Paper for Consideration by HSSC

ROK-US S-100 testbed framework on advancement of S-98 Interoperability Catalogue, S-164 TDS

Submitted by:	Republic of Korea(KHOA), USA(NOAA)
Executive Summary:	Summary of progress made through the JPA Project framework
Related Documents:	S-100WG5 Interoperability progress, S-98 Annex C
Related Projects:	S-100 ECDIS, KHOA S-100 Viewer, S-98 Interoperability realisation, S-164

Introduction / Background
During 2020 and 2021 ROK-US S-100 test bed, together with a number of partner organisations (IIC Technologies, PROST, and KRISO) have progressed some key elements of S-100 implementation. This paper details some of the key advancements made this year, such as an advancement of S-98 Interoperability Catalogue which complements the test version KHOA S-100 editor. With the progress in S-100 rollout during 2020 and 2021 these developments address some of the key bottlenecks relating to S-100's maturity and, ultimately, the use of S-100 for primary navigation.

Analysis/Discussion
The test bed items of particular note comprise:
1. Advancements with the S-98 interoperability framework and implementation for key S-100 product specifications
2. Development of a framework for the full implementation of S-164

S-98 interoperability.
In the ROK-US test bed, an analysis has been carried out defining use cases of multiple S-100 data products, drawing together a number of available documents determining how such products are used for primary navigation. Analysis for IMO Voyage Planning, Appraisal and Voyage monitoring were carried out. A comparison of features within each of the products and their different attribution has been done and the results used to define an initial interoperability catalogue. This interoperability catalogue can be used for initial testing of product specifications in an ECDIS portrayal context with the KHOA S-100 viewer. During the study, the draft of S-98 Annex C was used to formulate some of the portrayal elements, in particular the "interleaving" of different products under interoperability level 1. This provides portrayal such as that shown in the following image (S-101 ENC alongside S-127 Marine traffic Management).
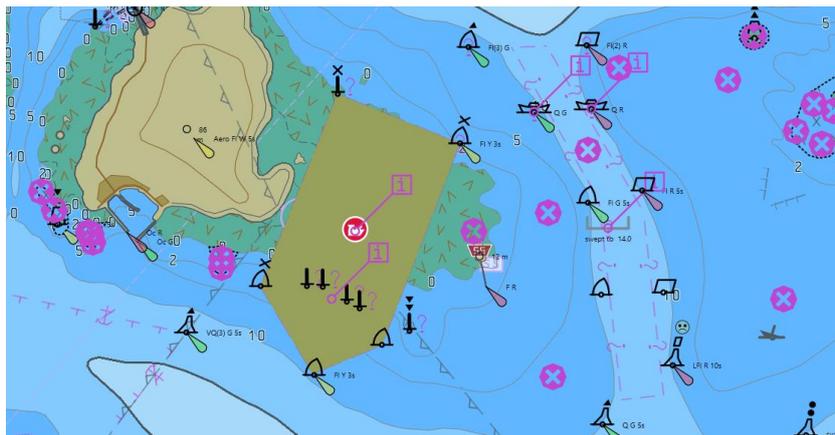
Figure 1: S-101 and S-127 using S-98 Interoperability (KHOA S-100 Editor prototype)

We have successfully accomplished an early stage of the interoperability catalogue which can be used as an initial version testing alongside the KHOA S-100 editor prototype

S-164 development.
The current S-64 is managed with a single large PDF test data manual with many embedded images and a complex set of test data files and associated instructions. The current edition of S-64 has a large number of users from outside the IHO community, mainly type approval bodies who use it to verify functionality of developed ECDIS. The enhancement of S-64 to the S-100 version "S-164" will require the extension of the testing scope to:

Note: FOR REASONS OF ECONOMY, DELEGATES ARE KINDLY REQUESTED TO BRING THEIR OWN COPIES OF THE DOCUMENTS TO THE MEETING

1. Multiple product specifications
2. New functionality including catalogue update, installation and maintenance
3. Functionality specifically associated with the Dual-Fuel concept for co-existence with S-57

