

Paper for Consideration by NIPWG

[NPUB Service Development in the SMART Navigation Project]

Submitted by:	Republic of Korea (KRISO)
Executive Summary:	This paper introduces the status of NPUB service development in the SMART Navigation Project.
Related Documents:	SNPWG17-18.1 Research on MPA Dataset needed for Development of S-100 enabled ECDIS
Related Projects:	SMART Navigation Project

Introduction / Background

ROK has applied the MPA TDS to the S-100 GML-formatted test data set in the next-generation navigation support system development project based on S-100 standards, and the results were presented in SNPWG17 held in Rostock in 2014. The SMART Navigation Project was launched to conduct the IMO e-Navigation Strategy Implementation Plan (SIP), and the development of the MSP11(Maritime Service Portfolio about nautical chart service) was included in the service development plan. This paper is a report of the NPUB Service development in the SMART Navigation Project and S-122 MPA data service prototype.

Analysis/Discussion

Overview of SMART Navigation Project

ROK launched the SMART Navigation project in mid-2016 with a four and a half year plan to reduce marine accidents and increase marine port efficiency. The SMART Navigation service is under study to develop Activity 1 service development, Activity 2 communication and operational infrastructure, Activity 3 marine data and maritime cloud standard for land based service development. The SMART Navigation operating system on the ground operates six types of services, and is requested and provided through the Maritime Connectivity Platform (MCP). At sea, service requests and utilization are provided through ECDIS, ECS, and Mobile Device. The data provided by the SMART Navigation operating system is supplied as S-100 data, and data is processed and expressed according to the S-100 portrayal process on ECDIS, ECS and another devices.

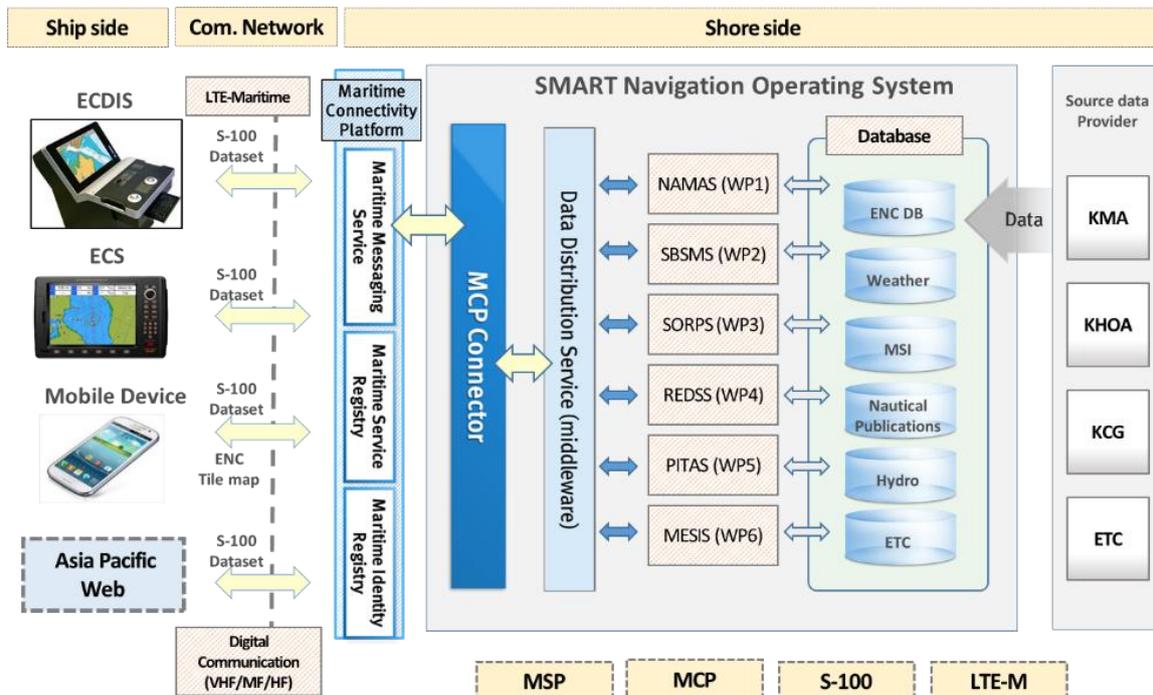


Fig. 1 SMART Navigation Service Overview

The services under development in the SMART Navigation Project are divided into WP1 ~ WP6 as follows.

