Paper for Consideration by S100WG

Conversion of S-57 Test/Validation data to S-101

Submitted by:	IHO Secretariat (TP and HP)
Executive Summary:	This paper provides a summary overview of the current S-57 ENC test data sets associated with ENC validation, encryption / authentication and ECDIS type approval and portrayal. It is intended to provide a preliminary indication of what resources will be required to convert these datasets to S-101 ENC's.
Related Documents:	*S-57, S-58, S-63, S-64*
Related Projects:	*ENCWG*

Introduction / Background

S-101 Edition 1.0.0 was published in December 2018 for testing purposes. It is anticipated that Edition 2.0.0 should be sufficiently mature for datasets to be deployed. Before this can happen, S-101 ENC's and S-100 based ECDIS will have to undergo various checks and test to ensure that they are fit for use and conform to the relevant standards. Appropriate S-101 datasets will be required for these tests (as is the case for S-57).

Analysis/Discussion

There are many S-57 ENC datasets that have been developed for purposes such as data validation, data authentication/encryption, portrayal and ECDIS type approval. These datasets form part of different standards (e.g. S-52, S-58, S-64) which can be somewhat confusing to the uninitiated. Many of these datasets will have to be converted to S-101 ENCs. A summary list of these datasets is recorded below in order to provide an indication of what resources will be required for their conversion.
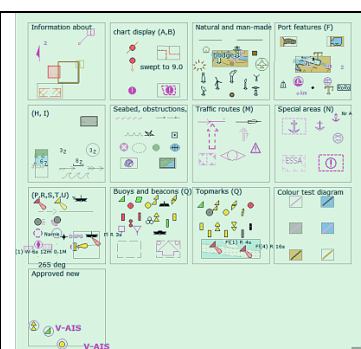
S-52 Specifications for Chart Content and Display Aspects of ECDIS (Ed. 6.1(.1))

S-52 documents how an ENC should be portrayed on an ECDIS screen. Annex A - IHO ECDIS Presentation Library (Edition 4.0(.2)) includes "**Chart 1**" datasets which are intended for the ECDIS user to compare his ECDIS display against graphical plots. Conversion of the Chart 1 datasets to S-101 should be a fairly easy task.

Chart 1 data sets comprise;
 - ENC .000 (including update) files = **14**
 - CATALOG.031 files = **1**
 - Text files (.txt) = **1**

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S-58 ENC Validation Checks

S-58 was previously included as Appendix B1, Annex C of S-57 Edition 3.1. It specifies the checks that, at a minimum, producers of ENC validation tools should include in their validation software. Validation tools are used by hydrographic offices to help ensure that their ENC data are compliant with the S-57, Appendix B1 ENC Product Specification.

S-58 ENC Validation Checks
Critical Checks Test Cases
  - ENC .000 (including update) cells = **112 (74 base cells)**
  - CATALOG.031 files = **70**
  - Text files (.txt) = **82**
 	
Cell AA400002.000	

S-63 - Data Protection Scheme

S-63 describes the recommended standard for the protection of ENC information. OEMs must self-verify and validate their ECDIS applications using the S-63 test data sets. Primar has commenced work on producing S-100 compliant permit, certificate and public/private key files. There will also be a requirement to convert the S-57 files to S-101.

S-63 ENC Validation Checks
Critical Checks Test Cases
  - ENC .000 files = 72 cells (**42 base cells)**
  - CATALOG.031 files = **11**
  - Text files (.txt) = **50**
  - Permit files (.pmt) = **14**
 	
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S-64 - IHO Test Data Sets for ECDIS

The S-64 and its associated test data sets have been produced to fulfil the requirement for all ECDIS testing as outlined in the IEC 61174 standard (Operational and performance requirements, methods of testing and required test results). IEC 61174 is based on the performance standards of IMO resolution MSC.232(82), and is also associated with IMO resolution A.694(17) and IEC 60945.

The S-64 test data sets contain both encrypted and unencrypted ENC cells and Raster Navigational Charts (RNC) data. An overview of the datasets is provided below.

Name	..
S-64_e3.0.2_ENC_Encrypted_TDS	3 522 files in 1755 folders
S-64_e3.0.2_ENC_Unencrypted_TDS	129 files in 69 folders
S-64_e3.0.2_RNC_TDS	? - RNC files not required for S-101

Encrypted TDS
  - ENC (including update) files = **1 696**
  - CATALOG.031 files = **66**
  - Text files (.txt) = **1 587**

Unencrypted TDS
  - ENC (including update) files = **54**
  - CATALOG.031 files = **32**
  - Text files = **35**

GB4X0000.000

Actions Requested

The S-100WG is invited to note that, before S-100 based ECDIS and S-101 ENCs can be used operationally, there will be a requirement for systems to be type approved and for ENC data sets to be validated and tested. This will require test datasets, most of which can be based on the datasets presented above. The conversion of the datasets will require considerable resources, and the S-100WG is invited to consider;
 - which of the datasets should be converted;
 - how their conversion will be resourced;
 - how they will be incorporated into the S-100 suite of documentation.

It is proposed that these datasets should also be considered for use in future of test bed projects.