

8th ENCWG Meeting
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Paper for Consideration by ENCWG
S-101 Attribute Nature of Construction “Latticed”
in Geo Feature Beacon Special Purposes General

Submitted by:	Pushidrosal
Executive Summary:	Proposed consideration to obtain an automatic encoded value Latticed for the Nature of Construction Attribute on the Beacon Special Purposes General Geo Feature when converting S-57 to S-101.
Related Documents:	S-57 Appendix B.1 Annex A (UOC Edition 4.3.0), S-65 Annex B Edition 1.1.0.
Related Projects:	S-57 to S-101 Conversion

Introduction / Background

The BCNSPP (P) object class in S-57 will be converted into a Beacon Special Purpose General (P) in S-101 Geo Feature. One of the changes to the Beacon Special Purpose General in S-101 Geo feature from BCNSPP object class in S-57 is the removal of encoding value “Lattice beacon” in the Beacon shape Attribute and it becomes an Attribute value of Nature of construction.

The S-101 attribute **nature of construction** includes the new enumerate value *11* (latticed). This information is encoded in S-57 on **BCNSPP** using the mandatory attribute BCNSHP value *4* (lattice beacon), which is not an allowable value for the mandatory attribute **beacon shape** in S-101. Data Producers will be required to evaluate their converted S-101 data and populate **beacon shape** with an appropriate allowable value.

S-65 Annex B S-57 ENC to S-101 Conversion Guidance Edition 1.1.0

Acronym: BCNSHP		Code: 2	
Attribute type: E			
<u>Expected input:</u>			
ID	Meaning	INT 1	M-4
1	: stake, pole, perch, post	IQ 90;	456.1;
2	: withy	IQ 92;	456.1;
3	: beacon tower	IQ 110;	456.4;
4	: lattice beacon	IQ 111;	456.4;
5	: pile beacon		
6	: cairn	IQ 100;	456.2;
7	: buoyant beacon	IP 5	459.1-2;

S-57 Appendix A, Chapter 2: Attribute Catalogue, BCNSHP

Analysis / Discussion

To find out the results of the conversion of the Beacon shape and Nature of construction attributes on the S-101, several converter software's are used. Trial conversion using all existing software is not intended to compare the advantages of each software, but only as a tool to find out the possible conversion results.

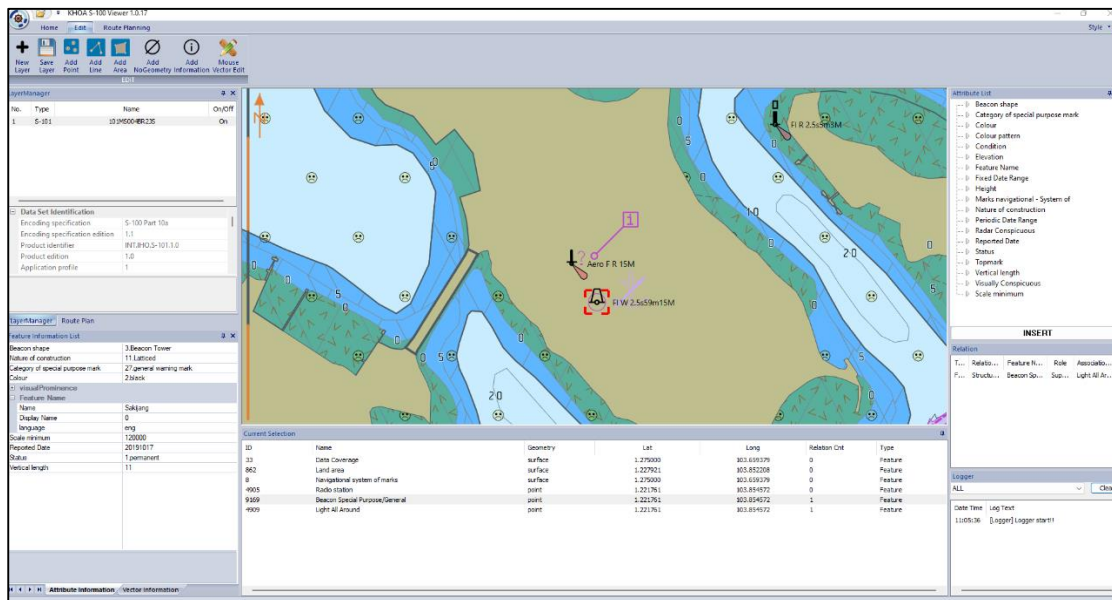
ENC, tools and conversion methods used:

- ENC Band 4: MS4BR2JS ed. 10 up. 13, Compilation Scale: 45.000;
- Converter: ArcGIS Pro 3.0.3 within S-101 FC 1.0.2; Caris S-57 Composer 4.1 within S-101 FC 1.0; dan dKart S-101 Converter 1.0 within S-101 FC 1.0.2.;
- Validation: 7Cs Analyzer Version 4.2.0 Build 3, Reference: S-101 ENC Validation Checks, Ed. 1.0.0;
- Display: KHOA S-100 Viewer version 1.0.17

In this conversion, FC version 1.0.2 is still used, where it is known that version 1.1.0 has now been released, but this version is still considered relevant because there are no changes to the Beacon Special Purpose section from version 1.0.2 to 1.1.0.