1. WP1: Navigation Monitoring & Assistance Service (NAMAS)
 - NAMAS monitors navigation of vulnerable ships and gives alarm for navigation assistance to prevent collision and grounding. It uses positional information of ships and their route information when available. LTE-Maritime and VDES/D-HF are being considered as physical communication links for NAMAS
2. WP2: Ship-borne System Monitoring Service(SBSMS)
 - SBSMS monitors on-board systems of passenger ships with Korean flag and other ships requesting the service to detect hazardous events within the ships such as flooding, fire and engine failure. LTE-Maritime and VDES/SAT are being considered as physical communication links for SBSMS but not limited to these.
3. WP3: Safe & Optimal Route Planning Service (SORPS)
 - SORPS provides safe and optimal routes plan when requested. It can be used for voyage planning by merchant ships or for emergency route guidance for small vessels without navigation-aid systems such as radar and AIS. LTE-Maritime and VDES/SAT are being considered as physical communication links for SORPS but not limited to these.
4. WP4: Real-time Electronic Navigational chart Distribution & Streaming Service (REDSS)
 - REDSS provides ENC of Korean waters for SOLAS and Non-SOLAS ships when requested. It supports streaming as well for small ships without on-board electronic chart system (ECS). Only LTE-Maritime is being considered as physical communication links for REDSS
5. WP5: Pilot & Tugs Assistance Service (PITAS)
 - PITAS supports pilotage by providing pilots and tugs with information needed for pilotage. Only LTE-Maritime is being considered as physical communication links for PITAS
6. WP6: Maritime Environment and Safety Information Service (MESIS)
 - MESIS provides maritime safety information (MSI) including navigational warning, weather information, hydrographic information and maritime environment information. LTE-Maritime and VDES/D-HF/SAT are being considered as physical communication links for MESIS but not limited to these. Other communication links available on-board of service requesting ship

Overview of NPUB Service

Fig. 2 is the service overview of the Maritime Environment and Safety Information Service (MESIS) of the SMART Navigation Project. MESIS develops services with MSI, NPUB, Weather, Marine environment and hydro data corresponding to IMO MSP5, MSP11, MSP14 and MSP15 Purpose.

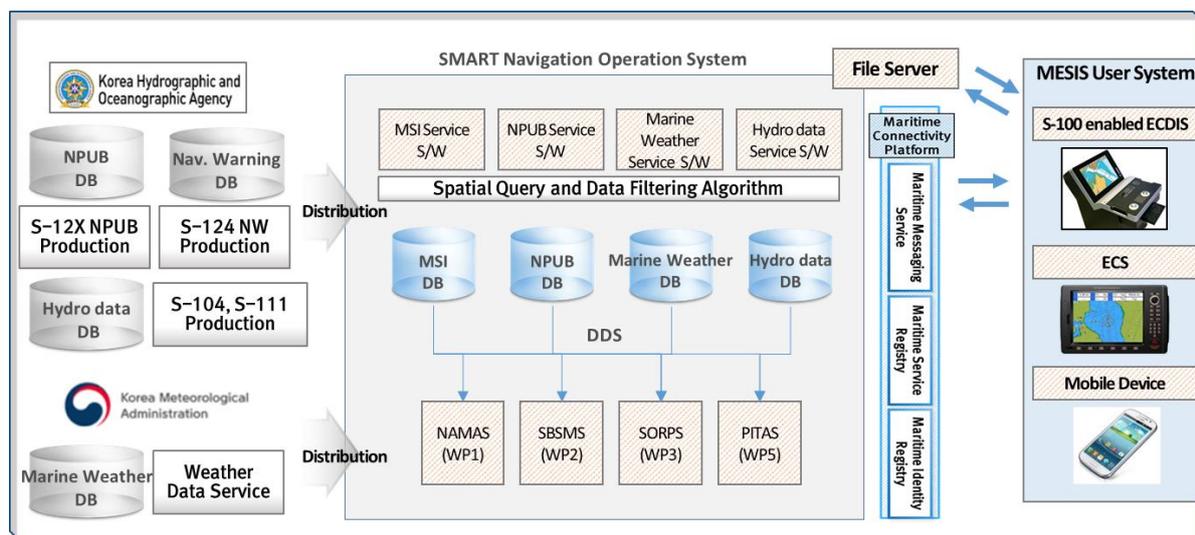


Fig. 2 MESIS Service Overview

KHOA is NPUB data publishing organization. If publishing NPUB data based on S-100 in the future, it can be used in ECDIS and ECS through MESIS service.

