

Paper for Consideration by S-100 TSM

[S-100 Sea trial of KHOA]

<b>Submitted by:</b>	Rep. of Korea (KHOA)
<b>Executive Summary:</b>	This paper describes S-100 sea trial of KHOA which was conducted to check S-100 datasets and test a prototype S-100-based Electronic Chart Display and Information System (ECDIS)
<b>Related Documents:</b>	S-100 4.0, S-101 1.0, etc.
<b>Related Projects:</b>	IHO S-100 testbed project, KHOA S-100 testbed project



**Introduction / Background**

KHOA has been conducting the S-100 test bed project to support IHO test bed project and cope with the implementation of S-100 based product specifications. S-100 sea trial was held to check S-100 dataset and prototype the ECDIS.


**Analysis/Discussion**

Overview of Sea trial

On August 27, Experts from the United States (NOAA), the United Kingdom Hydrographic Office, and the Canadian Hydrographic Service participated in the S-100 sea trial in Busan, Republic of Korea. The sea trial was conducted from 9 am to 4 pm. The test route was between Port Busan and Geoje Island.

	
<p>International team participating in the S-100 sea trial.</p>	<p>Testing Route</p>

The trial took place on the KHOA Survey Vessel Haeyang2000 and the detailed specification is like below;

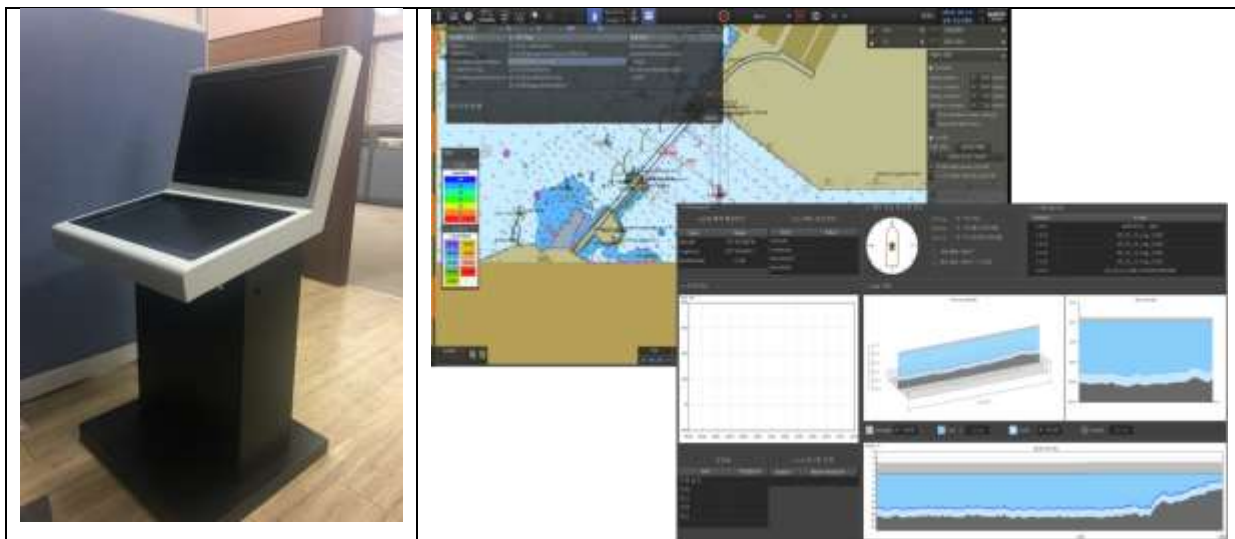
Name	Specification	Image
<p>Haeyang2000</p>	<p>Total tonnage: 2,161                      Length: 89.2 m                      Width: 14.0m                      Engine: 3,020HP X 2                      Cruising distance: 14,000mile</p>	

### S-100 Test dataset and prototype ECDIS

The list of S-100 test dataset is like the followings. Some of the data like S-412 was from Korean e-Navigation project.

- 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
- S-123 Marine Radio Services
- S-124 Navigational Warnings
- S-127 Marine Traffic Management
- S-129 Under Keel Clearance Management (UKCM)
- S-412 JCOMM Weather Overlay (From SMART Navigation Project)

KHOA has been developing the prototype ECDIS that is capable of ingesting and displaying the S-100 based test dataset



### Test scenarios

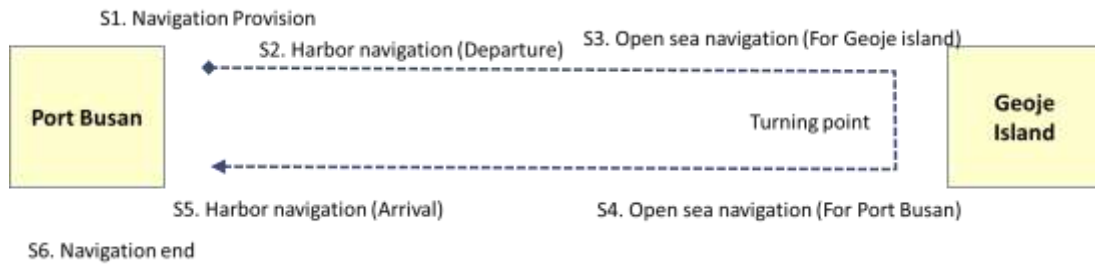
IALA developed a guideline of planning and reporting e-Navigation testbeds, which includes examples of factors to be taken into account when planning test and test cases. The team identified below test considering the IALA guideline.

