IHO CSMWG-18
Cape Town, South Africa, 7-9 May 2008
[including a combined TSMAD-CSMWG meeting on 7 May]

S-101 Portrayal relations to S-100 Portrayal

Submitted by:	United States (NOAA)
Executive Summary:	S-100 and S-101 Portrayal
Related Documents:	ISO 19117
Related Projects:	N/A

Introduction / Background

S-100 – IHO Geospatial Standard for Hydrographic Data is a standard that includes all the components needed to build product specifications to handle a variety of different geospatial applications for hydrographic data.

Components of S-100 include the following:

Component Title	Part Number
Overview	S-100
Conceptual Schema Language	S-100
Feature Data Dictionary	S-100 Part 1
General Feature Model	S-100 Part 2
Hydrographic Metadata	S-100 Part 3
Feature Catalogue	S-100 Part 4
Coordinate Reference System	S-100 Part 5
Spatial Schema	S-100 Part 6
Imagery and Gridded Data	S-100 Part 7
Portrayal	S-100 Part 8
Encoding Components	S-100 Part 9
Building an S-100 Product Specification	S-100 Part 10
Maintenance Component	S-100 Part 11

In this scheme the existing S-57 Object and Attribute Catalogue becomes part of the Feature Data Dictionary and the existing S-52 Presentation Library migrates to a Portrayal Register that is based on S-100.

This paper will discuss the following topics:

1. The Progress of ISO 19117 – the base standard for S-100 Portrayal
2. What is S-100 portrayal?
3. What is S-101 portrayal?
4. Where does S-52 presentation library fit and what needs modification?
5. The way forward

Analysis/Discussion

Progress of ISO 19117 – the base standard for S-100 Portrayal

The base standard ISO 19117 was originally published in 2005, however, it is currently undergoing a major revision. As a result of this revision, the base standard is not in a stable enough condition to properly profile for S-100. However, many of the key concepts remain that enables the IHO to continue to proceed in the building of the portrayal register.

According to the ISO Portrayal team ISO 19117 shall be re-worked into a multipart standard. The parts are as follows:

- ISO 19117-1 The base standard will cover feature portrayal, including coverages which ISO TC 211 treats as a type of feature. The base standard primarily focuses on portrayal rules for the selection of symbols to portray instances of geospatial data, and portrayal specifications and symbol descriptions which are used to define symbols, etc. The revised standard will also include an "Enterprise View" of portrayal to put the portrayal mechanism in context with other aspects of portraying geospatial data. The new standard will also include Extensible Markup Language (XML) encoding of the UML models in the standard to assist implementers.

- ISO 19117-2 will cover a portrayal service that will use the portrayal rules and symbol specifications defined in Part 1 of the standard to render a map image. The very limited discussion of a portrayal service in the existing ISO 19117(2005) was removed and will be included in this section.
- ISO 19117-3 will cover cartographic finishing rules that are needed to make symbolized geospatial data into a finished map image. These might include rules for displacement, generalization, thinning, etc. The ISO 19117(2005) does not address this topic at all, but the issue was during coordination of the New Work Item Proposal (NWIP) for this project.[1]

A couple of key things that are also being considered for the revision of ISO 19117:

- Portrayal Catalogue in the existing catalog was changed to "Portrayal Rule Set". The existing standard used the term portrayal catalogue as a collection of portrayal rules, but catalogue is also used in other TC 211 standards differently. The Portrayal Catalogue term was retained but now is defined as a collection of portrayal rules AND their associated symbol definitions. This maintains consistency with ISO 19115 – Metadata, where Portrayal Catalogue is referenced as a means to portray a dataset, and also satisfies an International Hydrographic Organization (IHO) requirement for a mechanism to transmit the portrayal rules and the symbol descriptions together in one package.

- Portrayal Specification in the existing standard was retained but now is a reference in the "action" part of the portrayal rule that points to a symbol description.
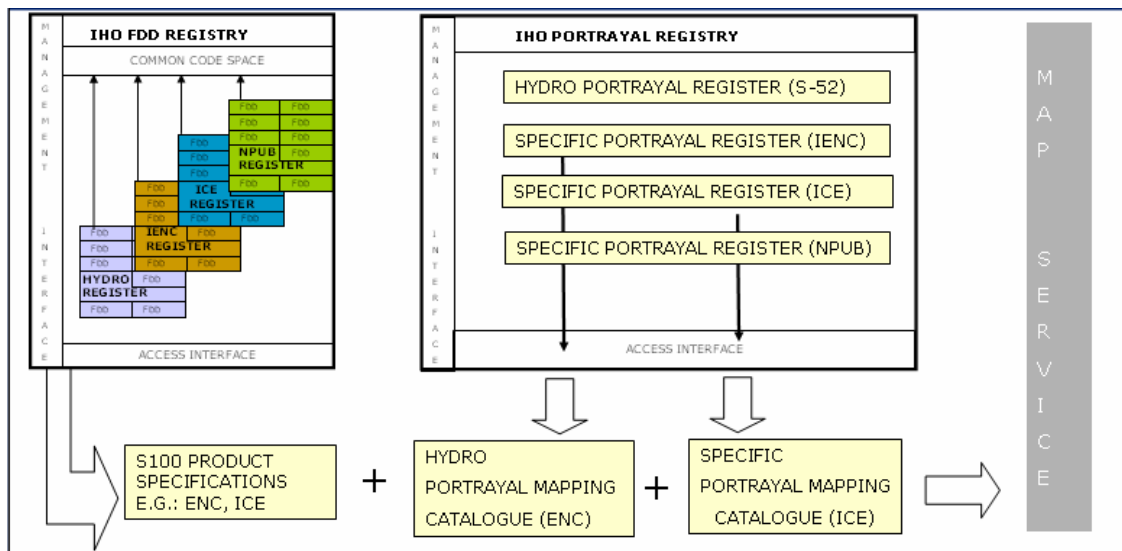
---