Result of S-122 MPA data service prototype

KRISO is promoting MESIS service development as SMART Navigation project leading agency. S-122 MPA data service prototype was developed for NPUB Service in 2017.

Note: FOR REASONS OF ECONOMY, DELEGATES ARE KINDLY REQUESTED TO BRING THEIR OWN COPIES OF THE DOCUMENTS TO THE MEETING

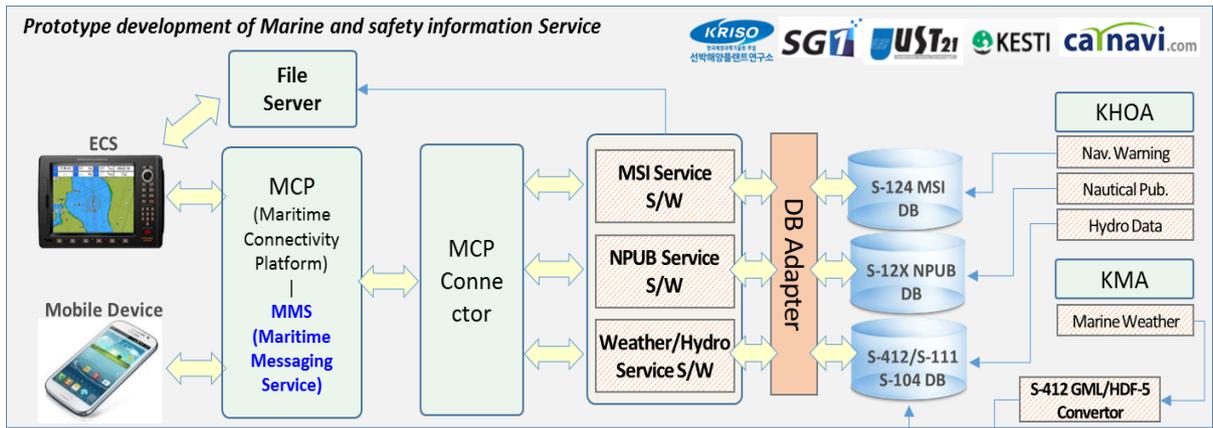


Fig. 3 Result of NPUB service prototype

S-122 MPA data service prototype conducted in 2017 was based on S-122 MPA PS which was submitted to NIPWG4, not the data provided by KHOA. The S-122 MPA data and QGIS loaded screen are shown in Fig. 4.

