

Paper for Consideration by S-101PT8
Update from the S-101PT “Scales” Sub-Group

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Executive Summary:	This paper informs the S-101PT on the works and actions accomplished by the Sub-Group dedicated to “Scales” in S-101.
Related Documents:	S-101 Product Specification (including DCEG) S-101 Annex A – <i>Data Classification and Encoding Guide</i> . https://github.com/iho-ohi/S-101-Documentation-and-FC/
Related Projects:	S-101 development.

Introduction / Background

- Following the S-101PT DCEG Sub-Group meeting 1 (21-22 January 2021) a Sub-Group was formed to initially review the ENC dataset load/unload processes.
- Another Sub-Group was later formed to discuss on “Scales in S-101”. This includes the scheming of S-101 ENC portfolio and the scale minimum policy.
- Due to the very close membership between the two Sub-Groups, it was decided to hold a common VTC meeting, allowing to have a complete view from ENC conception and data encoding to the final display on the ECDIS. The Sub-Group uses the following Github repository for discussions: <https://github.com/iho-ohi/S-101-Documentation-and-FC/>.
- During the meeting, the Sub-Group made a review of the S-101 documentation (Product Specification and DCEG), based on the presentation available on the Github. The discussions were rich and the meeting report is also available on the Github.
- This paper presents the major discussions and outcomes of the VTC meeting held a on 16 November 2021 (14.00 – 17.00 CET).
- Depending on the decision taken by the S-101PT, the Sub-Group will continue its work and will later submit formal proposals to the Project Team for approval.

A - “Scales” definitions

- The following definitions provided for the **maximum display scale (max DS)** and **minimum display scale (min DS)** in the DCEG (§ 1.3.1) and the PS (§ 1.3.2): “*the largest / smallest value of the ratio of the linear dimensions of features of a dataset presented in the display and the actual dimensions of the features represented (largest / smallest scale) of the scale range of the dataset*” have been questioned as they do not fit with the common definitions for these scales. The Sub-Group agreed that these definitions fit more to viewing scales and that it is important to keep this concept in the standard. In order to avoid inconsistencies, it was agreed to replace the two definitions by: “**Viewing scale**: *the value of the ratio of the linear dimensions of **features** of a **dataset** presented in the display and the actual dimensions of the **features** represented of the **dataset**.*”
- The Sub-Group also discussed on the **max DS** and **min DS** in terms of datasets display. The general opinion was that a dataset should only be displayed when $max. DS \geq MSVS < min. DS$ (MSVS being the Mariner Selected Viewing Scale on the ECDIS graphics window).
- There were also some discussions on when the overscale indication should be shown: at larger MSVS than the max DS, or do we allow a zoom in factor (as it is in S-57 in respect to CSCL)? This will be further tested and discussed.
- Finally, it was identified that there are (slight) different definitions of **max** and **min DS** in S-101 and S-100 documentation. It is suggested to align these definitions.

B – S-101 Datasets scale ranges

11. Discussions took place on how the Data Producers should set their S-101 dataset scale ranges. S-101 documentation (PS Figure 7; DCEG figures 2.2 and 2.3) shows cases of overlapping scale range, which is probably not the rule to be followed.
12. The situation where a dataset contains multiple Data Coverage features was also discussed. The Sub-Group agreed that objects should/must not be split at the limits of Data Coverage features and that, in such cases, the ECDIS should treat the dataset as a whole.
13. The S-101 documentation should provide guidance for Data Producers on how they should organize their S-101 ENC portfolio and set their S-101 dataset scales, so that they can control the final display on the ECDIS.
14. An action was decided to review the S-101 documentation to provide extended guidance for HOs on how to organize their S-101 ENCs schemes, taking into considerations the use / non-use of multiple data coverages datasets. Volunteers to be identified to participate.

C – Loading strategy

15. The concept of S-101 15 scale ranges versus S-57 6 Usage Bands was briefly explained. This is seen as a major improvement as all ECDIS systems will behave in the same way. It was also recalled that the concept of navigational purposes in S-101 is for cataloguing only and does not play any role in the ECDIS loading strategy. Nevertheless, it seems reasonable to advise Data Producers to have a consistent policy for allocating dataset scales as regard to the Navigational Purpose.
16. The sub-group also discussed the concepts of drawing the datasets “side by side” (i.e. respecting the feature objects display priority), or “one on top of the other” (when the datasets have different maximum Display Scales values), the latter situation implying obscuring of data (e.g. Light sectors). It was suggested to add a figure to illustrate these two cases in the documentation.
17. The lack of test datasets to test and improve the loading strategy description was underlined. It was agreed to provide NIWC with test data and that they would lead a review of the loading strategy as currently define in the documentation.

D – Mandating ECDIS viewing scales

18. Data Producers explained that the best possible application of S-57 SCAMIN policy is often ruined because there is no correspondence between the SCAMIN values encoded in the data and the viewing scales implemented in the ECDIS systems, and that, as it is, the situation will be reproduced in S-101. If the ECDIS had a minimum list of mandated viewing scales, based on scale minimum values, that would ensure that the mariner would visualize the data as it was planned by the Data Producer.
19. The idea is not to mandate all zoom increments on the ECDIS, which can remain at the OEM initiative, but to guarantee a minimum list.
20. The Sub-Group took an action to report this issue to the S-101PT, and ask to liaise to S-100WG and/or CIRM to try to come to an agreement on a minimum list of mandated viewing scales in ECDIS systems, so that the scale minimum policy as described in the DCEG is efficiently displayed.

Recommendations

21. It is recommended that the S-101PT approve the following actions:
 - “Scales” Sub-Group to review the S-101 documentation to provide extended guidance for HOs on how to organize their S-101 ENCs schemes, taking into considerations the use / non-use of multiple data coverages datasets. Volunteers are welcome to participate.
 - “Scales” Sub-Group to review (lead: NIWC) the loading strategy. Data Producers to provide test data for the loading strategy. Volunteers are welcome to participate.
 - S-101PT to liaise with the S-100WG to align the scales definitions throughout the S-100 and S-101 documentation.
 - S-101PT to liaise with S-100WG and/or CIRM to try to come to an agreement on a minimum list of mandated viewing scales in ECDIS systems, so that the scale minimum policy as described in the DCEG is efficiently displayed.

Action Requested of the S-101PT

22. The S-101PT is invited to:

- 1) **Note** this paper
- 2) **Approve** the recommendations
- 3) **Suggest** any recommendation or further action to the "Scales" Sub-Group.