

## Paper for Consideration by TSM8

### [KHOA S-100 Testbed and S-100P Project]

<b>Submitted by:</b>	Republic of Korea (KHOA)
<b>Executive Summary:</b>	This paper describes release plan of KHOA S-100 Viewer and plan of S-100P Project
<b>Related Documents:</b>	
<b>Related Projects:</b>	KHOA S-100 Test Bed Project

### Introduction / Background

The IHO is planning to transit to S-100 world by introducing S-100 Implementation Strategy. However, S-100 ecosystem is much more complex than S-57 to develop systems, produce datasets and utilize them with various different formats in order to meet its concept in due course. Moreover, the transition is not easy to accomplish alone.

The S-100 Open Online Platform (SOOP[su : p]) is the foundation of sharing and cooperation to facilitate changeover to the S-100 world with the vision and goals, as one of the alternative approaches to overcome challenges. The S-100P project was introduced to share S-100 related resources with IHO member states and stakeholders in an online system. According to the HSSC decision 12/13, KHOA would like to introduce the project including open source strategy of KHOA S-100 viewer and invite the IHO member states and expert contributors to join.

### Analysis/Discussion

#### 1. S-100 Open Online Platform Project

The primary goal of S-100 is to support a greater variety of hydrographic related digital data sources, products and customers. The S-100 Implementation Roadmap was introduced, but the development of the S-100 standard has been difficult for supporting various use cases as only a few S-100 experts and industry partners have been involved. The S-100P project was introduced for sharing and cooperation of S-100. The HSSC12 and 2nd assembly discussed the project.

#### The project vision

S-100 Open Online Platform is the foundation for S-100 World to accelerate wide adoption of the S-100 hydrographic framework by jointly developing and making freely available the building blocks required to overcome any technical S-100 implementation barriers.

#### Key goals of the project

- I. Share S-100 components, test datasets, and information required to construct an S-100 ecosystem
- II. Exchange experience and best practice results with S-100 production processes for data producers
- III. Enhance navigation, discovery and search of S-100 standards and technical guidelines for stakeholders
- IV. Promote development of open-source software and application models to implement the S-100 World
- V. Publicize the benefits and effects of the transition to the S-100 World

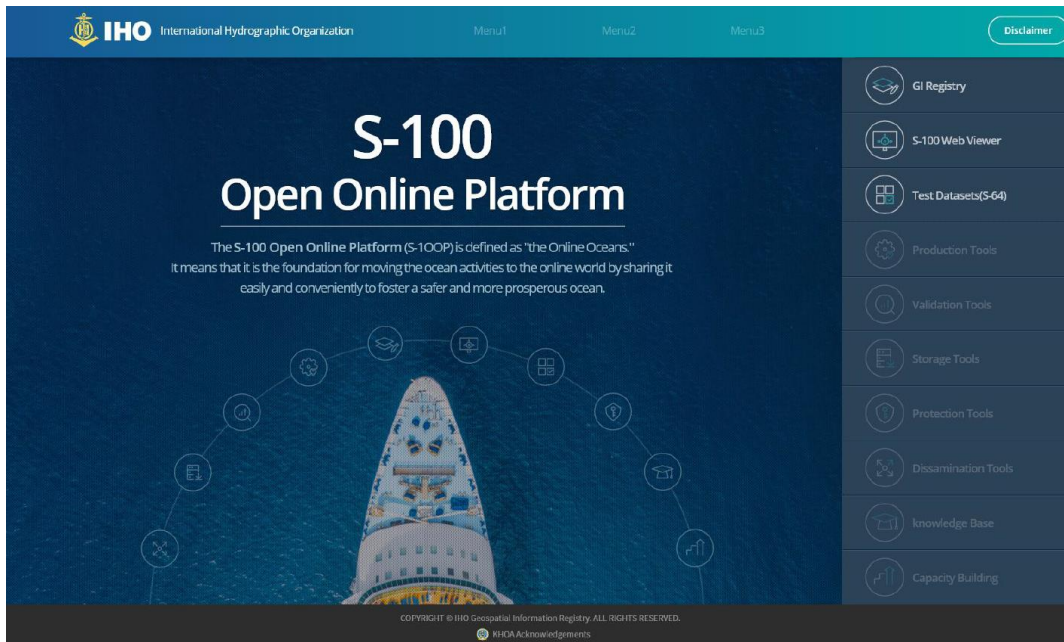


Figure 1 S-100P (Open Online Platform)

### Building blocks

Building blocks required for achieving the vision and goals of S-100P are shown in Table 1 and Figure 1. However, these may be refined with experience, project conditions or requirements from stakeholders. Building blocks are technical resources, resource sharing infrastructure, open source software tools, technical guidelines and reference materials that would allow any organizations to achieve S-100 operational capability quickly and efficiently.



