

Paper for Consideration by S-100WG4

S-100 Data Services via SMART Navigation Platform

Submitted by:	Republic of Korea (KHOA)
Executive Summary:	This paper introduces a plan of S-100 data services via the SMART Navigation Platform
Related Documents:	None
Related Projects:	KHOA S-100 Test Bed Project, Korea SMART e-Navigation Project

Introduction / Background

The Ministry of Oceans and Fisheries (MOF) of the ROK has been conducting the Korean e-Navigation project (hereafter referred to as the 'SMART Navigation') to reduce ship accidents and improve the efficiency of maritime transport. The main research topics of the project are the establishment of maritime communication network (LTE-M) and co-development of MCP (Maritime Connectivity Platform) with European e-Navigation Project teams in addition to the development of shore-based services considering the MSP (Maritime Service Portfolio) of e-Navigation.

KHOA planned to produce S-100 data based on S-10X product specifications developed by the IHO and provide those to non-SOLAS ships via the SMART Navigation Platform from 2021. This paper introduces the plan of S-100 data service and related research activities.

Analysis/DiscussionKorean e-Navigation (SMART Navigation) Project

According to the statistical report of the Korean Maritime Safety Tribunal, 73% of marine accidents occur in small ships less than 100 GT. ROK considers it necessary to make every effort to reduce ship accidents.

SMART Navigation project has been developing shore-based services, maritime communication network (LTE-M) and MCP to implement the concept of IMO's e-Navigation providing additional services for non-SOLAS ships such as fishing boats, coastal ships and ferries. Fig. 1 shows the overview and operational architecture of SMART Navigation project.

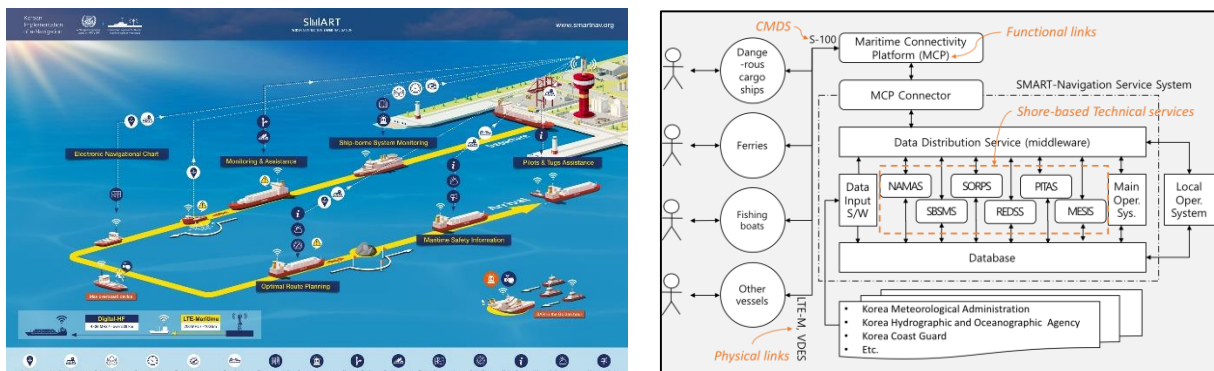


Fig. 1 Overview of Korean e-Navigation project (SMART Navigation)

Production and Service of S-100 data

KHOA has been making effort to produce the S-100 based test data for the S-10X products such as S-101 ENC, S-111 Surface Currents and S-122 MPA since 2017, and planned to service the S-100 hydro data through the MCP and maritime communication network (LTE-M) in line with the SMART Navigation project. The S-100 hydro data to be provided are as follows:

- S-101 Electronic Navigational Chart (ENC)
- S-102 Bathymetric Surface
- S-104 Water Level Information for Surface Navigation
- S-111 Surface Currents

- S-122 Marine Protected Areas (MPAs)
- S-123 Marine Radio Services
- S-124 Navigational Warnings
- S-127 Marine Traffic Management

The SMART Navigation project is planned to be serviced officially from 2021 so KHOA is willing to produce and distribute S-100 hydro data with the following schedules:

- (1) Preparation phase of S-100 hydro data
 - Production of S-100 data: From 2019 to 2020
 - Update of S-100 data: From 2021
- (2) Operational phase of S-100 data service
 - Pilot operation: 2020
 - Service operation: From 2021

ECS Standard and Related Regulations

In order to address potential issues for GPS plotter, which is the ECS in small ships, where it is unclear whether the chart is official and up-to-date, a national ECS standard is being developed within the SMART Navigation project

This ECS standard will also cover standardized symbols for any critical information on safe navigation and a minimum set of key functions such as safety alarms. The standard was developed with reference to relevant international documents for ECS – IEC 60945, IEC 62288, IEC 61174, IEC 61996-2, IEC 62376, IEC 6238 and RTCM standard 10900.6.

