in the transition to S-201. In this way, the tool offers valuable insights for IALA Member States in the development of systems capable of managing AtoN information in compliance with international standards, facilitating information exchange among national hydrographic offices, and supporting the provision of e-Navigation maritime services such as AtoN incident reporting and update information.



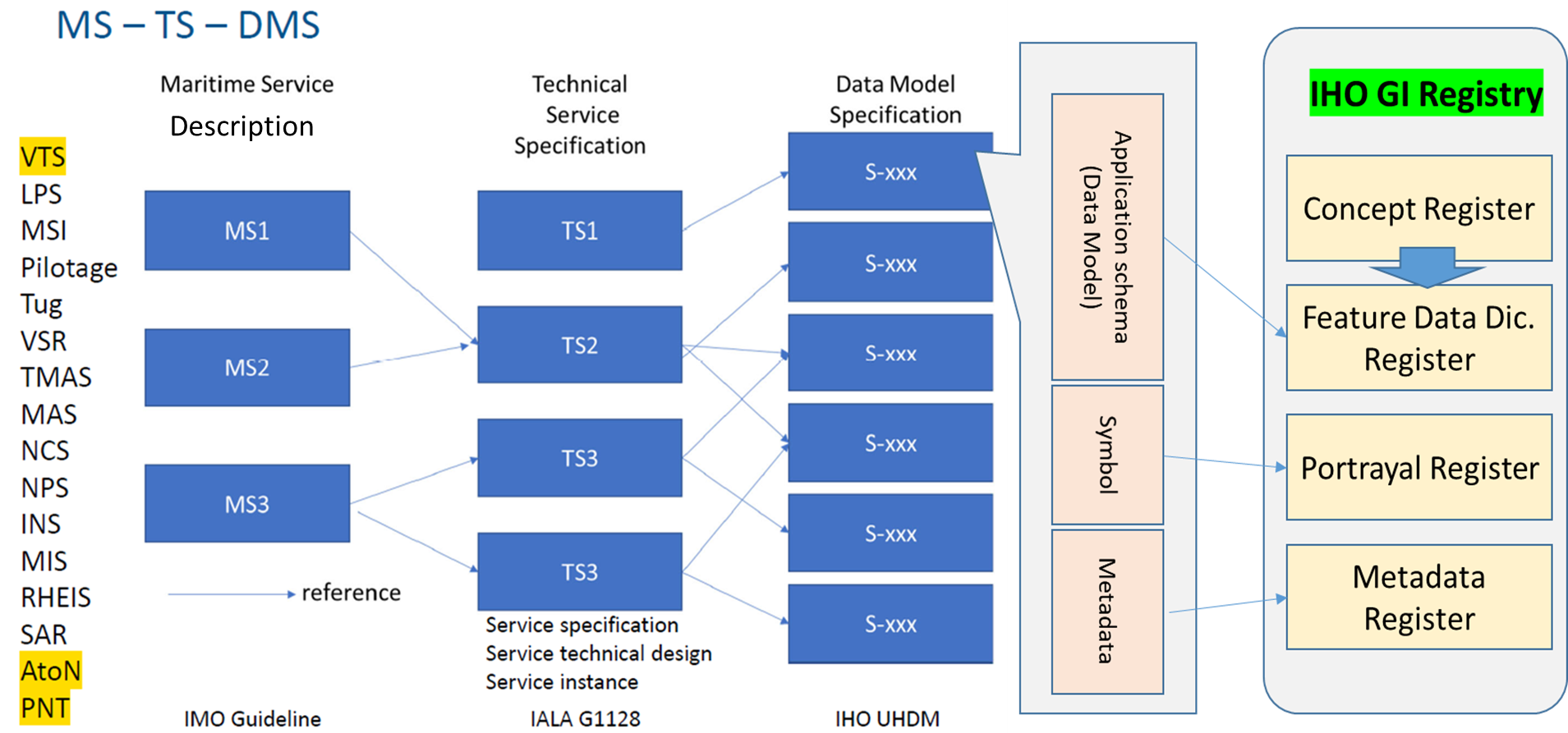
1. S-201 Test & Validation Tool

## The Need for the Development of a VTS Digital Information Service Testbed

The IMO, IALA, and IHO are cooperating in the development of maritime service standards. IMO is developing service definitions, IALA has defined guidelines and templates for service standard development, and IHO is developing and operating the S-100 Universal Hydrographic Data Model and the Geospatial Registry.

The S-210 and S-212 standards under development by the VTS Committee define data models and quality assurance criteria for information exchange. The Route/TCS maritime service standards incorporate technical aspects whereby VTS centers and ships exchange S-421 and S-212 data, with the services operated through interfaces defined in SECOM.

As the information exchange standards and service standards related to VTS digital information services include technical specifications, IALA Member States participating in the VTS Committee may find it challenging to review and provide comments on the content of the standard documents. It is therefore considered that review and cooperation on the development of VTS digital information services could be facilitated by enabling the input of VTS information and its visualization on a web map for verification.



