

Paper for Consideration by S-100WG1: Status of United States S-100 Testbed Software

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| Submitted by: | SPAWAR Atlantic |
| Executive Summary: | Status update and technical discussion of the progress of United States S-100 Testbed Software |
| Related Documents: | S-100 S-101 TSMAD28 11.2A TSMAD29 11.5B TSM3-3.6B |
| Related Projects: | KHOA S-100 Testbed Project |

Introduction

As first presented at TSMAD 28, with subsequent status updates at TSMAD 29 and the TSM3 meeting this past September 2015, this paper presents a status update to the United States development of the S-100 Testbed software. A thorough background explanation of the international, national and technical rationale for this development effort was presented in all the previous papers; most recently TSM3-3.6B. In previous technical papers submitted, we neglected to use a consistent naming convention for this software product, as it has been in the research and development phase in parallel with the accompanying standards/specifications development efforts. From this point forward, we have labeled this first deliverable the "S-100 Viewer" software, and will use this term in future technical papers.

The S-100 Viewer software represents Phase 3A "Simple Viewer" of the S-100 System Overview in Figure 1 below, and currently works with ISO 8211 encoded data.

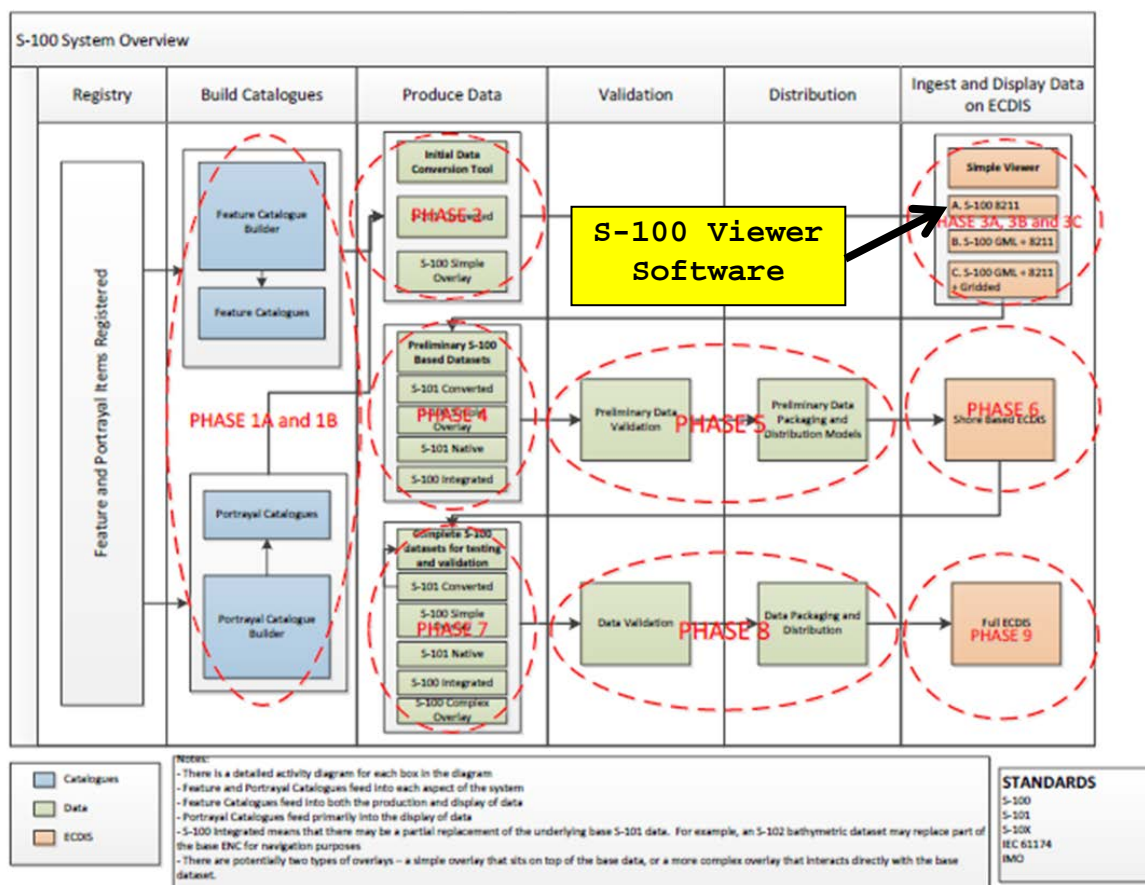


Figure 1 – S-100 System Overview with Phases 1-9

The United States S-100 Testbed will ultimately provide the software capability required in phases 3A, 3B, 3C, 6 and 9. All of these capabilities will be based on exploiting the experience gained from developing and fielding the Common Geospatial Extensible Navigation Toolkit (COGENT) software in the United States Navy. This research and development work is sponsored by the National Geospatial-Intelligence Agency (NGA), Maritime Safety Office.

S-100 Viewer Software Now Available

The S-100 Viewer software V1.0.0.0 has been released to the IHO and should be available at the IHO website:
<http://www.iho.int/srv1/index.php?lang=en>

In addition, there is a user's manual to help explain loading of data and operation of the S-100 Viewer software.

