Paper for Consideration by S-100WG4

Ship simulator based S-100 Test System

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<th>Submitted by:</th>
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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, TSM6-6.5, 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.

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.
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.