1. Development of e-Nav maritime service

In addition, as the VTS digital information service consists of procedures involving repeated requests and confirmations between shore and ship, the symbols displayed on both the VTS operating system and the shipboard user system are expected to play a significant role. It is therefore considered that, through a VTS digital service test and validation framework, the developed symbols could be reviewed and a broad exchange of views could be facilitated.

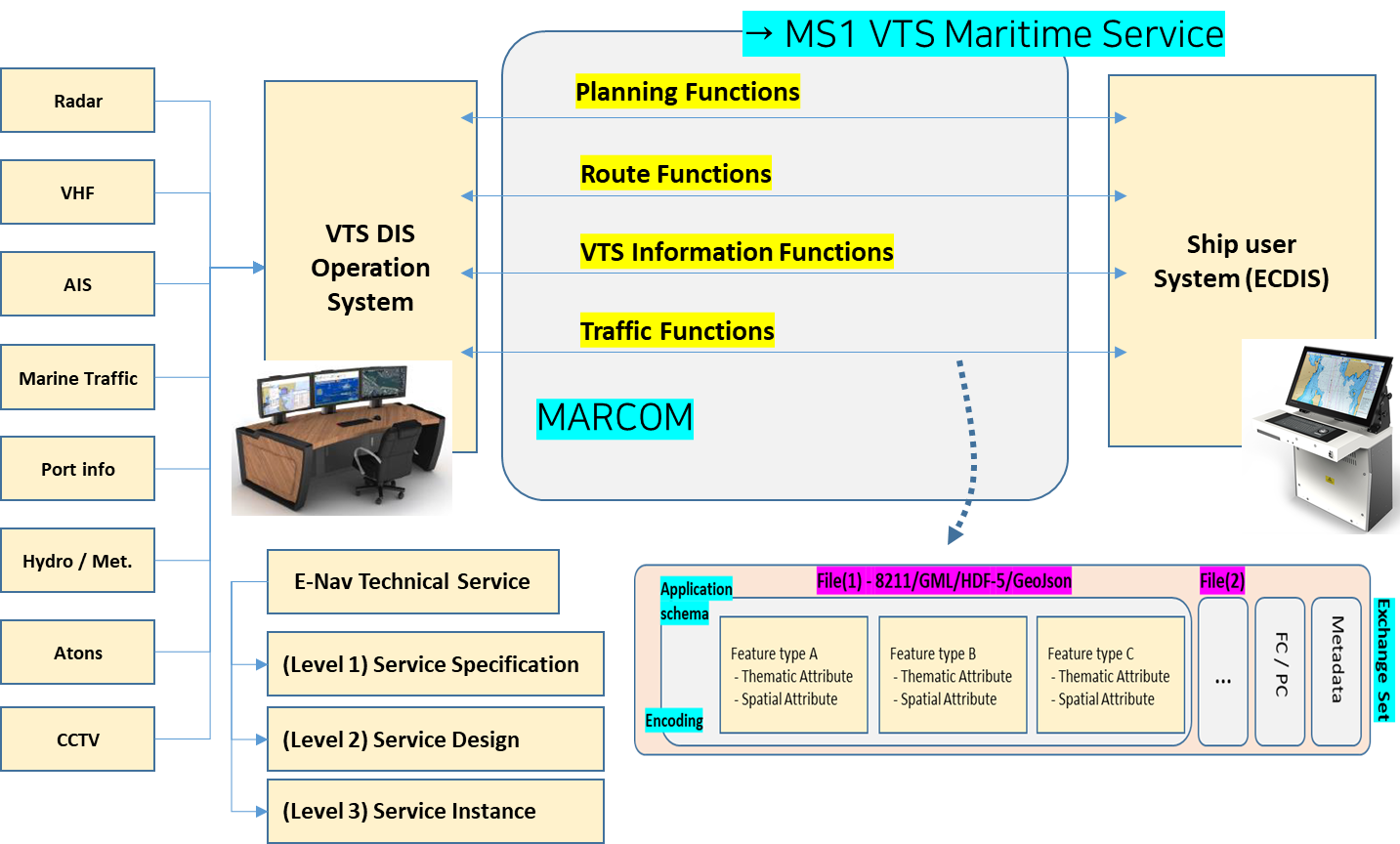
## Plan for the Development of a VTS Digital Information Service Testbed

### Concept and Scope of the VTS Digital Information Service (DIS) Testbed

IALA is developing both service standards and data standards in order to provide VTS digital information services (DIS) to vessels participating in VTS. Through the guideline on VTS digital communication, VTS DIS has been defined as comprising 12 services grouped into four categories.

As illustrated in Figure 3, the VTS DIS operational framework delivers Planning, Route, VTS Information, and Traffic Functions to ships by utilizing sensor data collected from various sources. The development of such services can be carried out in accordance with the service standards and data standards established by the IALA VTS Committee.