If you have any issues locating or downloading the software, please contact the S-100WG Chairperson Julia Powell at: julia.powell@noaa.gov.

If you have any questions or comments regarding the S-100 Viewer software V1.0.0.0, please email the software team at: S100Viewer@spawar.navy.mil

S-100 Viewer Software Status

There is a planned demonstration of the S-100 Viewer software for the S-100WG1 meeting to accompany this technical paper.

The goals of the S-100 Viewer software are:

- Verify the consistency in content and language between S-100 and the various geospatial product standards that spawn from S-100; initially focusing on S-101 ENC.
- To better understand the portrayal requirements of S-100 and S-101, as well as verify that those requirements are properly partitioned and implemented.
- Verify the current XML, XSD, and XSLT files that represent information taken from the feature registry and the portrayal registry.
- Verify that the specifications define a clear, unambiguous process for translating from a products dataset to a valid portrayal via automated generation of portrayal instructions.
- We are verifying that all aspects of S-100 and the associated portrayal are 100% machine readable.

In order to satisfy these goals, the S-100 Viewer software implements a feature catalog browser, a dataset browser, an error/validation log, and dataset portrayal. The S-100 Viewer software V1.0.0.0 is using the following versions of these S-101 components:

- Feature catalog 0.8.9
- Portrayal catalog 1.0
- S-57 to S-101 converter 0.8.19

The S-101 components are used to generate the portrayal as described within this paper. In order to generate the feature portrayal, the converted S-101 data is loaded and XML feature data is generated. The XML feature data is run through the portrayal rules as defined in the portrayal catalog, and XML draw instructions are generated. These instructions are used along with the SVG files and color profiles provided in the portrayal catalog to generate the portrayal. This process is shown in Figure 2, with items provided from the portrayal catalog shown in green and the manufacturer developed generated items shown in blue.