Conversion and Validation Result

From the conversion results using several software's mentioned above, it can be seen that two of the three softwares showed a critical error due to the mandatory attribute Beacon shape attribute was not filled in. This happens because BCNSHP = "4. Lattice" is no longer an attribute option for the Beacon shape on S-101, instead of Nature of construction Attribute which is an empty value.



Object: 100/9250 (2010,1570694312,69) **BeaconSpecialPurposeGeneral**

Categories: Attribute

Message: Mandatory attribute **beaconShape** is missing from **BeaconSpecialPurposeGeneral**.

Suggested Solution: Add missing mandatory attribute. Leave value empty if unknown.

References:

S-101 ENC Validation Checks, Ed. 1.0.0, check 507

The other software does not show any critical errors because it is automatically fills the Beacon shape attribute with the encoded value of Pile beacon, even though in fact Pile beacon is not an appropriate value to replace Lattice beacon, but rather Beacon tower. However, according to the IHO definition, a Beacon tower is a structure with a height (VERLEN) of 10 meters or more. Therefore, changing the default value of Pile Beacon to Beacon Tower on S-101 must be done manually.

Note: BCNSHP = 4 (lattice) depreciated in S-101. Encoding moved to Nature Of Construction. Beacon Shape set to '5 (pile)' by default, consider if '3 (tower)' may be appropriate for this feature.

Number of Objects: 3
[\(Select All\)](#)

[Untranslatable FOID](#) (BeaconSpecialPurposeGeneral)
[Untranslatable FOID](#) (BeaconSpecialPurposeGeneral)
[Untranslatable FOID](#) (BeaconSpecialPurposeGeneral)

3) **beacon tower**

IHO Definition: A solid structure of the order of 10 metres in height used as a navigational aid. (S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.5, November 2000).

If there is no other choice but to change the value attribute manually, then this will be quite a lot of cartographic work considering that in Indonesia there are huge numbers of BCNSPP within BCNSHP = “Lattice Beacon” which have varying heights above 10 m or less than 10 meters. Therefore, the choice of Beacon tower is also cannot meet the criteria based on the IHO definition. Consequently, automatic filling during conversion not only makes it easier to load ready conversion workload but also avoids missing-information.

S-101 Geo Feature: Beacon Special Purpose/General (BCNSPP)				
Primitives: Point				
<i>Real World</i>	<i>Paper Chart Symbol</i>	<i>ECDIS Symbol</i>		
S-101 Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
nature of construction	(NATCON)	1 : masonry 2 : concreted 6 : wooden 7 : metal 8 : glass reinforced plastic 11 : latticed	EN	0,*

The next issue is, if on S-57 there is a BCNSPP with “Lattice Beacon” and it has a NATCON value, for example “Metal”, then after the conversion to S-101, latticed information does not move automatically to NATCON value instead of missing and resulting “Metal” value only for Nature of construction and “Pile Beacon” for Beacon shape. In this case, manual filling must also be done for the missing “latticed” value on the Nature of construction attribute which is already filled with “Metal”. It is also having a difficulty to filter the “latticed” BCNSHP which is converted into a “Pile beacon” to be converted to a “Beacon tower” manually.

Attributes - BCNSPP		Attributes - BeaconSpecialPurposeGeneral	
Scale minimum	120000	Beacon shape	pile beacon
Beacon shape	lattice beacon	Category of special pu	general warning mark
Category of special p	general warning mark	(New Category of spec	
Colour	white	Colour 1	white
Colour pattern		(New Colour 2)	
Condition		Colour pattern	
Conspicuous, radar	radar conspicuous (has r	Condition	
Conspicuous, visual	visually conspicuous	Elevation	
Date end		(New Feature Name 1)	
Date start		Fixed Date Range	
Elevation		Height	
Height		Marks navigational - S	
Marks navigational -		Nature of construction	metal
Nature of construction	metal		

Justification and Impacts

The loss of lattice information due to changes to the Nature of construction will increase the conversion workload and feature encoding errors may occur.

If it is not possible to keep the Lattice beacon as the encoded value of the BCNSHP attribute in the Beacon Special Purpose General attribute as encoded on S-57, then alternatively, it is recommended to carry out the conversion automatically.

Conclusion and Recommendation

- To keep the Lattice beacon as the encoded value of the Beacon shape attribute in the Special Purpose General Beacon feature, in other words, latticed will not an encoded value in the Nature of construction. This solution will make conversion easier because cartographers do not need to fill in the Beacon shape in the S-101 feature manually.
- Based on the definition of Beacon tower, it is recommended to automatically convert BCNSHP Lattice to Beacon tower by considering the VERLEN value in BCNSPP.
 - If VERLEN ≥ 10 meters, it will be automatically converted into a “Beacon Tower”.
 - If VERLEN < 10 meters, it will be automatically converted into “Pile beacon”.
- Based on the multiplicity type according to DGEG 1.1.0 on the Nature of construction attribute, it is recommended that the Latticed Attribute shall not loss when converting to S-101. For example, if a latticed BCNSPP has NATCON “Metal” on S-7, it will be converted automatically to Beacon Tower with Nature of construction “Metal”, and “Latticed” on S-101, this will make it searchable or filterable for any amendments.

Action Required of ENCWG

The ENCWG8 is invited to:

- discuss the paper.
- consider the recommendations.
- decide on the next steps forward.