Paper for Consideration by HSSC16

Challenges in ensuring an harmonised approach in S-1xx product data

Submitted by:	Germany on behalf of WENDWG
Executive Summary:	This paper addresses potential issues if S-100 Date Services applicable to the same area may use different data provision approaches
Related Documents:	Primarily S-98 and S-164 (potential impacts on S-101, S-102, S-104), S-100 Edition 5.1.0
Related Projects:	WEND100-principles work; S-100 ecosystem development

Introduction/Background

The data models used by S-100 compliant products allow the widest possible flexibility to provide information. Cross-product harmonisation is neither defined on national nor on international level.

S-98 defines rules applicable to certain data elements if their interpretation depends on similar reference systems.

Experimenting with several S-100 products, Germany detected potential interpretation conflicts between adjacent data sets if no harmonisation is conducted.

Analyses/Discussion

1. Vertical coordinate reference systems

In S100, several sections describe the harmonisation of vertical datum information:

- vertical datum information a data set level (section 10a-6.2.2.6 Vertical Datum field structure for all ISO/IEC 8211-conformant data sets, such as S-101)
- encoding rules for 3-dimensional spatial objects (section 10a-7.2.3.1 "… if 3D-coordinates are used for the Multi Point they must all refer to the same Vertical Datum")
- rules for gridding data such as S-102 or S-104 (section 10c-9.7.1. "… an attribute value assigned in the feature instance group overrides the value in the higher group. At is further specified that this rule also applies to the "Vertical datum reference" (verticalDatum) attribute from the Root group." The list of possible attribute values is defined in section 10c-10.6 Table 10c-25.

In S-101, vertical coordination reference systems are attributes of certain features, such as Wrecks, UnderWaterRocks, DepthContours. A list of possible vertical coordination reference systems is defined in the Feature catalogue. The metadata feature SoundingDatum and associated encoding rules apply in the case of different vertical coordination reference systems within one dataset.

S-102 does not provide rules on the provision of a particular vertical datum. S-102 also doesn't provide an option to use different vertical coordination reference systems. This option is needed to provide depth information for sea areas in locks and both sides of a lock.

S-104 defines for water level adjustment that "The vertical datum must be consistent with the bathymetric CRS in S-102."

S-98 specifies in Ed 1.0.0 Annex C, App. C-4 for „User Selected Safety Contour and Water Level Adjustment" the implementation rules for vertical reference systems.

In advanced interoperability mode, S-104 feature attribute values may substitute S-101attribute values of the same feature; see S-98 Annex C, App. C-4, Chapter C-4.3.1.3. The seamless presentation of depths information would require identical vertical reference systems for both S-101 and S-104 features. It is not clear to us whether this request is specified somewhere sufficiently.

2. Provision of NPUB based information

Based on interventions from several HOs, textual information can be provided in many different ways.

Used data model elements	Results
Ex S-57 data model elements (information, textualDescription)	• Possible screen clutter by many "I" symbols • No possibility to search for particular content • No machine readability • No possibility to implement decision tools • No automated alarms, indications • No possibility to autofill templates etc.
Full data model (recommendation, restriction, regulation, contactDetails, address)	• Appropriate portrayal possible • Enhanced content search possible • Content is machine readable • Possibility to implement decision tools • Generation of alarms and indications possible • Autofill of templates possible

Based on the current NPUB data model, encoders may use different methods to provide NPUB content in S-100 products. Either they are deploying the full potential of the advanced data model or they are using the simplified approach and continue with the data model elements already available in S-57.

Both methods have pros and cons. Encoders should carefully consider which method suits both the available data source and the intended data usage best. However, employing the full data model will offer the most benefits for the end user.

The end user will not affected negatively with interpretation challenges if a HO is using one version consistently. The challenge starts if the information is modelled differently in neighbouring datasets. This phenomena may appear in the area of responsibility of one HO. It is more likely to appear in cross border situations.

The worst case scenario would be if a particular information is encoded differently and the end user does not know how to handle the situation or is uncertain if an information is still applicable.

Recommendation

1. Vertical coordinate reference systems

BSH recommends WENDWG to approach the responsible technical Working Groups via IRCC/HSSC to discuss and consider whether additional specification are needed to ensure that all relevant depth data use the same vertical reference. WENDWG should recommend making this request visible in the S-100 framework.

BSH also recommends that the request to use an identical vertical reference system by multiple products covering a particular area should be provided in S-11 Part C (to be confirmed) *"GUIDANCE FOR THE PREPARATION AND MAINTENANCE OF ELECTRONIC NAVIGATIONAL DATA SERVICES (other than S-101ENC)"*

2. Provision of NPUB based information

BSH recommends that the NPUB product specifications should contain advice on how to use the various modelling options. It should be emphasised in particular that it is necessary to provide harmonised data model if information is valid beyond the dataset limit.

Justifications and impacts

It is essential that depths information providing products have the same vertical reference system.

Furthermore, it is beneficial for the end user if the information of features crossing product boundaries is using the same data model elements.

Noting that all S-100 developments are in testing phase, no official data sets have been produced yet. Any effort to harmonise data provision at this stage has no negative impact on HOs workload.

Action required of HSSC16:

The HSSC16 is invited to:

a. Note the paper,

b. Consider the potential issues,

c. Initiate implementation in relevant S-100 Product Specifications,

d. Note to provide the same data model elements if information is applicable cross product boundaries in S-11 Part C (to be confirmed)