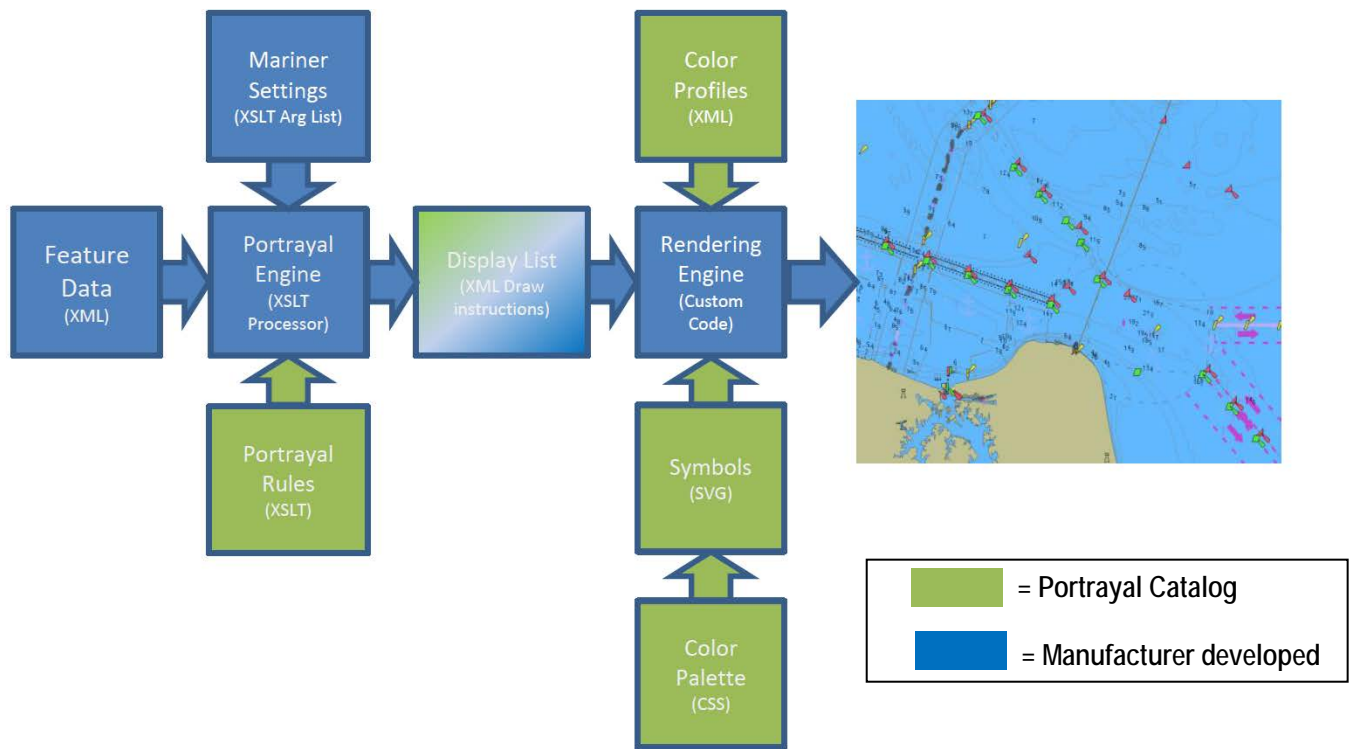


Figure 2 – S-100 Viewer Software Portrayal - Current Implementation

Updates to the S-100 Viewer Software

The reader may refer to TSM3-3.6B paper for details on the layout, organization and basic operation of the S-100 Viewer software. Since publication of TSM3-3.6B during Sep 2015, significant progress has been made in the design and development of the S-100 Viewer software.

Highlights of this progress include:

1. Additional Portrayal - new items portrayed include;
 - Text
 - Light sector arcs (see Figures 3 and 4)
 - Light sector leg lines
 - Area symbol fills
2. Chart Navigation
 - Chart can be zoomed and panned using the keyboard
3. Spatial Filter (see Figure 5)
 - The features list can be filtered by drawing/dragging a rectangle around the desired area to filter
4. Mariner Settings (see Figure 6)
 - The mariner settings defined by the portrayal catalog can be selected by the user
5. Search Filter Improvements
 - Custom filters are now selectable using the GUI
 - Additional custom filter types added
 - More items are searched in the feature catalog search
 - Items typed into the search box are now "ANDed" together to further refine search results
6. Screenshot
 - Screenshots can now be taken which are saved as .jpg files
7. Dataset Loading and Unloading
 - Datasets can be loaded and unloaded without the need to restart the software

