TSMAD26/DIPWG5-10.8A

Paper for Consideration by the Transfer Standard Maintenance and Applications Development Working Group (TSMAD) and the Digital Information Portrayal Working Group (DIPWG)

Machine readability in the S-100 concept

Submitted by:	Furuno Finland Oy, later called as FFOY
Executive Summary:	Our company has actively participated in the creation of the S-100, S-101, etc. As a part of the process we have informed IHO workgroups that in addition to presentation (i.e. drawing of the symbols) the portrayal need also address IMO required alerts and indications based on the charted data. This issue has already been understood by many and there have been positive signals within last year to include the machine readable alerts and indications model as part of the portrayal. This new paper informs the reader that in addition to the above the fully working machine readability of a S-100 based layer requires also machine readability for the human machine interface (HMI) model.
Related Documents:	-
Related Projects:	Creation of the portrayal for S-100, S-101, etc.

Introduction / Background

1. Target of the IHO S-100 concept is understood to be machine readable so that generic ECDIS software could both update existing S-100 based layers and add new S-100 based layers without associated ECDIS software upgrade.

2. The target requires that the ECDIS can build everything needed for a layer based on machine readable instructions. Later in this document we call first time introduction of a new S-100 based layer as "registration" (i.e. a process in which the ECDIS read all machine readable model/instruction files for a layer). Later an already registered layer can be upgraded by registering new versions of the related machine readable model/instruction files.

3. In the recent CIRM meeting in Apr 2013 Gilles Bessaro/IHB presented current IHO state about S-100 and products based on S-100 concept. In his presentation he had following registers

- Feature concept dictionary (FCD) register, which contains all objects and attributes. The S-57 used to have these as printed document (result in the current S-57 based ECDIS was hardcoded in the software)
- Product specifications register, which contains all object+attribute combinations for a given S-100 based product. The S-57 Product specification used to have these as printed document (result in the current S-57 based ECDIS was hardcoded in the software)
- Metadata register
- Data producer code register, which contains all producer codes and which is for example a base to judge between ENC and non-ENC. The S-62 used to have these as printed document (result in the current S-57 based ECDIS was hardcoded in the software)
- Portrayal register, which for many people contain only presentation (i.e. symbols) of object+attribute combinations. The S-52 used to have these as a mix of machine readable (so called DAI.file) and printed document (result in the current S-52 based ECDIS was that most often the changes associated with a new edition of the presentation library required hard coding in the software).
    - For some people within last year the understanding of the portrayal register has been to include the alerts and indication model. In the current S-52 based ECDIS the alerts and indications has been based on hardcoded software.

4. In the recent CIRM meeting in Apr 2013 very few if any understood that the total machine readability of the S-100 based layers require more than identified in the paragraph 3 above.

Analysis/Discussion/Conclusions

5. Our opinion is that the total machine readability needs parameter/registry based instructions to replace all current hardcoded software elements associated with a layer. Our opinion is based on long experience with hardcoded layers such as AML and AIO.

6. Machine readability needs following machine readable registers, models, instruction (whatever one may want to call them)

- Object+attribute catalog (e.g. FCD), the embryo of this is already defined
- Product specification, the work for S-101 is under progress and will serve as an example for additional layers
- Metadata, the work for S-101 is under progress and may include already this
- Data producers list, we feel that this part is maybe not yet under progress
- Presentation library, the work named "portrayal" is under progress and the S-101 is used as practical test case to develop this part.
- Alerts and indications model, after repeated messages from FFOY on and after IHO TSMAD/DIPWG in 2011 Seoul many people have started to understand that we need this. We feel that this is now under progress within the "portrayal" and the S-101 is used as practical test case to develop this part.
- Human machine interface (HMI) model, this we have tried to get into the S-100 concepts by verbal discussions. This paper is the first written proposal from our side.

7. In the current S-52 the HMI part is called "viewing groups". It defines high level categories called "display base", "standard display" and "all other". Further it defines sub-layers of these high level categories (for example "Seabed, obstructions, pipelines", "Traffic routes" etc.). The details of these sub-layers have bound together the presentation instruction in the look-up-table and the functionality of the HMI. All this has been available as printed document in the S-52. The machine readable HMI model is actually to make the "viewing group model" available as a machine readable component of the "portrayal".

Recommendations

8. Based on this document IHO DIPWG and/or TSMAD should set a drafting group to draft the HMI model for the portrayal

Justification and Impacts

9. Full machine readability requires that the ECDIS is able to register all details of a layer without any need to have hardcoded layer specific software.

10. Without addressing this issue the ECDIS will require software upgrade and the ship owners will be disappointed when finding that the S-100 concept did not fulfil the promises made by the IHO.

Action Required of TSMAD

TSMAD is invited to:

a. endorse the need for the machine readable HMI model
b. agree the recommendations of this document

Action Required of DIPWG

DIPWG is invited to:

a. endorse the need for the machine readable HMI model
b. agree the recommendations of this document