Figure 2 Building blocks diagram (Source: IIC Technologies)

Table 1 List of building blocks

No.	Title	Description	remarks
1	GI Registry	S-100 Geospatial Information Registry contains several registers (online databases) that include items of information that are relevant to those communities developing S-100 based products and services. (S100.iho.int)	
2	Test Datasets	Datasets created for testing purpose aimed at validating various aspects of dataset creating, validation, dissemination, portrayal and updating.	
3	Production Tools	Tools, generally software, designed to produce one or more data products that comply with certain standards.	
4	Validation Tools	Tools, generally software, designed validate the degree of compliance of a data product to one or more standard.	
5	Storage Tools	Tools, generally software, designed to store data products for various purposes, such as archive, verification and dissemination.	
6	Protection Tools	Tools, generally software, designed to apply certain data protection measures, like digital signature and encryption.	
7	Data viewer	Software designed to portray data products.	
8	Dissemination Tools	Tools, generally software, designed to aid in making data products available to users.	
9	Knowledge Base	A store of information or data that is available to draw on for highlighting the underlying set of facts, assumptions, and rules which a computer system has available to solve a problem	
10	Capacity Building	The process by which the S-100P assesses and assists in sustainable development of the Member States, other states and stakeholders to acquire the knowledge, skills and means to adopt to the S-100 World.	

Joint development of open source based S-100 Viewer

In order to activate S-100 implementation, it is believed the open source strategy of S-100 Viewer will support the development of navigation system and various applications without technical barriers for the IHO member states and stakeholders. As KHOA reported at HSSC12, the source of KHOA S-100 Viewer will be released by modules over three phases as below.

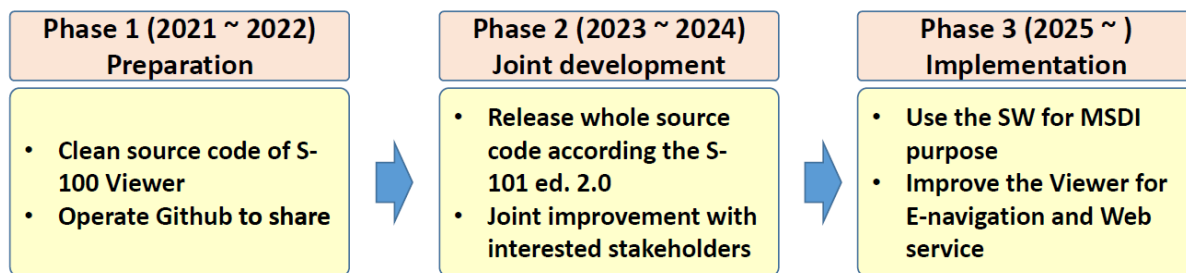


Figure 3 Joint development of open source viewer

Phase 1 aims to clean up the source code of KHOA S-100 Viewer that can be used for each functional module. In particular, it is planned to open a module for the S-101 8211 format in 2021, then a module for other S-1xx H-5, GML format in 2022, subsequently.

After Phase 1 is carried out by KHOA, the second Phase will be a joint development stage in which interested member states and stakeholders participate. Phase 2 aims to include technical issues that meet all the requirements of the S-101 2.0 through joint development.

Phase 3 is a step which the S-100 Viewer is used for MSDI (Marine Spatial Data Infrastructure) purposes or for e-Navigation, web services, etc. The stage is expected to advance the concept and details of joint development according to the development of S-100.

The source of the Viewer will be shared through Github for joint development in terms of promoting the development of open-source software. Figure 4 describes the components of S-100 Viewer. The viewer is divided into a number of modules such as machine-readable standard (FC), dataset, portrayal process and rendering device command. Each part will be developed to be used individually and when all parts are connected, it becomes whole packaged S-100 Viewer, and S-1xx data and FC/PC can be tested/viewed. It is requested for interested member states and industries to participate for further development.