- Test 01 : S-100 Interoperability Catalogue
- Test 02 : Portrayal Issues including S-101 and S-10X data
- Test 03 : Display of Quality Information
- Test 04 : Under keel clearance management (UKCM)
- Test 05 : Application of e-Navigation service data (S-124 and S-412)
- Test 06 : Concept of Bridge procedure
- Test 07 : Concept of Front/Back bridge

Each test can be checked according to the overall scenario. The scenario consisted of 6 parts like below.

- S1. Navigation provision
- S2. Harbor navigation (Departure)
- S3. Open sea navigation (for Geoje island)
- S4. Open sea navigation (for Port Busan)
- S5. Harbor navigation (Arrival)
- S6. Navigation end

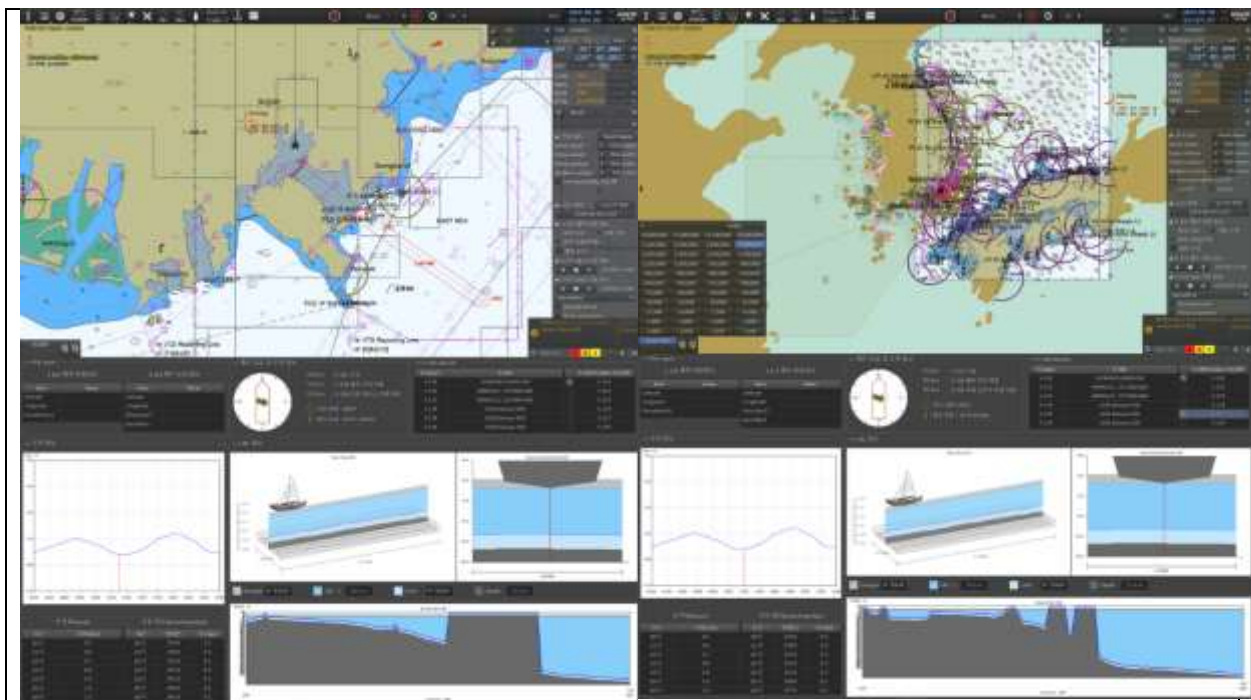
The ship left the Port of Busan in the morning, transited to Geoje Island, and returned in the afternoon.



### Major outputs

During the route, test scenarios were run in order to see 1) how the system portrayed the different types of datasets in an integrated fashion, and 2) how the high resolution bathymetry layer can be leveraged to provide a better-calculated safety contour and portray go/no-go situations based on underkeel clearance management data. Major outputs of S-100 sea trial is like below;

- Some data may not to be displayed on the front-of-bridge navigation system
- The need for a harmonized portrayal of the data within the navigation system
- If each portrayal of the product is developed in isolation, there is too much information in screen
- Increased collaboration across the IHO working groups is required



The test result of the S-100 interoperability catalogue, Portrayal issues of S-101 and Display of Quality information was submitted to TSM7 in a separate document.

### **Conclusions**

KHOA conducted S-100 sea trial involving international experts of S-100. The test data and prototype ECDIS was developed and test scenario was prepared. From the various tests, invited experts provided recommendations on the interoperability and harmonized portrayal.

### **Action Required of TSM**

The TSM7 is invited to:

- a. note this document
- b. discuss the issues raised in this document