

Paper for Consideration by [Council meeting]

[S-100 Testbed project in 2022]

Submitted by:	KHOA (Republic of Korea)
Executive Summary:	By using the S-100 Testbed, this paper reports the technical details such as S-98/Dual Fuel concept/S-128 implementation and quantitative analysis results for the use of S-100 based product service.
Related Documents:	Roadmap for the S-100 Implementation Decade (2020–2030) C5-07.6A INF - KHOA (ROK) & NOAA (US) Information on S-100 Testbed Project, Decisions and Actions C5/60
Related Projects:	S-100 Testbed project of KHOA

Introduction / Background

1. The 5th IHO Council meeting noted the approach proposed by the S-100 Testbed project to quantitatively measure the efficiency of using the S-100 based product service. The Council invited the Member States to join the project and suggested other qualitative measures such as safety of navigation and efficiency as appropriate.

Analysis/Discussion

S-100 Testbed plan of KHOA

2. In consideration of the requirements for the S-100 development and Decision C5/60, KHOA tested the technical details of S-100 and the utilities and economic efficiency of the S-100 data service.

Technical issues of S-100 (planned)

3. The S-98 interoperability is essential for the integrated operation and harmonized display of S-10x data. The S-98 Edition 1.0.0 was released for testing purposes on May 2022. Meanwhile, for the stable implementation of the S-10X product specifications, a Dual Fuel governance document has been published, and a technical guideline for Dual Fuel mode will be prepared.
4. The technical issues of S-100 are composed of the application of the S-98 interoperability catalogue, which is the core of the S-100 implementation roadmap, the Dual Fuel concept, and the up-to-dateness of navigation products using S-128 Catalogue of Nautical Products.
5. In order to test the technical details of the S-100 data service, we will attempt the functions of a new S-100 ECDIS to enable the Dual Fuel mode concept, and up-to-dateness with using the S-128 dataset while meeting the latest edition of S-10X product specifications.
6. Detailed test procedures and results will be updated on this paper when we complete the test in September 2022.

Utility test of S-100 service (planned)

7. On the assumption that the amount of the distributed information to a mariner is 100, we compare the information that the mariner uses with S-57 ECDIS and other navigation purpose materials versus S-100 ECDIS to measure how much the usability of information increases.
8. The usability test quantitatively measures the improvement effect, advantage and utility that we expect using the S-100 data service from the user's perspective. The research team evaluated the utility/usability from the user's point of view using the S-100 data service in the marine environment.
9. We will try to quantitatively measure the improvement effect of using the S-100 data service compared to current nautical products for navigation provision and route planning. In addition, we will analyse detailed tasks of the provisional work conducted by mariners and the performance time/fatigue of each task that mariners have using an eye tracker equipment.

10. According to the marine accident report by the Korean government, 86% of the accidents occurred in coastal areas (territorial sea) for the last five years. As for the cause of accidents, about 45% are collisions, shipwrecks, and capsizing which are considered to be human-affected. Therefore, we expect that digitalization and automation through the increase of machine-readability with S-100 based product services can reduce the probability of human errors, and this will allow us to navigate safer.
11. Detailed test procedures and results will be updated on this paper when we complete the test in September 2022.

Efficiency test of S-100 data service (planned)

12. The efficiency test is a quantitative evaluation of the economic feasibility of using S-100 data services in a ship's operating environment. By applying dynamic and time-varying products, the optimal scenario to understand the economics of operation will be derived, and economic efficiency will be measured through a ship handling simulator or simulation operation program based on S-10X datasets.
13. Detailed test procedures and test results will be updated on this paper when the test is completed in September 2022.

Conclusions

14. This document only describes the test plan, which will be updated in September when it is done. KHOA would like to invite interested Member States to participate in the technical test and the evaluation of the usability and efficiency of S-100 data services.

Action required of [Council meeting]

The [Council meeting] is invited to:

- a. note the results of the S-100 Testbed project conducted by KHOA in 2022.
- b. invite Member States to participate in the S-100 Testbed.