

**Paper for Consideration by S-101PT (DCEG Subgroup)  
Improved data model for feature Cable Submarine**

<b>Submitted by:</b>	Germany
<b>Executive Summary:</b>	Correction for feature class Cable Submarine
<b>Related Documents:</b>	Data Classification and Encoding Guide Edition 1.1.0, Annex A, S-57 Ed.3.1
<b>Related Projects:</b>	S-101

### Introduction / Background

We have tested a test version of S-101 Converter from CARIS and hereby some issues about the standard came up, that should be improved.

- For any communication cable category of cable 8 (fibre optic cable) is used. S-57 has the categories telephone and telegraph. Indeed, at the present time, telephone cables will be data cables. But in many cases the technology of the cable is not known and not important. Technology may change, too. Sometimes the current technology will be based on fibre optic, some years later newer technologies are developed based on other materials, for example. So the suggestion is to change category of cable 8 into communication cable.
- This paper proposes a correction for feature class Cable Submarine

### Analysis / Discussion

In S-57 for Attribute Acronym CATCBL following IDs are allowed:

- Power Line
- Transmission Line
- Telephone
- Telegraph
- Mooring Cable.

This will be transferred in S-101 to category of cable

- Power Line
- Mooring Cable
- Ferry
- Fibre Optic Cable and this should be changed into Telecommunication Cable, because former telephone or telegraph cables will be data cables today, but we should depict them independently from any transmission technology.

### Conclusions

It is proposed to review the data model and amend the DCEG as follows:

#### 14.2 Submarine cables

<u>IHO Definition:</u> <b>SUBMARINE CABLE</b> . An assembly of wires or fibres, or a wire rope or chain, which has been laid underwater or buried beneath the sea floor. (IHO Dictionary – S-32).		
<u>S-101 Geo Feature:</u> <b>Cable Submarine (CBLSUB)</b>		
<u>Primitives:</u> Curve		
<i>Real World</i>	<i>Paper Chart Symbol</i>	<i>ECDIS Symbol</i>

S-101 Attribute	S-57 Acronym	Allowable Value	Encoding	Type	Multiplicity
buried depth	(BURDEP)			RE	0,1
category of cable	(CATCBL)	1 : power line 6 : mooring cable 7 : ferry 8 : <del>fibre optic cable</del> telecommunication cable		EN	0,1
condition	(CONDTN)	1 : under construction 5 : planned construction		EN	0,1
feature name				C	0,*
display name				(S) BO	0,1
language		ISO 639-2/T		(S) TE	0,1
name	(OBJNAM) (NOBJNM)			(S) TE	1,1
fixed date range		See clause 2.4.8		C	0,1
date end	(DATEND)			(S) TD	0,1 †
date start	(DATSTA)			(S) TD	0,1 †
status	(STATUS)	1 : permanent 4 : not in use 13 : historic 18 : existence doubtful		EN	0,*
scale minimum	(SCAMIN)	See clause 2.5.9		IN	0,1
information		See clause 2.4.6		C	0,*
file locator				(S) TE	0,1
file reference	(TXTDSC) (NXTDSC)			(S) TE	0,1 †
headline				(S) TE	0,1
language		ISO 639-2/T		(S) TE	0,1
text	(INFORM) (NINFOM)			(S) TE	0,1 †

† For each instance of **fixed date range**, at least one of the sub-attributes **date end** or **date start** must be populated.

For each instance of **information**, at least one of the sub-attributes **file reference** or **text** must be populated.

INT 1 Reference: L 30.1, 31.1, 32; Q 42

Submarine cables (see S-4 – B-443; B-443.1-2 and B-443.7-8)

Submarine cables are used to carry power or telecommunications. All power cables and most telecommunication cables carry dangerous voltages. Submarine cables are potential hazards to both vessels and life, particularly to fishing vessels engaged in trawling the seabed. Where possible, submarine cables are now buried beneath the sea floor in water depths of less than 1000 metres; however there remains a large percentage unburied. Submarine cables are vulnerable to damage from anchoring, trawling or other seabed operations; even small craft anchors can penetrate a soft seabed sufficiently to foul a cable. Damage to telecommunication cables can lead to extensive disruption of national and international communications, whilst damage to power cables can disrupt electricity supply.

Submarine cables, including disused cables, should be encoded to indicate their presence to vessels engaged in anchoring, trawling or seabed activities in order to:

- Warn mariners of the potential hazard to their vessel, including electric shock to any vessel fouling or breaking the cable, possible capsizing of a small vessel if its fishing gear or anchor is trapped under the cable, or loss of gear (trawls or anchor cables).

- Prevent damage to the cable and avoid disrupting the service the cable may be providing.

Active cables should be encoded to a depth of 2000 metres (which is the deepest depth of water to which vessels may be endangered by fouling the cable).

If it is required to encode a submarine cable, it must be done using the feature **Cable Submarine**.

Remarks:

- If the buried depth varies along the cable, the cable must be encoded as several features.
- Telecommunications cables such as telephone and optic fibre cable must be populated, where required, by populating attribute **category of cable** = 8 (~~fibre-optic-cable~~; telecommunication cable)
- Where a cable is disused, it should be encoded with the attribute **status** = 4 (not in use), and the attribute **category of cable** should not be encoded. Few disused cables are recovered and so to encode them all would lead to clutter in the data. Also, accurate records of their positions are likely to be incomplete (some cables having been cut or dragged out of position), so there is a case for encoding them very selectively. Where disused cables traverse possible anchorages or where there is known seabed activity, for example trawling grounds, they should be encoded on the largest maximum display scale ENC data covering the area, provided they do not obscure more important information.
- In certain circumstances, high voltage power cables may cause a deviation in a ship's magnetic compass; in these cases, where reports have been received, they should be treated as local magnetic anomalies (see clause 4.2).
- If it is required to provide the contact details of cable owners/operators (in cases of damage to a cable or for reparation for loss of an anchor in order to avoid such damage), this must be done using an associated instance of the information type **Contact Details** (see clause 24.1).
- Cables, buried so deep that they are not vulnerable to damage from anchoring, should not be encoded (so that mariners are not unnecessarily inhibited from anchoring or fishing). In marginal cases they may be encoded as **Cable Submarine** with the nominal depth to which they are buried encoded using the attribute **buried depth**.

Distinction: Cable Overhead; Cable Area.

Feature/Feature associations:      **Mooring Trot Aggregation; Updated Information; Text Association**

Feature/Information associations:      **Additional Information**

Spatial/Information association:      **Spatial Association**

**Recommendations**

It is recommended to:

- Review the S-101 Ed. 1.2.0 DCEG as shown above;
- Align the S-101 Feature Catalogue accordingly.

**Action Required of S-101PT**

The S-101PT (DCEG Subgroup) is invited to:

- Discuss this paper
- Agree with the recommendations