Paper for Consideration by ENCWG8

Multiple Coverage Areas within an ENC

Submitted by:	IC-ENC
Executive Summary:	This paper seeks to clarify the encoding of multiple M_COVR objects within an ENC and propose an additional check for S-58.
Related Documents:	S-57 Edition 3.1
Related Projects:	S-58

Introduction / Background

1. IC-ENC has received S-57 ENCs containing multiple coverage areas with all **M_COVR** meta objects attributed with the Category of coverage CATCOV = 1 (coverage available). All of these coverage areas share geometry and adjoin to provide a complete coverage of M_COVR meta objects for the ENC cells, with no M_COVR with CATCOV = 2 (no coverage available). The use of adjoining coverage areas with the same CATCOV value appears illogical and an inefficient method of encoding the ENC coverage.

Analysis/Discussion

2. Within S-57 Appendix B.1 ENC Product Specification, Section 2.2 states that the area within the cell which contains data must be indicated by a meta object M_COVR with CATCOV = 1. Any other area not containing data must be indicated by a meta object M_COVR with CATCOV = 2. S-57 Appendix B.1 Annex A, Use of the Object Catalogue for ENC, Section 2.1.8 contains guidance on the creation of seamless ENC coverage and Section 2.8.1 provides guidance on the capture of M_COVR objects.

3. The guidance within the specification does not provide any recommendations for the use of multiple M_COVR objects which are adjoining, aside from the use of different CATCOV areas. It is unclear therefore if it is permissible to capture multiple adjoining M_COVR objects with CATCOV = 1.

4. As there is no guidance on the use of adjoining M_COVR objects with CATCOV = 1 within S-57, S-58 does not include a check to identify areas of adjoining coverage with the same attribution.

5. During assessment of this issue, IC-ENC reviewed the S-57 ENC within ECDIS systems and has identified that ECDIS could handle this encoding differently. In all tested cases the S-57 ENC appeared to display correctly at the compilation scale, however, when using the pick query tool in some modules and display modes one ECDIS was unable to identify the cell and did not display any objects or attribution within the query window. In the modes where the ENC was identified, viewing the coverage area would only show the portion of the M_COVR queried and not be representative of the whole ENC.

6.In being unable to perform the query on ENCs captured with this scenario, there is the potential for Mariners to be unable to access safety critical information, such as the depth information of obstruction objects or the additional information contained within RESARE objects.

7. Consequently, IC-ENC would like to propose that guidance is issued for data producers and the UOC updated to provide guidance that adjoining M_COVR features that have the same CATCOV value must be avoided; any adjoining M_COVR objects with the same CATCOV value must be merged into a single feature.

8. IC-ENC would also propose that S-58 is updated to include a new check:

Check Description	Check Message	Check Solution	Category
For Each M_COVR feature object where the boundary geometry is coincident with the boundary of another M_COVR feature object and the CATCOV of each feature object is equal	M_COVR object unnecessarily split	M_COVR objects should be merged	

Recommendation

9. IC-ENC invites ENCWG to consider that guidance for S57 ENC production is amended so that any M_COVR meta objects that have coincident geometry and an equal CATCOV attribution be captured as a single M_COVR meta object.

Action Required of ENC WG

The ENC WG is invited to:
    a. Include an update to the UOC at its next update to include guidance to merge M_COVR objects where the geometry of the feature objects is coincident and the CATCOV attribution is equal.
    b. Include an update to S-58 to include a new check to identify adjoining M_COVR objects with the same CATCOV attribution.

Annex A: Example of S-57 ENC with multiple M_COVR, all CATCOV values – 1 coverage available

ENC With Multiple M_COVR

ENC contains 7 M_COVR objects, all M_COVR objects have CATCOV = 1, coverage available

CATCOV = 1

CATCOV = 1

CATCOV = 1

CATCOV = 1

CATCOV = 1

CATCOV = 1

CATCOV = 1

70°42.00'W

70°36.00'W

26°18.00'S

70°42.00'W

70°36.00'W