

Paper for Consideration by S-101PT

New category of restricted area to indicate dangers to sub surface vessels

Submitted by:	United Kingdom
Executive Summary:	Proposal to add “submarineDangerArea” as a new enumeration for the attribute, “categoryOfRestrictedArea” in S-101 Edition 1.2.0
Related Documents:	S-101 FC, S-101 DCEG
Related Projects:	S-101

Introduction / Background

S-101 contains an extraction of real-world information necessary for the safe navigation of vessels.

S-4 at B-620.3 b. states the requirement for charting to be maintained for sub-surface operations,

b. Changes in general charted depths significant to submarines, fishing vessels (for example snagging trawl nets) and other sub-surface operations (depths to about 800 metres) including reports of new dangers and changes to least depths over underwater structures, for example: wellheads; pipeline manifolds. The following is a general guide for changes in depths greater than 31 metres:

Some current examples in which the S-101 DCEG v1.1.0 refers specifically to the needs of sub-surface users of ENC are as follows,

12.1.1 Description of the seabed (see S-4 – B-425 to B-427)

The nature (quality) of the seabed (bottom) must be shown in sufficient detail, where known and on the appropriate maximum display scale ENC data, for such purposes as:

- to give an indication of the nature of the seabed in deeper waters for fishermen and submariners.

13.4.1 Rocks which may cover (see S-4 – B-421.2 to B-421.4)

Full details of all dangers to navigation must be encoded except in those areas for which the ENC is clearly inappropriate for navigation (see S-4 – B-401 and B-402). The fullest possible information on clearance depths must be given irrespective of their depths, where known, in preference to making any arbitrary distinction between “dangerous” and “non-dangerous” depths. This will allow navigators of all classes of vessels, including deep-draught ships and submarines, to make their own assessments of what is dangerous to them.

13.5.1 Wrecks (see S-4 – B-422, B-422.1 to B-422.8)

Wrecks must be encoded to whatever depth they are considered to be of interest, also taking account of the needs of submarines and fishing vessels where appropriate, but not generally in water deeper than 2000m. (Trawling regularly takes place in depths of 400m and occasionally in depths as great as 2000m).

16.6.1 Dumping grounds (see S-4 – B-442; B-446 and B-446.1)

Dumping of harmful materials is unlikely to affect depths substantially and such dumping grounds are encoded primarily as a warning against anchoring, trawling or other submarine operations.

In the context of growing AUV/UV activity it is envisaged that the requirements to capture areas deemed a danger to sub surface operators shall increase and therefore consistency in capture amongst nations is required.

Analysis/Discussion

In the current data model, there is no way to encode a *categoryOfRestrictedArea* identified as being a danger to the navigation of sub surface operators. This places an over reliance on the attribute *Information* to specify the actual *categoryOfRestrictedArea* specific to sub surface operations.

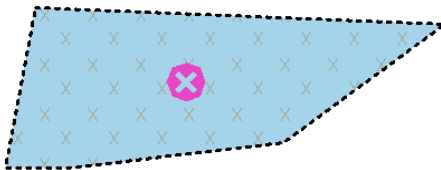
Since this *categoryOfRestrictedArea* directly affects the navigation of sub surface vessels there is a need to clearly specify the category. As concluded in the report of the MASS PT, the use of the *information* attribute, a free text attribute, needs to be reduced to make the information more machine-readable.

In meeting the user requirement, the following were considered as part of the analysis,

1. The use of Obstruction, category of obstruction = 6 (foul area)

IHO Definition: An area of numerous unidentified dangers to navigation. The area serves as a warning to the mariner that all dangers are not identified individually and that navigation through the area may be hazardous. (IHO Dictionary – S-32).

This was deemed insufficient given not all submarine danger areas are related to physical obstructions and the portrayal (in ECDIS “base display” as an obstruction to navigation) would indicate the whole of the area in question is an obstruction, effectively ‘blued out’. Dependent on the restriction attributed to the area this is not what is intended. Furthermore, some submarine danger areas cover a large geographical extent, to capture as a foul area could confuse surface users, forcing them to amend route plans, potentially pushing them closer to dangers.



2. The use of Foul Ground

IHO Definition: Areas over which it is safe to navigate but which should be avoided for anchoring, taking the ground or ground fishing. (IHO Dictionary – S-32)

This Feature is deemed insufficient as dependent on the category of restriction placed on the specific submarine danger area (e.g. divingRestricted) an area over which it is safe to navigate would not be applicable.

3. A proposal to include a new enumeration value to the attribute *categoryOfMilitaryPracticeArea* for Military Practice Area

IHO Definition: An area within which naval, military, or aerial exercises are carried out. Also called an exercise area. (Adapted from IHO Dictionary – S-32).

This is deemed inadequate owing to these areas being specified for exercises rather than indicating the existence of hazards to dived submarines. Furthermore, Military Practice Areas as the name suggests are defence focused and this would not cater for the needs of non-military users. Additionally, a Military Practice Area could be interpreted as a navigationally safe area for military exercises, where in reality it is dangerous for submarines and AUV's.

Conclusions & Recommendations

A new enumeration value of the attribute *categoryOfRestrictedArea* for Restricted Area is needed. The enumeration shall have the name “submarineDangerArea” with the definition ‘An area in which submarine operations are prohibited or limited, owing to the existence of hazards to dived submarines (AHP6 Vol.II)’

The suggested new category will aid consistency in the capture of Submarine Danger Areas while allowing for the wide variety of hazards and restrictions of individual Submarine Danger Areas to be captured in the attribution already bound to Restricted Areas.

In order to reflect the requirement for this category to alert in ECDIS (akin to how in S-57 the attribute RESTRN encoded on RESAREs triggers an alert – as stated in MSC.530(106) – Appendix 4)) it is proposed to include this new “submarineDangerArea” enumeration to the list of categoryOfRestrictedAreas which shall trigger an alarm in ECDIS. [S-52 Ref 10.5.10/S-98 Ref C-14.9.8](#) for CATREA = 28 provides an example of expected functionality.

To cover all users in this environment and to differentiate from the restriction values 11. “divingProhibited” and 12. “divingRestricted” which refer to recreational diving, two new enumeration values of the attribute restriction for RestrictedArea are required. The enumerations shall be named ‘divedNavigationProhibited’ and ‘divedNavigationRestricted’ with the respective definitions ‘*A specified area within which dived navigation is prohibited in accordance with certain specified conditions*’ and ‘*A specified area designated by appropriate authority, within which dived navigation is restricted in accordance with certain specified conditions*’.

Justification and Impacts

1. S-101 PT to consider adding the “submarineDangerArea” enumeration for the attribute, categoryOfRestrictedArea to adequately reflect dangers to sub surface users.
2. S-101PT to consider adding the “submarineDangerArea” enumeration to the list of categoryOfRestrictedArea which shall trigger an alarm in ECDIS
3. S-101 PT to consider including the restrictions, ‘divedNavigationProhibited’ and ‘divedNavigationRestricted’
4. Update the 17.8 Restricted Area entry of the S-101 DCEG (DCEG Sub-Group)

Action Required of S-101PT

The S-101PT is invited to:
Discuss and agree on this proposal