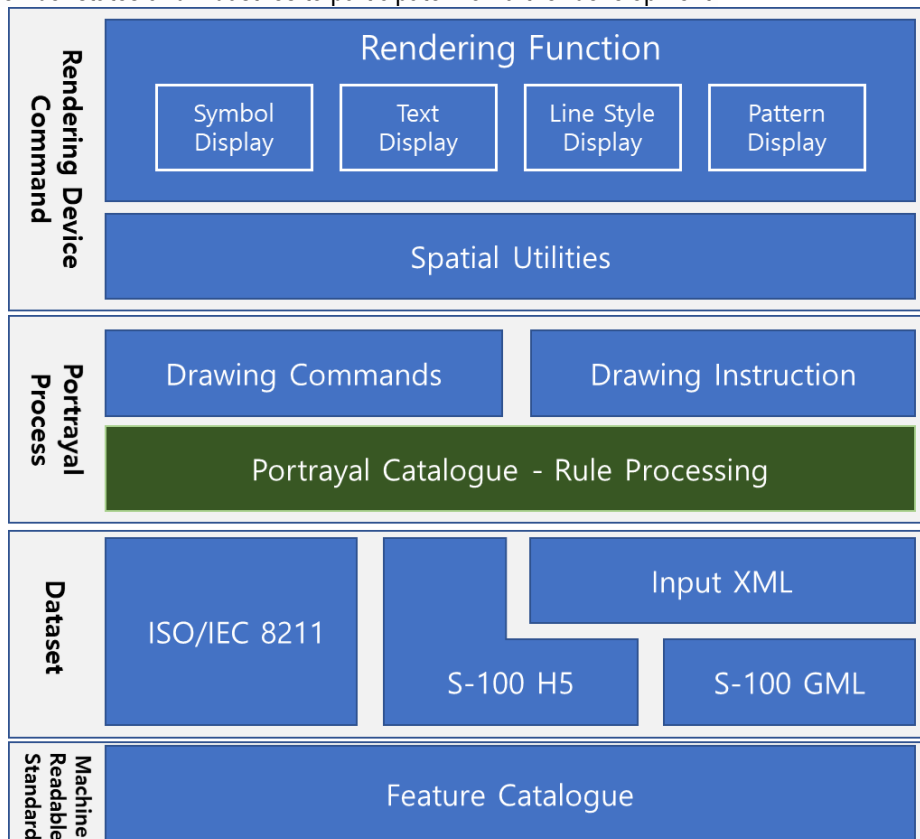


Figure 4 Components of S-100 Viewer

## 2. Update KHOA S-100 Viewer and release plan

The KHOA S-100 viewer supports the following seven S-1xx products.

- S-101 ENC, S-102 Bathymetric surface, S-111 Surface current, S-122 MPA, S-123 MRS, S-124 NW, S-127 MTM

KHOA S-100 Viewer S/W installation package and user manual will be released on Github and GI Registry with some TDS and FC/PCs for running a trial. KHOA S-100 Viewer v.1.0. is able to display your S-1xx datasets and check attribute queries.

We hope that the release will support the development of product specifications, TDS creation and IHO member states' preparation regarding the IHO S-100 Implementation Strategy. Additionally, KHOA would like to have feedbacks from Member states if they find any bugs or improvement ideas to make it better.

The Viewer includes editing functions for TDS (8211, GML) in addition to testing TDS and FC/PC. The function is limited to adding feature data and editing attribute values according to feature catalogue, and does not support complex spatial editing functions yet. It is considered to provide the viewer in two; a simple viewer and a viewer with editing functions.

The editing function supports making minor changes to S-10X TDS. KHOA would like to request TSM to find the needs of viewer with editing functions. If it is agreed, it will be released in the second half of this year through Basecamp and GI registry.

## **Conclusions**

KHOA will release KHOA S-100 Viewer on the Basecamp and Github on May 1<sup>st</sup> 2021. The viewer will be updated 1-2 times a year considering the latest discussion results from the WGs and relevant discussions.

The S-100P project is for IHO Member States and relevant stakeholders, but is not limited to the hydrographic community. In order to achieve its vision and goals, it is required to establish a group with contributors and supporters. The group will be developing the overall concept of S-100P and its each building block including the development of open-source software.

## **Recommendations**

- a. To discuss the release of S-100 Viewer with editing functions.
- b. To find active participations from interested Member states, experts and industry partners on S-100P development.

## **Action Required of TSM**

The TSM is invited to:

- a. Note this paper
- b. Agree on KHOA S-100 Viewer release plan and open source strategy
- c. Provide feedbacks on KHOA S-100 Viewer v.1.0.
- d. Discuss organising a sub-group for S-100P project under S-100WG