

## Paper for Consideration by S-100WG4

## Ship simulator based S-100 Test System

<b>Submitted by:</b>	Republic of Korea (KHOA)
<b>Executive Summary:</b>	This paper describes the ship simulator based test system for S-100 data
<b>Related Documents:</b>	S-100 Test Strategy Plan
<b>Related Projects:</b>	KHOA S-100 Test Bed Project

**Introduction / Background**

KHOA has been developing the S-100 Simple Viewer and S-100 Test System (shore-based ECDIS) to support the IHO S-100 Test Framework and verify the quality and usability of S-100 data.

Also, KHOA has been establishing the ship simulator based S-100 test system to verify the S-100 data such as S-101 ENC and S-111 Surface Currents in an environment similar to a ship bridge.

This paper introduces the main results of prototype development in 2018 and seeks advices from experts.

**Analysis**S-100 Simple Viewer and Test System of KHOA

KHOA developed the S-100 Simple Viewer to support the IHO Test Framework. The S-100 Simple Viewer aims to verify feature/portrayal catalogue created by S-100 registry and catalogue builders and S-101 data converted by S-101 Converter.

KHOA developed the S-100 test system (shore-based ECDIS) by combining the KHOA S-100 Simple Viewer and ECDIS SW. KHOA research team performed three sea trials between 2016 and 2017. (Reference [S-100WG3-8.1](#), [TSM5-6.5](#), S-100WG2-10.15)

Development of Ship Simulator Based S-100 Test System

KHOA decided to develop the ship simulator based S-100 test system in order to verify the S-100 data in an environment similar to a ship bridge. A prototype system was developed combining S-100 test system and ship handling simulator which is also equipped with the S-57 ENC available ECDIS.

Fig. 1 shows the overview of ship simulator based S-100 test system. The S-100 data is stored in the TDS management system. The data to be tested is packaged by S-100 Exchange set and applied to the S-100 test system. The ship simulator and S-100 test system is connected and the S-100 data can be tested in the screen of S-100 test system depending on the manipulation of the ship simulator.

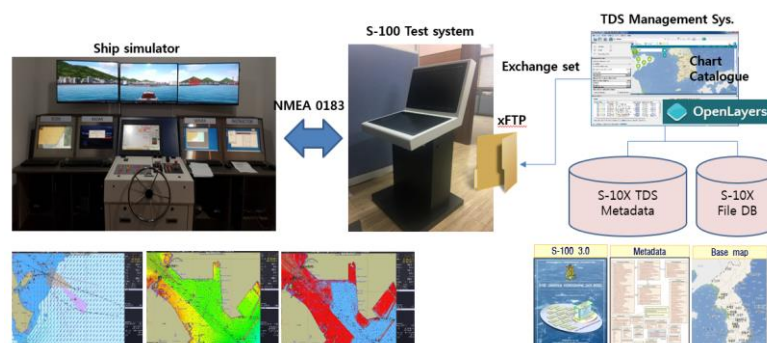


Fig. 1 Overview of ship simulator based S-100 test system

The left side of Fig. 2 shows prototype of ship simulator based S-100 test system which consists of ship handling simulator, S-100 test system and TDS management system. The right side of Fig. 2 shows screen shots of S-100 test system which indicate chart screen part and additional information part.

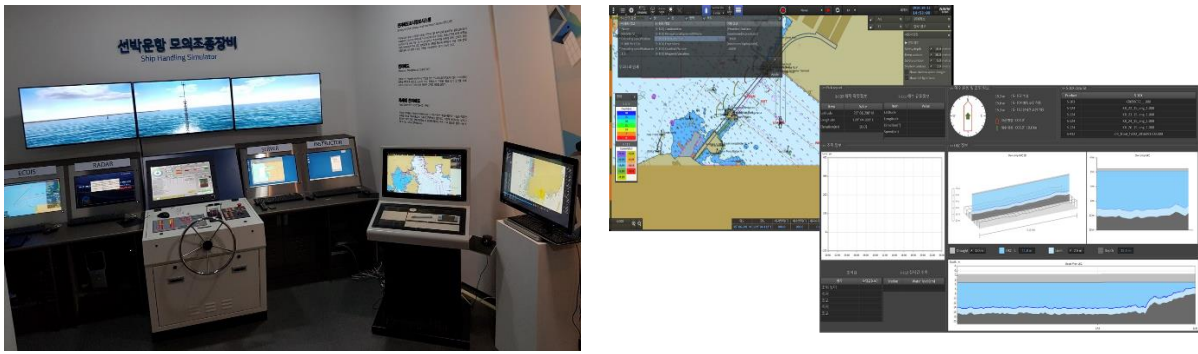


Fig. 2 Prototype Development of Ship Simulator Based S-100 Test System

## Discussion

KHOA found out that the ship simulator based test was more beneficial than sea trial test due to the points below:

- 1) Efficient communication with various stakeholders such as mariners, data producers and OEM developers
- 2) More practical test in terms of usability view using the ship simulator based S-100 test system (Shore based ECDIS) compared to the S-100 Simple Viewer
- 3) Improved efficiency in terms of time and cost compared to sea trial tests

KHOA will develop the ship simulator based S-100 test system in 2019 based on the lessons learned from the prototype development and verify S-100 test data and S-100 test system with domestic and international experts.

## Conclusions

KHOA decided to establish the ship simulator based S-100 test system for the purpose of verifying S-100 test in an environment similar to a ship bridge and developed prototype system in 2018. In this year, a real system will be developed and tested. KHOA plans to provide S-100 data via SMART Navigation platform which consists of MCP and LTE-M. Accordingly, the ship simulator based S-100 test system will be developed to check the quality and usability of S-100 data indoor. KHOA is also planning periodic sea trials.

The testing results by the S-100 test system will be reported to the next S-100WG meeting.

## Recommendations

KHOA seeks interested experts' advice on the plan of testing S-100 data by ship simulator based S-100 test system indoor and sea trial using the S-100 test system for the purpose of testing harmonized integration and display of S-100 data.

## Action Required of S-100WG

- The S-100WG4 is invited to:
- a. **Note** this paper.