

Paper for Consideration by ENCWG5

Use of the 'closing' edge attribute by ECDIS

Submitted by:	Australia (AHO)
Executive Summary:	This paper highlights a particular symbolisation issue encountered in certain ECDIS brands and provides options to help reduce its occurrence.
Related Documents:	S-57 Appendix B.1 – Product Specifications for ENC; S-52 6.1.1
Related Projects:	S-101PT

Introduction / Background

The idea behind suppressing the symbolisation of objects at the ENC limit is to stop ECDIS from visually 'closing' an area object when, in reality, it continues into the cell next door.

Despite the right encoding, some ECDIS do not mask the symbology of area features at the border of ENC (data coverage) boundaries. This cause unnecessarily display cluttering and creates a confusing and not-seamless transition between ENC products.

This paper aims at highlighting this performance issue in certain ECDIS brands and making sure that appropriate type approval testing is included in a new version of S-64.

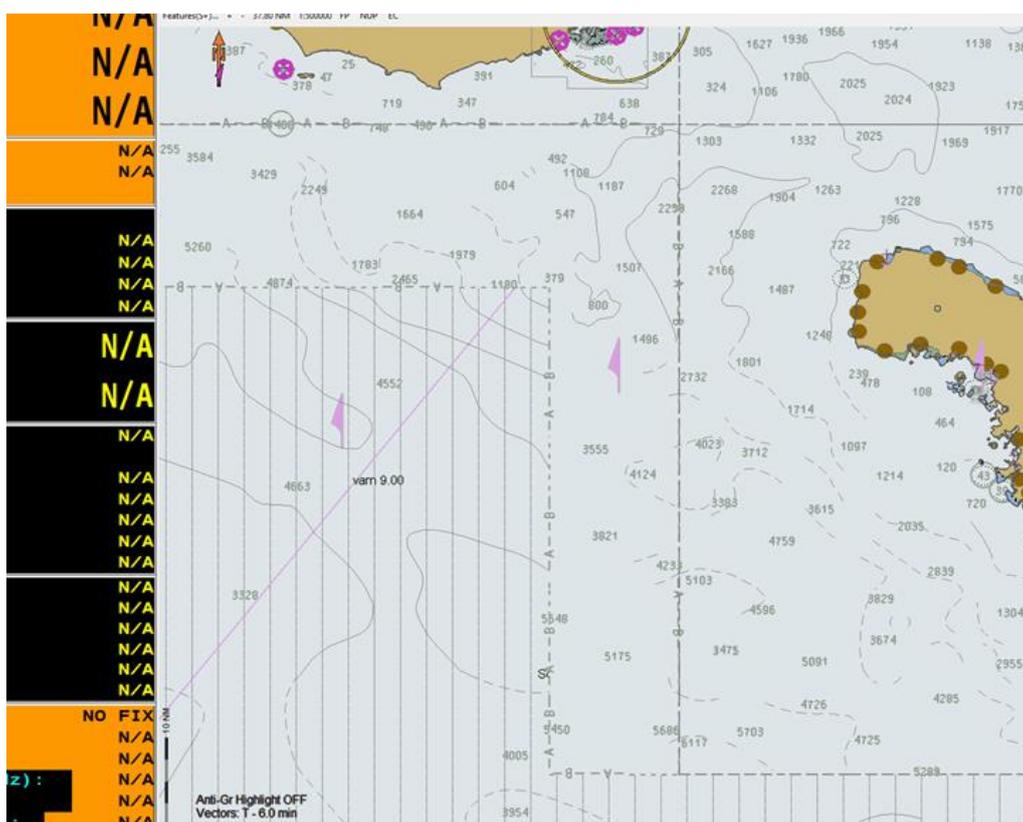


Figure: ECDIS unnecessarily displaying M_NSYS symbology in-between different ENC products

Analysis/Discussion

Below is a summary of the guidance provided in **S-57 Edition 3.1.1**.

- S-57 Main document, Part 3 clause **4.7.3.3 Interior and exterior boundaries** :

A USAG subfield with value "C" must only be used when the feature is truncated by the data limit. For example, at a cell border in an ENC (see Appendix B.1 – ENC Application Profile).

- S-57 Appendix B.1 – Product Specifications for ENC clause 3.8 – Geometry :

In certain circumstances, the symbolisation of an edge may need to be suppressed. This is done using the value {1} in the 'Masking Indicator' [MASK] subfield of the 'Feature Record to Spatial Record Pointer' [FSPT] field. If the value in the 'Usage Indicator' [USAG] subfield is set to {3} (exterior boundary truncated by the data limit), the MASK subfield must be set to {255} (null), in all other cases it must set to {2}.

6.3.2.14 Feature Record to Spatial Record Pointer field - FSPT

NB : All subfield values are encoded as binary.

Tag	subfield name	use	value	comment
NAME	Name	M		
ORNT	Orientation	M	{1} or {2} or {255}	= forward = reverse = null
USAG	Usage indicator	M	{1} or {2} or {3} or {255}	= exterior = interior = exterior boundary, truncated by the data limit = null

To identify that a boundary should be designated as an outer boundary truncated by the data limit (USAG = C), the geometry comprising the boundary of the data limit of the ENC cell (i.e. the area defined in **M_COVR** as CATCOV = 1 (coverage available)) must be attributed accordingly. Some production software may do this automatically but others require manual intervention by the user.

For production software that rely on user intervention to attribute edges coincident with the data limit with USAG = 3, **S-58 Ed 6.1.0** includes a validation check to detect noncompliance. Check 19 categorises this S-57 encoding shortfall as a WARNING only. The AHO is of the idea that this validation check should be upgraded to an ERROR because it 'may degrade the quality of the ENC through appearance' (refer to s-58 section 1.2 Check Classification).

19	(interior boundary) For each edge which is COINCIDENT with the data limit borders (i.e. limits of M_COVR with CATCOV is Equal to 1 (coverage available)) where USAG is Not equal to 3 (exterior boundary truncated by the data limit).	Edge coincides with the data limit and USAG does not equal 3 (exterior boundary truncated by the data limit).	Amend edge to USAG = 3 (exterior boundary truncated by the data limit).	Part 3 (4.7.3.3)	W
20	For each feature object	Geometric primitive	Use alternative	Part 3 (4.2.1)	C

Conclusion

The unnecessary symbolisation of S-57 area objects (i.e. M_NSYS) at the edge of ENCs has a negative impact on ECDIS display. This can be the result of ECDIS underperformance (i.e. not using the edge attribute USAG as it should) or due to incorrect S-57 encoding by the ENC producer.

At the moment, there are not dedicated ECDIS type approval checks allocated to detect this issue and the existing S-58 Validation check does not flag the problem with the severity it should, especially when WARNINGS are commonly overlooked by both, producers and RENCs.

Recommendations

Discuss the topic and evaluate the need of updating S-58 and/or S-64.

Justification and Impacts

The issue presented in this paper is another example of ECDIS underperformance mainly due to the lack of relevant UAT in S-64. This undermines ECDIS standardisation and, as a consequence, negatively impacts on the delivery of ECDIS' generic training.

Action Required of ENCWG

The ENCWG is invited to:

- discuss the relevance of the changes proposed by the AHO and
- incorporate these changes into the next version of S-58 and/or S-64