Moreover, it is expected that the ECS will be a main user system receiving the SMART Navigation services based on the Common Maritime Data Structure (CMD5), S-100 and S-10X Product Specifications. In addition, it will be considered as the optional means of transmitting marine information within the ECS standard.

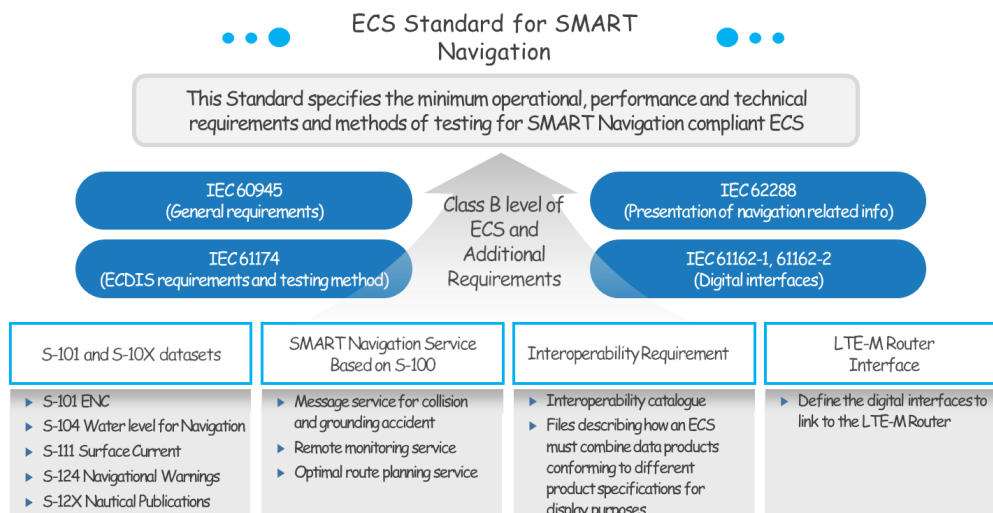


Fig. 2 ECS Standard for Non-SOLAS Ships

The MOF of the ROK is reviewing related national regulations in order to include the ECS standard similar to ECDIS and to ensure that the ECS would meet the carriage requirements on nautical charts and publications for non-SOLAS ships.

A Study of TDS and Symbol of S-101 ENC for Non-SOLAS ships

Since the ECS was expected as a main user system of SMART Navigation service, there was a requirement to prepare the S-100 TDS and presentation library for simplified certification process of the ECS. Accordingly, KHOA will draft the S-100 TDS and portrayal catalogue to support the ECS certification as a navigation system on-board in the SMART Navigation project.

Regarding the portrayal catalogue of S-101 ENC, KHOA has been carrying out S-101 Portrayal Harmonization Project for non-SOLAS ships since 2018. This issue will be discussed in another KHOA paper.

Conclusions

The MOF of the ROK has been conducting the SMART Navigation project to reduce ship accidents and improve the efficiency of maritime transport. In this regard, KHOA will produce S-100 data from 2019 to 2020 and provide those data to non-SOLAS ships via MCP and maritime communication network (LTE-M) developed by SMART Navigation project.

Recommendations

In order to support the certification process of the ECS as a main user system of SMART Navigation service, KHOA will draft the S-100 TDS and portrayal catalogue in the research project of this year and try to improve S-101 symbols for non-SOLAS ships.

KHOA hopes to share the progress and results at the next S-100WG meeting if invited. Member States or industries, who are interested in KHOA project, are invited to leave any comments.

Action Required of S-100WG

The S-100WG4 is invited to:

- a. **Note** this paper