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| WORKING PAPER |

Architecture of the Digital Delivery of VTS Information

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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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# Background of the document

The VTS Committee is tasked with formulating technical service specifications for the digital data interchange between VTS and associated entities (VTS-2.5.2) and developing a Product Specification within the S-100 framework for VTS message-based communication (VTS-2.8.1). Currently, the primary focus lies on enhancing the ship-to-shore data exchange for VTS services. In line with this, the VTS Committee Technical Working Group has drafted a VTS digital service architecture.

For an overview of these tasks, refer to the IALA Task Register https://iala-task-register.com/, specifically tasks VTS-2.5.2 and VTS-2.8.1.

VTS Committee initiated the task of developing a technical services specification, taking into account relevant IALA documents, including G1128 on the specification of e-Navigation technical service, G1157 on Web service based S-100 data exchange and G1161 on the evaluation of platforms for the provision of Maritime Services.

During the VTS 53 and VTS 54 sessions, the committee established the initial framework for the VTS digital services architecture. Serving as the foundation for service descriptions and product specifications for VTS services, this architecture outlines the data and information exchange between VTS and ships. Additionally, it provides clarity on its scope, defines terms, and identifies involved stakeholders. Further details on this architecture can be found in the annex attached to this communication.

A critical consideration during its development was ensuring the architecture adhered to existing guidelines relating to digital communication and information services.

Recognizing that DTEC has produced several technical service-related documents and ARM is developing some of the service specifications, the VTS Committee intends to circulate the draft architecture for feedback from the other committees. VTS Committee sees that insights and comments on the architecture from other committees can refine the document, aligning it closely with relevant Recommendations and Guidelines.

The purpose of the Chapter 2 is to explain the high-level architecture on how different technologies and specifications relate to facilitate a digital data exchange for VTS information. The architecture is trying to take into account the data exchange between VTS and ships for both MASS and conventional ships.

# VTS DIGITAL SERVICES ARCHITECTURE

Afbeelding met tekst, diagram, schermopname, lijn

Automatisch gegenereerde beschrijving

1. High level view on the Digital Delivery of VTS Information

## Digital Delivery of VTS Information

VTS Navigational ECDIS/MASS Services

* This is the subset of the technical services from the VTS system that is targeting ECDIS (S-100 capable) and/or regulated MASS navigation systems.
* The communication between the VTS system and the ECDIS (S-100 capable) should follow set regulations, in particular IEC 63173-2:2022 (SECOM) and IALA G.1157 (Web Service Based S-100 Data Exchange)
  + SECOM provides the standardised and cyber secure communication protocol between ship and shore
* SECOM requires a service and identity registry, which can be provided by the Maritime Connectivity Platform (MCP)

VTS Other Services

* This is the subset of the technical services from the VTS system that is targeting non-regulated systems on board a ship.

Non-standard VTS Services

* The exchange of data through other means than standardized technical services (e.g. email, website, …)

S-100/S-200 Data domain

* Datasets exchanged with the VTS using data model that comply IHO S-100
* Examples of such a data models include but are not limited to S-210, S-212, S-421

Other data domains

* Datasets exchanged with the VTS using other than S-100 compliant data models, these can possibly been harmonized by other standards in the maritime domain (e.g. IMO Compendium)