The VTS DIS Testbed is intended to serve as a platform for testing the service standards and product specifications developed by the VTS Committee, with particular focus on the 12 services defined under the four categories in the guideline on VTS digital communication.



1. VTS Digital Information Service

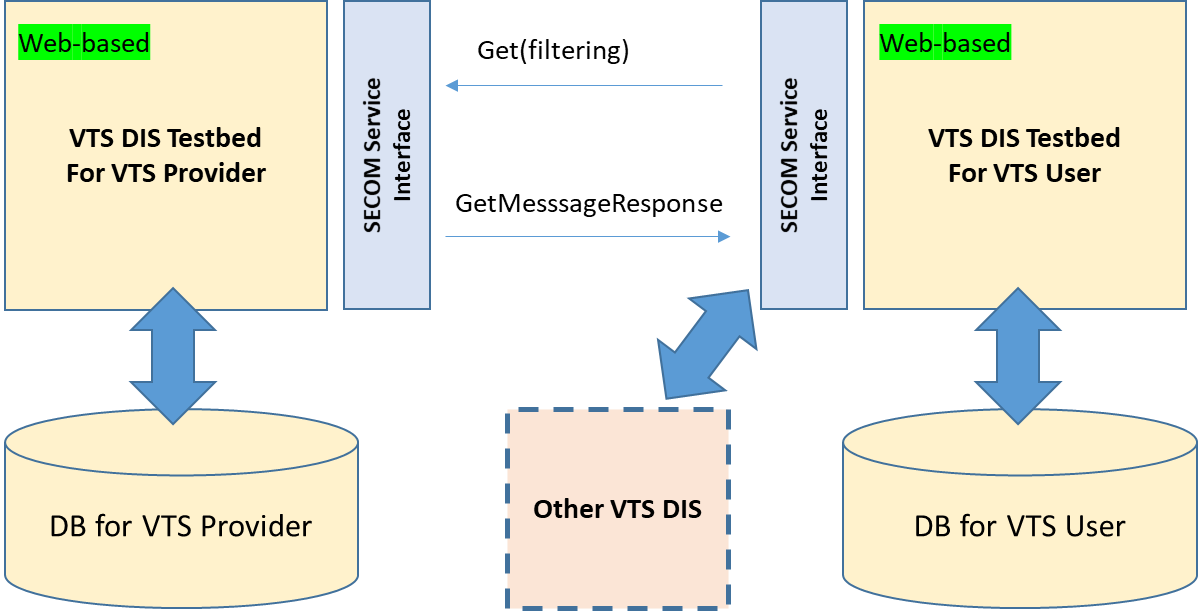
### Structure of the VTS Digital Information Service (DIS) Testbed

Since VTS digital services involve repeated exchanges of information between shore and ship, the system is composed of two perspectives: the interface for the VTS provider and the interface for the VTS service user. The main characteristics of each part are as follows:

* VTS Provider Perspective: Service composition based on SECOM, provision of 12 services grouped into four categories (Planning Functions, Route Functions, VTS Information Functions, and Traffic Functions).
* VTS User Perspective: Design of routes using S-421 and access to SECOM services provided by the VTS service.

The VTS DIS Testbed, currently under development by KRISO, is being implemented as a web-based system. It consists of a Testbed for VTS Providers and a Testbed for VTS Users. Functional development is being carried out in accordance with the Service Specification (Design) standards developed by the VTS Committee and the S-200 Product Specification. In line with the operational procedures of the VTS DIS sub-services, the testbed provides the capability for data exchange between VTS Providers and VTS Users.

Furthermore, to support collaborative development with IALA Member States, the web-based Testbed for VTS Users is being designed to interconnect with VTS digital information services developed by IALA Member States, thereby facilitating technical cooperation.



1. VTS DIS Testbed

### Plan for the Development of the VTS Digital Information Service Testbed

KRISO, with the support of the Korea Coast Guard, plans to conduct research on the development of VTS digital services and equipment during the period 2025–2029. Through participation in the activities of the IALA VTS Committee, KRISO intends to contribute to the development of VTS digital service standards, while also promoting the development of a testbed to support IALA’s standardization efforts and foster cooperation with IALA Member States. The testbed development will be pursued according to the following schedule, noting that detailed activities and timelines are subject to change:

* Design of the VTS DIS Testbed: by the end of 2025
* Prototype development of the VTS DIS Testbed (Provider and User): by June 2026
* Development and validation of TCS and Route service functions: by December 2026
* Development and validation of additional VTS DIS functions: during 2027
* Validation of the operational versions of IALA VTS DIS service and data standards: 2028–2029

In addition, KRISO plans to participate in the Open Digital Incubator (ODI) project, organized to support test frameworks for standardized maritime services, in order to cooperate on the development of VTS digital data services and to examine the application and integration of MCP.

# Action requested of the Committee

The Committee is requested to:

1. refer to the necessity and plan for the development of the VTS DIS Testbed as presented 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)