[1] Excepted from the ISO 19117 Revision Project Team Meeting Report – February 11-13, 2008 Chantilly, VA

- Symbol Description is a new concept that actually specifies the content of the specifications for a symbol or portrayal. Symbol descriptions can define area, line, point and text portrayals. This is an incomplete code list. Care must be taken when revising the standard not to limit to visual portrayal only. While not addressing the specifics, the existing ISO 19117(2005) leaves open the option for non-visual portrayal, including audio and tactile portrayal, and three-dimensional portrayal must also be considered.

- The "Feature Portrayal" was removed from the portrayal rule model. A portrayal rule set is now a collection of portrayal rules.

- The portrayal rule structure has been revised to allow for either associating a symbol description with a rule by referencing it in a portrayal specification and point to an external URL, or to allow for an in-line symbol definition to be included in the portrayal rule itself. This second method is a change to the existing ISO 19117(2005) but is already being used in OGC Symbology Encoding, and may be more efficient in some applications.[2]

What is S-100 Portrayal?

S-100 Portrayal utilizes the concepts laid out in ISO 19117. The main feature of S-100 portrayal is the creation of a portrayal registry that has a collection of portrayal registers. This is similar to the IHO registry for registers of feature data dictionaries.

The following graphic shows how the IHO Portrayal Registry is similar to the IHO FDD Registry.


The S-100 Portrayal register consists of the following:

  – Portrayal Catalogue

    • Collection of all defined portrayals

  – Portrayal Rules (part of the Portrayal Catalogue)

    • Collection of rules that are applied to the feature to determine what portrayal specification to use

  – Portrayal Specification

    • Collection of operations applied to the feature instance to portray it

What is S-101 Portrayal and where does S-52 presentation library fit?

In the S-100 domain the S-52 presentation library becomes part of the S-100 hydro register for portrayal.   The look-up tables become portrayal rules in S-100 and the symbols are registered in the S-100 portrayal register. Together these are placed in a portrayal catalogue that is used in a product specification. S-101 portrayal is such a specific portrayal catalogue for ENC that is mapped to the S-101 Feature Catalogue. The S-101 portrayal catalogue contains the symbols and the portrayal rules for S-101 ENCs principally in the same way as the S-52 PresLib does it for S-57 ENCs. The following figure is an example of the S-101 portrayal mechanism.
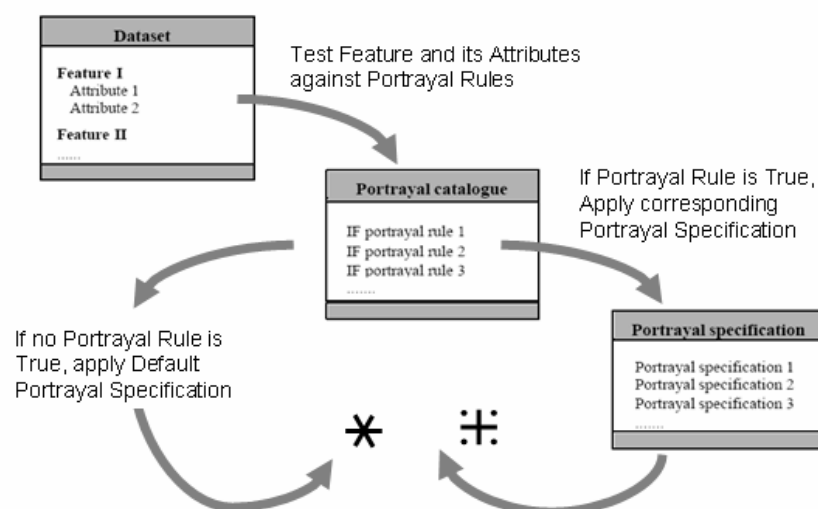
What can be taken from S-52, Appendix 2 directly and what needs modification?

In order to translate S-52, App. 2 into the S-100/S-101 environment, some parts of Appendix 2 and its Annex A, the PresLib can be adopted:

- the drawing engine can be adopted
- the concept of colour tables can be adopted
- the paper based description of symbols (Addendum) can be adopted

other parts of the PresLib must undergo a major review. For example:

- The concept of the look-up table needs review. Currently the look up table utilizes only a hard = and not a >= or <=. If these modifications were made, many of the CSP's could be eliminated.
- All the CSP's need to undergo review. There may be an opportunity to propose new features and attributes or create complex attributes that may eliminate the need for several of the CSP's.

Open questions are:

Should all symbols be made machine readable?

Should/can all CSPs be made machine readable?

The way forward

Work is progressing on the S-100 portrayal registry and register.   However, in order to finalize the work TSMAD and CSMWG need to wait until the ISO 19117 revision is in a more stable state (July 2008). Once the ISO standard is table then the S-100 profile can be finalized.

In order to progress S-101 portrayal, CSMWG should begin a thorough review of S-52, this includes the concept of look-up tables, symbology, and presentation.