Example Screen shots from the S-100 Viewer Software

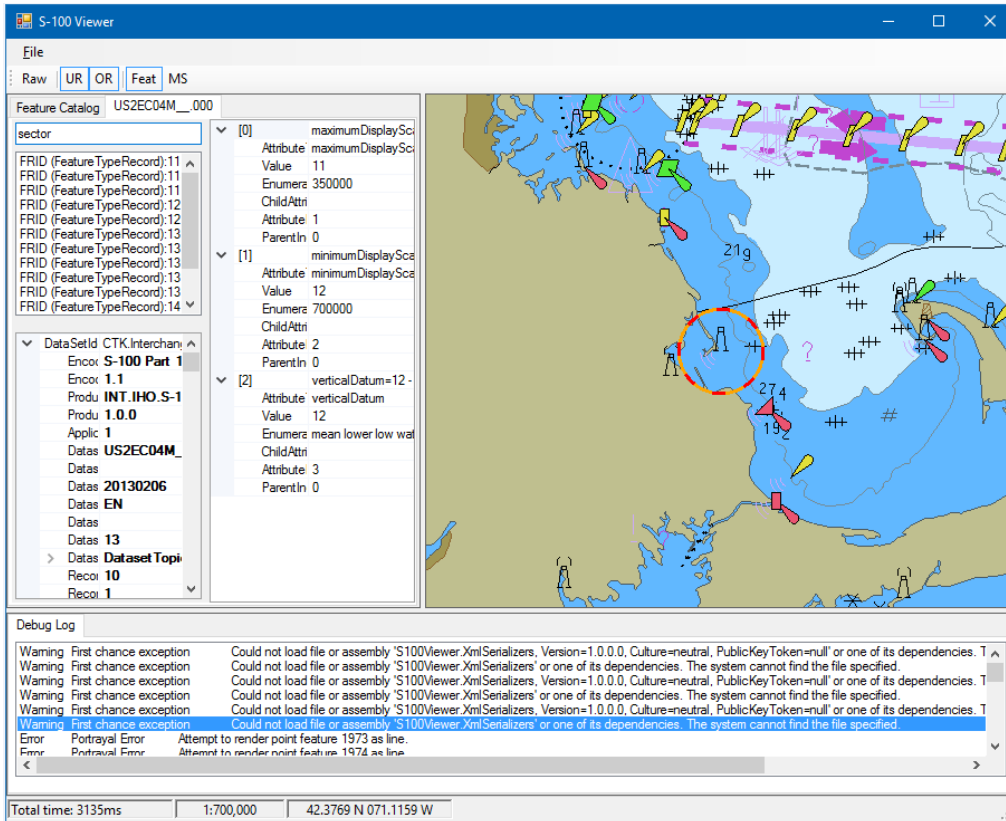


Figure 3 – Before; Missing light sector arcs

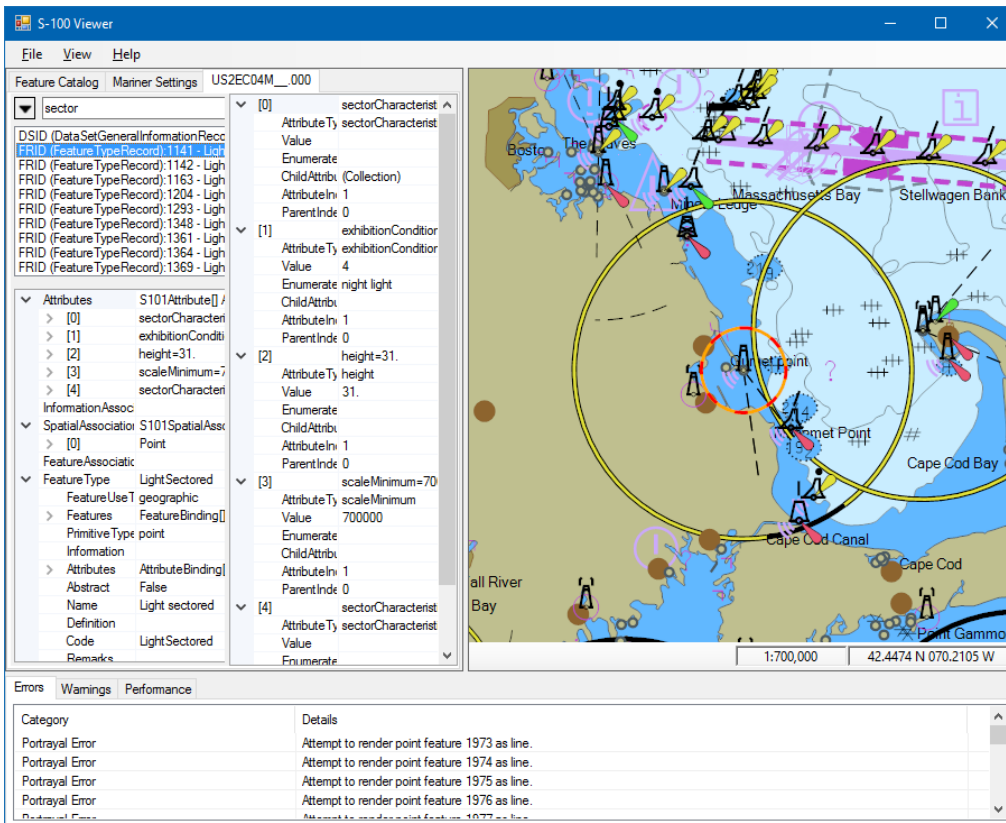


Figure 4 – After; Addition of light sector arcs (and other enhancements)

