Paper for Consideration by S-100WG

FRANCE COMMENTS ON S-98 SPECIFICATION

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Executive Summary:	S-98 Draft version 0.2 elaborates many powerful technical concepts to support the combined usage of data from various S-100 and other data products within an S-100 ECDIS. A review of the principles would be appreciated before the draft specification is passed to HSSC for approval.
Related Documents:	S-98 Specification for Data Product Interoperabity_v0.2 TSM5-5.3_Procedures_for_S-100_InteroperabilityCatalogue.pdf
Related Projects:	IHO S-100/S-10x Test bed e-navigation

Introduction / Background

1. One of the core issues to carry out e-navigation capability is to enable the mariners to use a harmonized presentation of information coming from different registered services and provided by different acknowledged producers.

The key topics to be solved are:

- how to identify the most relevant information available, depending on the context of navigation and of the status of the information, and
- how to display it on the ECDIS screen.

S-98 is the Product Specification (PS) for the implementation of an Interoperability Catalogue (IC) in S-100 navigation systems. The IC is dedicated to complete and supersede "standard" presentation libraries specific to each product, when more than one product are used together on the ECDIS.

Interoperability is thus a fundamental goal to reach in e-navigation context.

Analysis/Discussion

2. First, this paper acknowledges the outstanding work done to design such a product specification.

Yet, there are some issues in this draft document that need to be solved before going further in the validation process.

3. The main core that underpins the draft is the ability to design in advance an IC that comprises a set of rules (display planes, predefined combinations and feature suppression rules) that will be implemented by OEM developers in the S-100 ECDIS. These rules are supposed to fix existing conflicts where same information is encoded by different features (and/or different geometries) in different products (e.g. bathymetry in the S-101 ENC and in the S-102 bathymetric surface). However, these pre-established rules seem not to be context dependent and it is hazardous to decide in advance for the mariner and only let him choose the level of interoperability.

4. The PS introduction lacks a general overview of the conceptual principles on which it is based. This PS is technical but has a wide range of potential readers. A clear, complete and easy reading presentation of the concepts appears necessary to help these readers, starting with the HOs in charge of approving this standard. This presentation could be in the introduction, a part as a whole or why not a separate Guidance document (IHO "G" series).

5. In the S-98 draft 0.2, some fuzzy logic principles are present to take into account the contextual situation:
   - ✓ *" are mostly the same but there are minor differences"* (§8.1.2);
   - ✓ "*mostly the same*" (§8.1.2);

Such unclear terms should be explained (or, even better, replaced by more precise wording) in the PS.

6. Moreover, the PS as it is raises some other questions:
   - If such automatic rules are implemented in the ECDIS, how a Producing Authority and how a mariner can know precisely the way the information will be displayed? On a producer perspective, what will be the consequences on the way to produce the data (i.e. which data in which product)? This concerns also the design of S-100 PS (S-101 and others).
   - S-98 is considering solely S-101, and not S-57. Thinking of the delay to deploy S-101, right in place of S-57 ENCs, what would prevent from embedding the S-57 ENC in the set of e-nav products to consider? Is there a lack of XML implementation format?
   - What is a "superior" data? Who decides? Is the "superiority" hard-coded in the IC?
   - What about metadata? E.g. a S-102 product based on a 2015 survey in the approaches of a harbour, used with an ENC updated with a 2017 survey.
   - What are the mariner scenarios in the use of the S-100 ECDIS with ENC + additional data ? What about the mariner's proper decision related to the information to be displayed (analysis vs time consuming)?

7. It is appreciated that aspects such as "OEMs may add functions for enhanced automatic text placement" are taken into account in S-98 PS. This is a good movement towards the improvement the ENC display on ECDIS.

   "Skin of the Earth replacement" is also welcome, especially with future availability of S-102 products.

Conclusions

8. S-98 PS is a key document to build up an e-navigation capability. However the conceptual principles need to be better explained. The level of automation as suggested is to be well considered as opposed to more user selection process based on a cognitive approach by the mariner.

Recommendations

- In order to improve the S-98 PS, it is recommended to consider user cases to better define the needs and get the explicit level of choices under the responsibility of mariners.
- The responsibility of IHO PS developers, data producers and OEMs in the interoperability process should be established.
- Principles should be explained in a first part of the draft S-98.
- Principles should be reviewed and discussed.
- Beyond the S-98, draft guidelines for S-100 ECDIS are needed.
- Take into account the conclusions inside the document.

Justification and Impacts

As a key and cape e-navigation document, it is essential to clarify the principles beyond technical issues.

Action Required of S-100WG

The S100WG is invited to:

a. **Note** this paper;

b. **Discuss** the recommendations

c. **Propose** improvements of S-98 PS before presentation to HSSC.