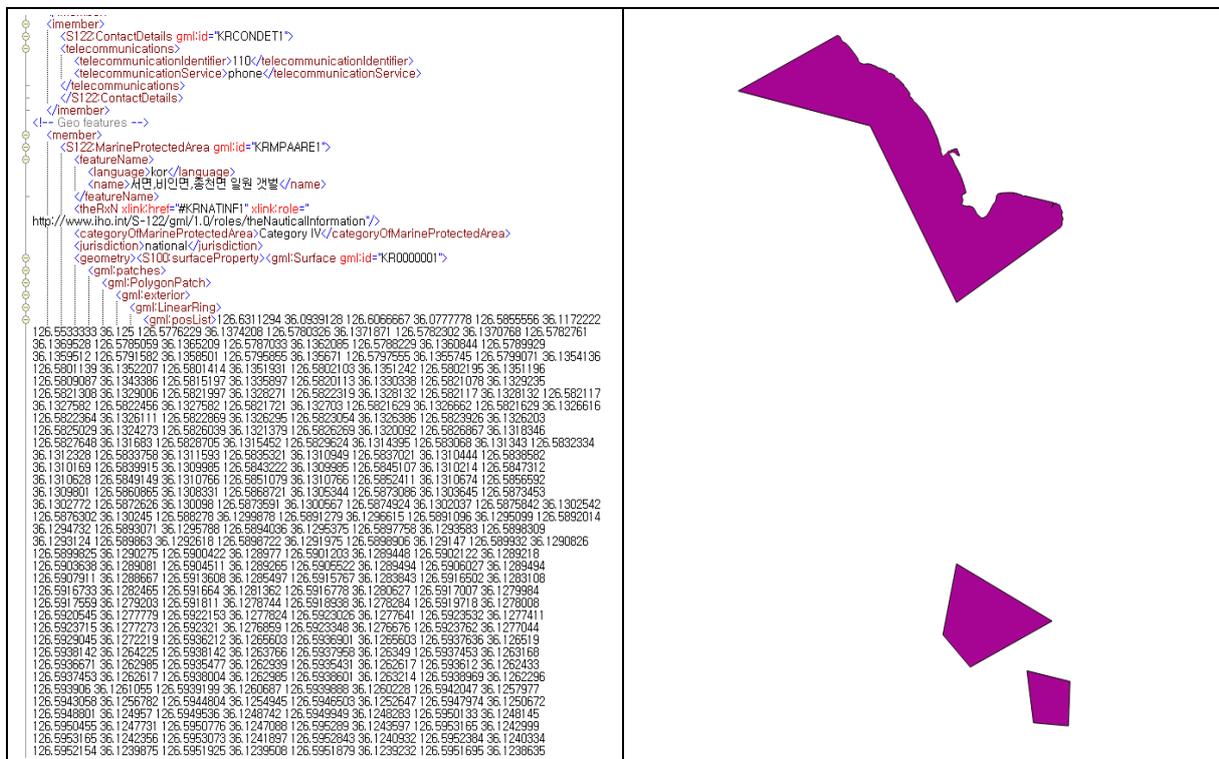


Fig. 4 Result of S-122 MPA TDS creation

Fig. 5 is a result of requesting S-122 MPA data through the MCP and then displaying the data on the mobile device after the SMART Navigation operation center provides the data through the file server.

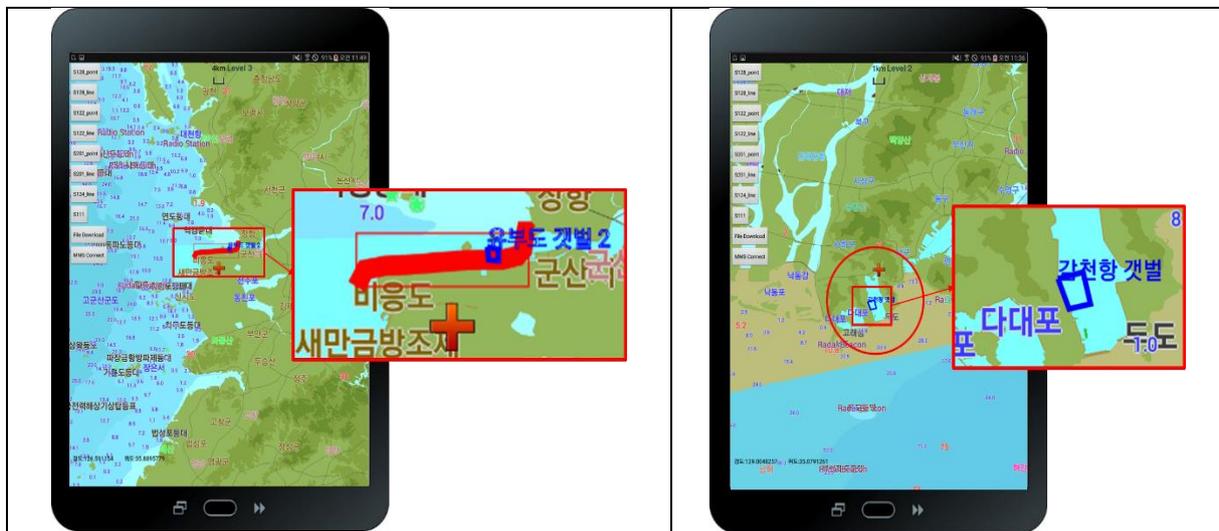


Fig. 5 MPA service to mobile device

Conclusions

ROK launched the SMART Navigation Project to conduct the IMO e-Navigation Strategy Implementation Plan (SIP), and NPUB Service is included in MESIS services. NPUB service prototype was developed in 2017 and TDS was created by S-122 MPA PS of NIPWG4 for 5 shore area of ROK.

S-123 MRS, S-128 Catalogue of nautical products, management and search function of metadata information using exchange set catalogue information, and application of portrayal features of NPUB data to mobile devices are scheduled in 2018 for the next research plan.

Action Required of NIPWG

The NIPWG5 is invited to:

- a. Note this paper.
- b. Support the NPUB Service development of SMART Navigation Project
- c. Decide on any future actions