

Paper for Consideration by S-101PT

Optimum Display Scale in S-101 Edition 1.2.0 - Comments

Submitted by:	DK, SE & FI
Executive Summary:	This paper outlines the DK, SE and FI perspective noting the paper submitted by Scales Sub-Group Lead to S-101PT12 Session 1 (as INF1 registered as S-101PT12-06.23)
Related Documents:	S-101PT12-06.23 , S-101 PS (including DCEG and FC)
Related Projects:	S-101 & S-164/S-98

Introduction / Background

The concept Optimum Display Scale was reintroduced in S-101, Ed. 1.2.0 for testing purposes ahead of a final decision to be made at S-101PT13 ([Agenda Item 6.5](#)). Testing of Optimum Display Scale has not been possible yet, due to the late availability of the 1.2.0 FC and subsequent tools. At numerous meetings (S-101PT11, Scales sub-group and S-98/S-164 sub group) there have been discussions regarding this concept, with strong opinions for both keeping optimum display scale and removing it. This paper should be read in response to points raised in S-101PT12-06.23 and [Github #101](#).

Analysis/Discussion

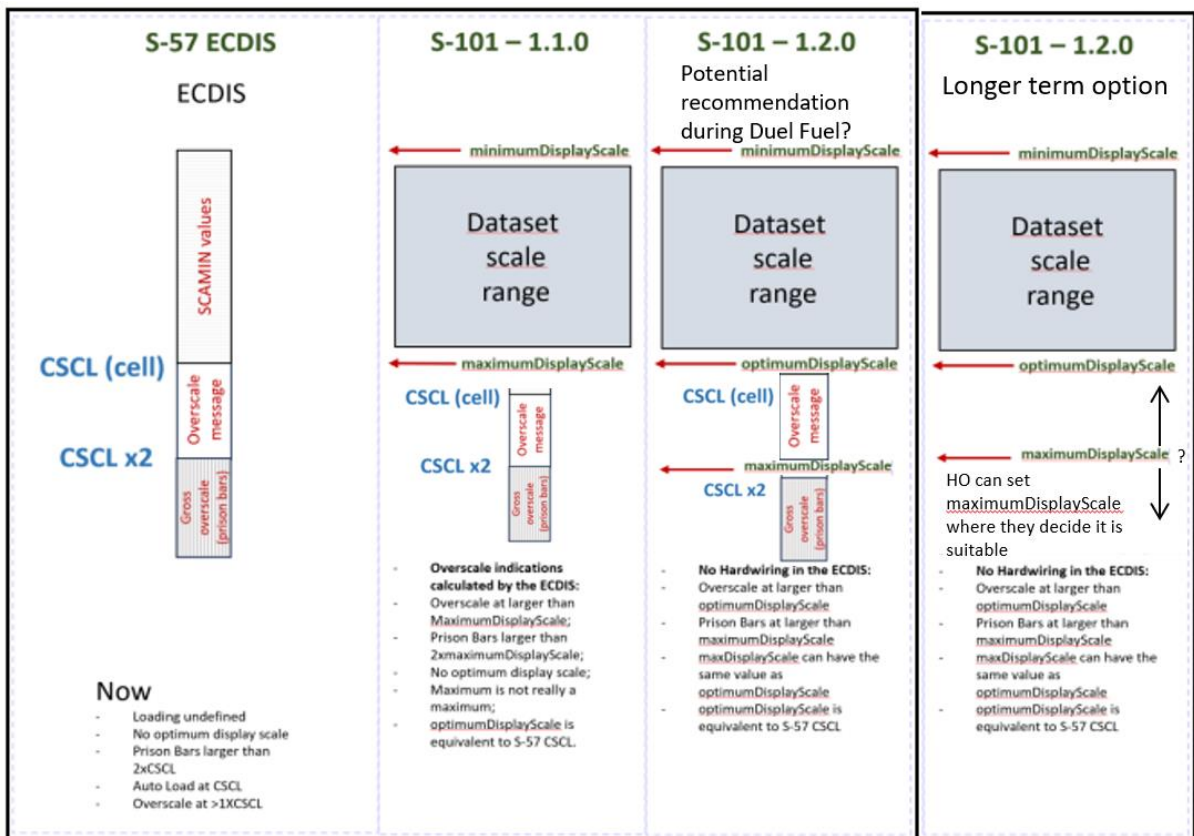


Diagram from S-101PT12-06.23 amended to clarify proposal (The compilation scale should be considered as the optimum display scale of the ENC dataset)

Comments in response to the arguments outlined in S-101PT/06-23A & [Github #101](#).