Kuva, joka sisältää kohteen teksti, kuvakaappaus, kartta, diagrammi

Kuvaus luotu automaattisesti

1. VTS Digital Services Architecture

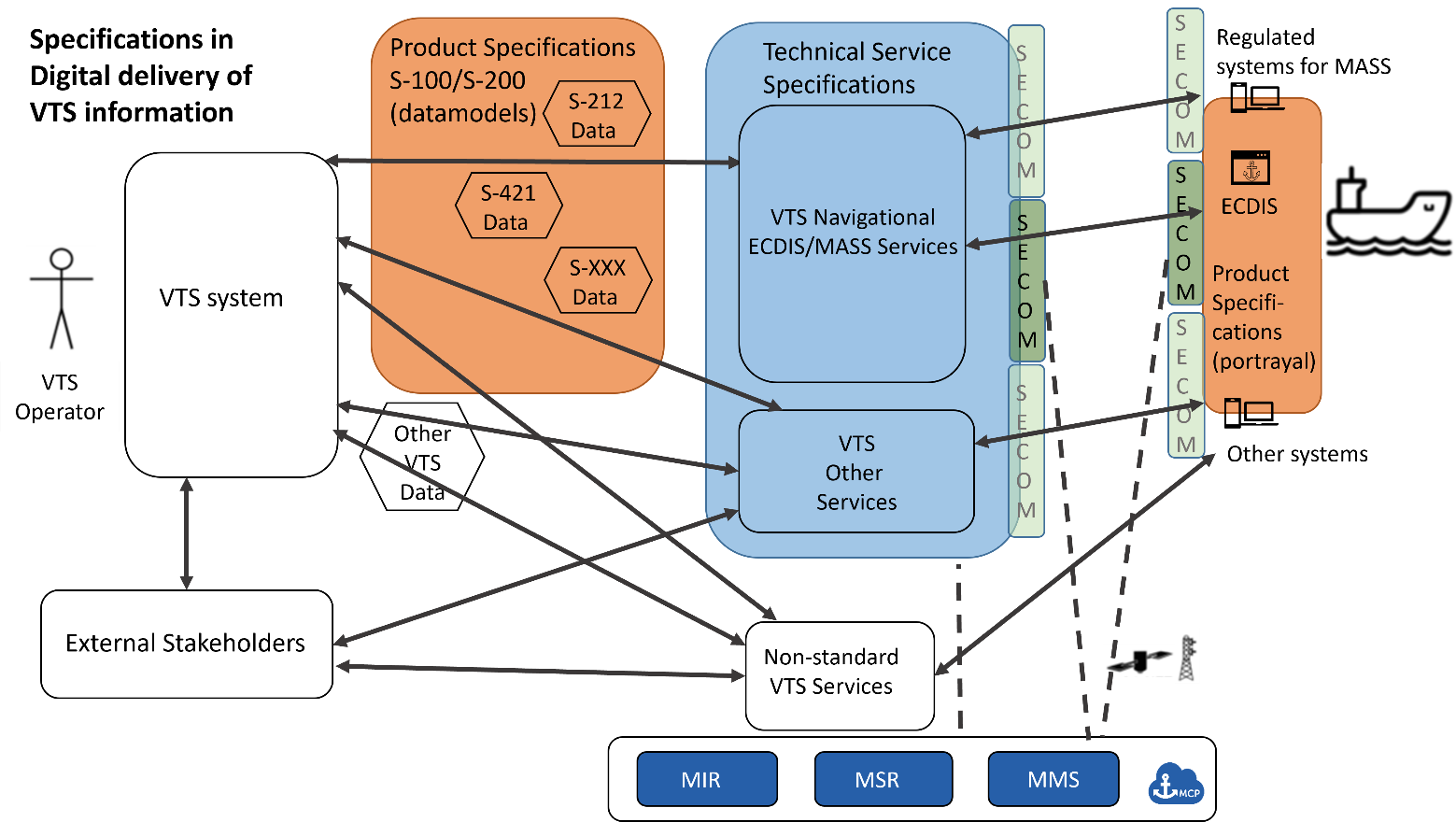
## Role of Specifications in Digital delivery of VTS information

Technical Services Specifications

* Describe the functionality of the services and how to implement the digital data exchange using specific technologies (see IALA Guideline G.1128)
* The technical service specifications are referenced in the Maritime Services description in the context of eNavigation for VTS as “associated technical services” (MSC.1/circ.1610)

Product Specifications

* Describe the data model used in digital services to deliver information between VTS and other entities.
* Product specifications in S-100/S-200 may contain also portrayal for the data elements described in portrayal catalogue
* Product speficiations in S-100/S-200 domain follow the IHO guidance on S-100 development (IHO S-100 version 5 and IHO S-97 version 1.1)



1. Role of Specifications in VTS Digital Services Architecture

# DEFINITIONS

The definitions of terms used in this Guideline can be found in the *International Dictionary of Marine Aids to Navigation* (IALA dictionary) at <http://www.iala-aism.org/wiki/dictionary> and were checked as correct at the time of going to print. Where conflict arises, the IALA Dictionary should be considered as the authoritative source of definitions used in IALA documents.

# abbreviations

IHO International Hydrographical Organization

IMO International Maritime Organization

MASS Maritime Autonomous Surface Ship (As defined by IMO)

VTS System See definition in IALA Guideline G.1111