

Paper for Consideration by S-100WG / S-102PT**[Applicability of the S-102 PS for data producers]**

Submitted by:	BSH (Germany)
Executive Summary:	The future version 2.0.0 of S-102 requires a critical reflection with regard to its applicability for data producers.
Related Documents:	Smith, Shep M. LT; Alexander, Lee; and Armstrong, Andy, "The Navigation Surface: A New Database Approach to Creating Multiple Products from High-Density Surveys" (2002). International Hydrographic Review. http://scholars.unh.edu/ccom/976 ; S-102 Edition 1.1.0
Related Projects:	

Introduction / Background

In context of our running projects to provide high-resolution bathymetric data for the pilots and traffic control centres as well as to combine bathymetric data with water level or water level forecasting data we have been dealing intensively with characteristics of bathymetric data and their requirements for some time.

In our point of view the present draft of the S-102PS is not a sufficient basis for the production and delivery of bathymetric data for the mariners yet.

The document "The Navigation Surface: A New Database Approach to Creating Multiple Products from High-Density Surveys" listed in S-102PS arises some important questions concerning data capturing and data processing aspects, which we want to discuss.

Furthermore we think that the document structure of S-102PS isn't appropriate yet to separate and to define the data requirements for the different applications unambiguously.

Analysis/Discussion

The production process from the surveying of the seafloor up to the delivery of bathymetric data for the mariner comprises a lot of individual process steps, which generate intermediate data products of different characteristics. Depending on the respective organizational structure of a Hydrographic Office, those intermediate data products can be created by different organizational units and must be exchanged between the units without any data lost. However, the product for the mariner should be a data product with a generalized and an interpretable content.

What we expect of a PS for bathymetric data are clear and comprehensive definitions and rules in order to be able to create safe data products for the mariner and for other users as well.

From the above mentioned scientific paper we can extract some interesting questions such as the following:

1. What exactly do we understand by a "Bathymetric surface" respectively by a "Navigation surface" – seafloor including all underwater obstructions or without them?
2. Are they (Bathymetric surface / Navigation surface) perhaps different and are they a full resolution, scale-independent DTM or a scale-dependent DTM?
3. Which methods should be applied for uncertainty computation – differentiated according to surveying method – single-beam and multi-beam?
4. Is it really helpful for the mariner to have an information for the uncertainty or would it be better to get an information for the reliability of the depth? And how is the relation between uncertainty in S-102 and reliability (M_QUAL, M_SREL) in S-101? How can we provide the uncertainty for the mariner as useful information?

Certainly there are still some other issues depending on the specific workflows, which are also essential for the production side. We have not even asked questions concerning the important metadata like measuring date or surveying method. But they should also be considered in the next version of S-102 PS, because the metadata are needed for the traceability of the production workflow and for a quality-compliant production.

From our perspective we should find the answers to the relevant questions and include them into the next PS.

Concerning the user aspects and the applicability of the PS for a SOLAS compliant navigation is it important to detect and to keep in mind issues of the interoperability between the S-101 and S-102.

As we pointed out at the outset, the document structure doesn't make it possible to differentiate the content into data processing aspects and end-user aspects. So we cannot recognize the real intention of this PS. The PT agreed in Genoa (2017) that the primary scope of the S-102 product specification (v2.0.0) is safe navigation of maritime vessels. In this context we very much welcomed the idea to turn away from BAG format. But this step has not yet been accomplished. The described UML data model and data content still correspond basically to the BAG format and comprise especially data capturing and data processing aspects, such as the tracking list for the hydrographer.

Conclusions

The present PS is not applicable for a safe navigation yet.

We need further discussions about the intention of the PS and the posed questions.

Recommendations

The data producers need a common understanding of the relevant components of the PS. Therefore we suggest to design a general production workflow as a basis for the next version of S-102PS.

We propose to discuss a better document structure for the next version of the S-102.

Justification and Impacts

For a S-102 PS, which aimed to provide bathymetric data for a safe navigation, we need more clarity about the terms and definitions and more structure in the document. Otherwise we would get inconsistent, not interoperable data products.

Action Required of ENCWG

The S-100WG - S-102PT is invited to discuss the issues and to decide the appropriate steps.