Arguments in favour of Optimum Display Scale:

- Flexibility for HO's to harmonise between neighbouring countries is an important element of providing the best user experience for the mariner. This is particularly important in areas, such as the Baltic, where there are up to 8 HO's with adjoining waters. A number of HO's can see a use case for Optimum Display Scale, which will allow HO's to harmonise an Optimum Display Scale and then allow each HO to set their Maximum Display Scales, dependent on their source capture and office policies. If Optimum Display Scale is not available and HO's wish to harmonise datasets regionally, it will be necessary to agree on a common regional maximum display scale which will be difficult to agree upon and demonstrated by the fact that most Regional Hydrographic Commissions have not been able to fully harmonise their datasets.
- One of the main reasons for introducing Maximum and Minimum Display Scale was to give the HO greater control over what is displayed to the mariner on the ECDIS. By setting the maximum and minimum scales the mariner will view the data at the scales that the HO decides are suitable based on source data capture, not a hardcoded limit in the ECDIS.
- Existing standards state that the compilation scale is equivalent to the optimum display scale of the S-57 ENC S-57 and S-65 both state that "The compilation scale should be considered as the optimum display scale of ENC data".
- Logically, if using a display range then you would expect the maximum display scale to be the last scale at which you could view the ENC (before prison bars). The proposal outlined in S-101PT12-06.23 is that the display maximum is x2 greater than the Maximum Display Scale. It will be difficult to explain to producers and mariners that the maximum limit is not the actual limit. The wish to keep alignment with S-57/S-52 display is the main argument to keep the x2 zoom, but this was originally a compromise on how to deal with the limitations of only having the compilation scale in S-57. Do we want to stick to this legacy item when we have the functionality to change it? The Dual Fuel period will hopefully be limited, but we will be left with the display scale limitations long after S-57 is retired. If we were starting fresh with the display strategy on the ECDIS with the encodings now available, we would not be implementing an arbitrary x2 zoom when we have a Maximum, Minimum & Optimum Display Scale.
- There appears to be existing confusion for mariners on how to correctly view ENC's while using the overscale function as shown by the fact the guidance has been produced on over-scaling in IHO S-66, [IHO Information on ENC Generalization, Over-Scaling and Safety Checking Functions in ECDIS, 2020](#) (to be incorporated in the new edition of S-67, in draft) and the Admiralty Guide to the Practical Use of ENC's, Edition 3, 2019. We have the opportunity to make the ENC display easier to explain to mariners.
- Optimum Display Scale is an allowable S-100_DataCoverage (S-100 Part 17-4.5, Edition 5.2.0) and is used in other S-1xx Product Specifications, for example, S-102 have maximumDisplayScale, minimumDisplayScale and optimumDisplayScale as optional attributes. Will having Optimum Display Scale in some product specifications but not others affect the display strategy on the ECDIS?

Issues raised against using Optimum Display Scale:

- That no complete proposal has been made to S-101PT for reinserting Optimal Display Scale into S-101 PS & DCEG.
Comment: This was not an action requested for S-101PT12, so it was not known this was a requirement. A proposal can be provided for S-101 PT13 if required. It should be noted, that Optimum Display Scale is an allowable attribute in S-100_DataCoverage and was previously in S-101 PS.

- That some HOs are not comfortable with the mariner to viewing the dataset at a larger scale than the current compilation scale.

Comment: Is there a difference between the HOs allowing the ECDIS to 2x zoom on the compilation scale/maximum scale and setting an overscale warning after the Optimum Display Scale? The same effect is visible to the mariner. The rules for overscale and grossly overscale (prison bars) are based on IHO S-52 Specifications for Chart Content and Display Aspects of ECDIS, which are approved by IHO Member States, HOs are allowing data to be viewed beyond the current compilation scale now, but with an overscale warning.

- Some HOs are happy with the current rules in S-52.
Comment: If an HO wants to retain the current behavior as in S-52 in their waters that is fully possible since the use of minimum/optimum/maximum display scale is flexible. The behavior is replicated by setting maximumDisplayScale to optimumDisplayScale x2.
- That it will complicate the production of ENC's for 'Dual Fuel' use.

Comment: HO's will need to coordinate the roll-out of their S-101 datasets, in particular taking into account 'Dual Fuel' display areas on an ECDIS. As stated in the HSSC report to Council 6, HO's are expected to produce a substantial coverage of S-101 by 2026, to enforce the implementation of S-100 ECDIS. As outlined in S-98 and the S-100 ECDIS Governance document, the ECDIS will load and display the S-101 ENC over the S-57. This means that the common use in an ECDIS is either S-101 only or S-57 only. The use of a mixture of S-101 and S-57 in the same geographical area will probably be rare.

Conclusions

This concept was added into S-101 1.2.0 in October 2023, for testing. It has not yet been tested but DK and SE are willing to provide test datasets if a software provider is able to assist in viewing and analysing the results.

It is not possible to submit new papers for discussion for S-101PT12 (Session 2), so it is proposed that a fuller proposal submission with is made to S-101 PT13, with results from testing.

If Optimum Display Scale is not included in S-101 PS Edition 2.0.0 it will be more difficult to reintroduce it at a later date or review the display mechanism. If we leave Optimum Display Scale in S-101, it gives the option to use its greater flexibility now or at a later date, but if an HO wants to align the S-101 display with the S-52 display, the HO can set the maximumDisplayScale to/close to the x2 zoom on the ECDIS display. If the HO does not wish to allow any over-scaling, it can set the optimum and maximum display scale to be the same. Perhaps software developers are able to assist in automating/converting these values.

Recommendations

Recommendation is to support Option A, to keep the guidance as it is and develop a test plan in advance of S-101 PT13.

Action Required of S-101PT

The S-101PT is invited to:

- a. note the paper
- b. agree to Optimum Display Scale being kept in S-101 1.2.0 for testing purposes as agreed at S-101PT11
- c. discuss if there are other options
- d. consider what the implications are to other S-1xx Product Specifications are if Optimum Display Scale is removed and how this affects other S-1xx products display algorithms