To deal with this large increase in scope, and to broaden the utility of the S-64 testing concept, ROK-US S-100 test bed has considered how best to manage the core tests, datasets and verification images. Building on earlier work demonstrated to the S-100WG in 2020 a database model has been produced and Proof-Of-Concept implementation of the structure of the current S-64.
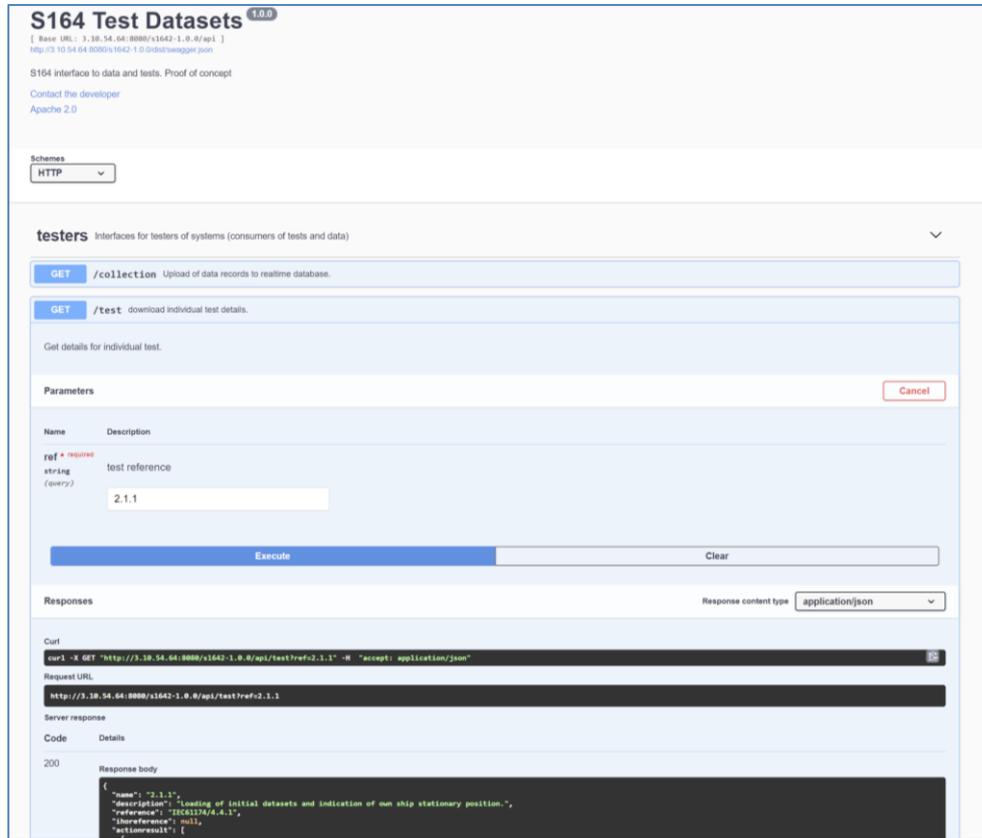

Figure 2: The S-164 API proof of concept

The proof of concept allows access via a structured API to a database containing digitised versions of the existing S-64 test datasets. The concept is to use the defined database structure to hold all S-164 tests for all categories, including a hierarchical organisation of tests and sections together with repositories of test datasets and verification images. Intelligent clients can be built to assist testers which access the database through the API and facilitate testing of S-100 ECDIS.

This architecture enables a far more manageable increase in the scope of S-64 to cope with the S-164 implementation, and allows for a cooperative approach to its definition. It also enables the building of clients to assist type approval agencies in accrediting S-100 ECDIS. The aim is to continue development of the Proof-Of-Concept by further population of the database, implementation of dataset and image repositories and simple clients to further demonstrate the advantages of the approach.

Action Required of HSSC
The HSSC is invited to:

a. Note the contents of this paper and the advancements made through the ROK-US S-100 test bed cooperation2020-2021

b. Note the focus on the key work items in the S-100 work plan of achieving S-98 interoperability catalogue and a sustainable framework capable of supporting full implementation of S-164.