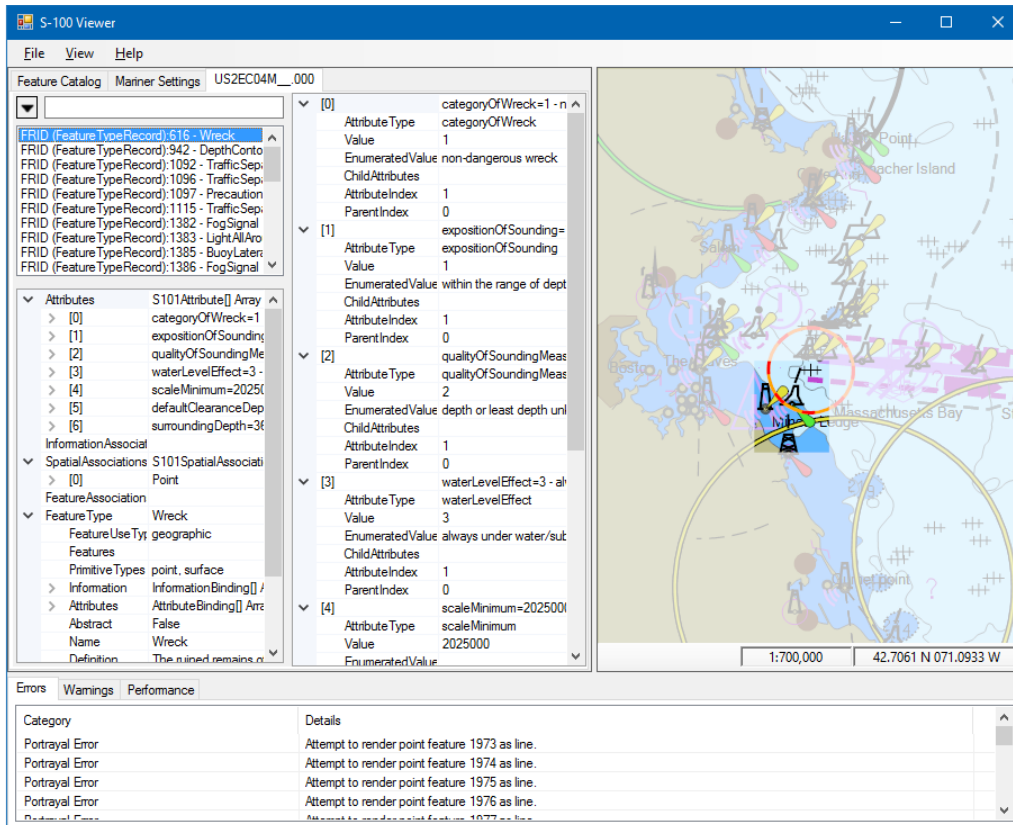


Figure 5 – Spatial Filter with selection of Wreck

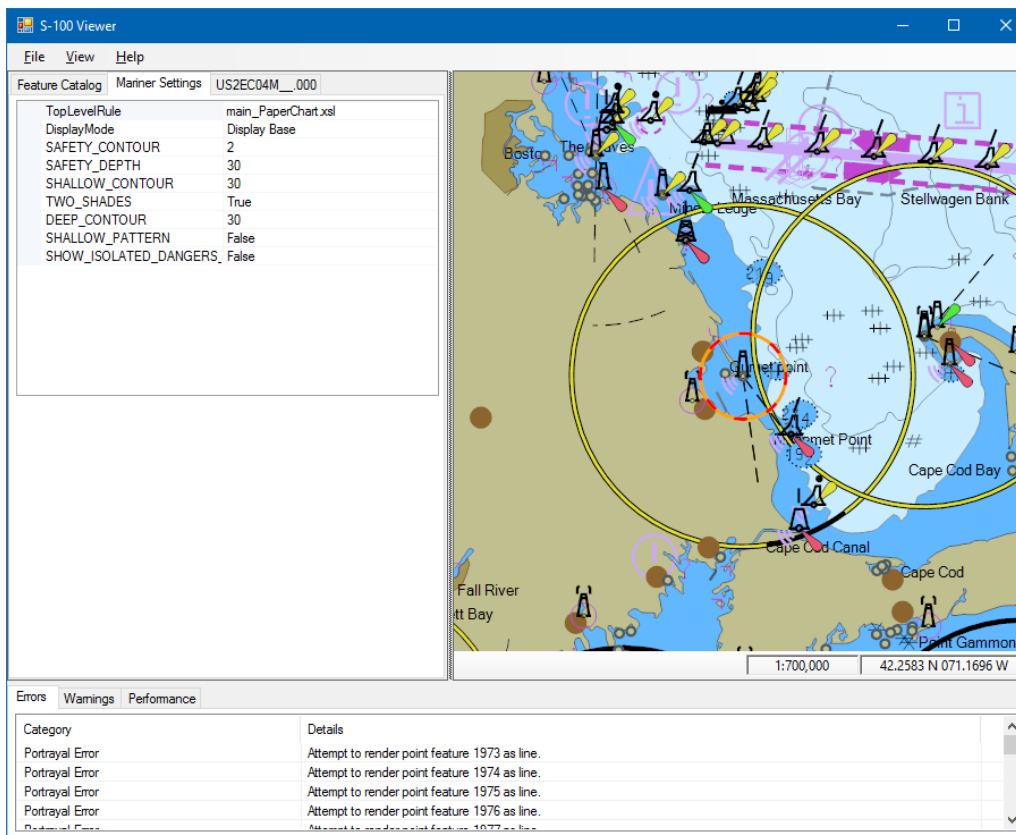


Figure 6 – Mariner Settings

Issues:

There are some outstanding technical issues with S-100 and S-101 that are too lengthy to document in this paper. These issues are covered in separate papers presented to both the S-100WG and the S-101PT.

Work to be done:

Here are some additional functions and Mariner settings not currently implemented in V1.0.0.0 of the S-100 Viewer software and accompanying rationale (this is not a comprehensive list):

- Display mode (base/standard/other) not implemented due to being incomplete in the portrayal catalog
- Dusk and night color profiles not provided in portrayal catalog, so only Day mode is implemented
- Full length light sectors not implemented since they are not included in the portrayal catalog parameters list
- Radar on/off
- Masked edges
- Full implementation of text portrayal

The S-100WG is invited to:

- A. **Endorse** the continued design and development of the United States S-100 Testbed software.
- B. **Download** and operate the S-100 Viewer software from the IHO and provide feedback on the design and operation.
- C. **Include** the US S-100 Testbed software as part of the S-100WG Work Plan.