

Paper for Consideration by S-100 WG**Separating the S-102's Product Specification by Purpose: Navigation and Data Exchange**

Submitted by:	Canadian Hydrographic Service
Executive Summary:	Outlining a justification for separating the S-102 product specification into 2 specs, one for navigation and a second one for data exchange.
Related Documents:	S-102 Product Specification, S-100 standard.
Related Projects:	Any related projects that may impact upon considerations

Introduction / Background

When the S-102 product specification was devised its original intent was as a method for incorporating high definition bathymetry with existing ENC datasets. This would provide mariners with the data to choose a more precise safety contour, which in turn allows them to maximize their loads but still safely navigate waterways.

To advance the development of this product spec, the BAG format was chosen as the basis for this product spec as it was a known method of exchanging high volumes of Bathymetric grid based datasets.

Although while being developed it was clear there was 2 main uses for S-102 data (navigation and data exchange), the primary focus of S-102ed 2.0 was to ensure that it was ready for navigational use, and be interoperability with S-101 ENC datasets. However because it has two uses, there are several instances where additional attribution and/or functionality was required within the specification to accommodate both use cases, which are complicating the generation of S-102 datasets. Complicating the generation of the datasets not only for data producers but for equipment manufactures as well who's only concern is navigation.

Analysis/Discussion

There are several portions of the S-102 specification that have either 2 sets of attribution depending on the intended use of the data or have specific constraints or functionality that is needed for one use case but not the other. For Example:

1. Maximum dataset size.
For Navigation the maximum size of a single dataset is set at 10MB
For data exchange purpose the maximum size of a single dataset is 256MB
2. Section 4.2.2 Tiling Scheme (Partitioning)
Tiling schemes are very useful for large datasets as they allow the software to zoom in and out of datasets without having to load extremely large amounts of data at one time, however for navigation with the maximum dataset size set to 10MB, tiling schemes are not really required as this is covered by the creation of individual datasets. However for data exchange datasets (256MB), tiling schemes will become very important to aid software and equipment to manage the data being displayed.
3. Tracking lists
Tracking lists were devised to keep track of over-written nodes, to support things like designated soundings. A tracking list in essence allows one to see elements of

a dataset's history, which may be important for data exchange but for navigation this is not required, only the final surface/grid is needed for navigation. The mariner only cares that he has the latest and greatest data, the data's history is irrelevant to the mariner. Thus sections 4.2.1.1.8 → 4.2.1.1.9.5 of the S-102ed 2.0 specification are only relevant to the data exchange use case.

The inclusion of track lists in a navigational S-102 dataset will significantly complicate an OEM's implementation as they must be able to ingest every element of the standard even though this aspect is completely irrelevant for navigation.

4. Meta data elements have 2 purposes Section 12

Many of the Mandatory metadata elements are required to be filled out such that you must populate either S102_DS_DiscoveryMetadata elements or S102_tile_DiscoveryMetadata elements. Simplifying the use case of the standard will minimize the metadata components.

5. S-100 definition

The S-102 spec currently contains elements not defined in S-100 such as Tracking List. The spec should not contain definitions that cannot conform to S-100

In every other case of multiple use case for a potential product specification the S-100 WG has created separate product specifications or have stated they would make use of separate product specifications for different uses.

- The S-401 Inland ENC specification was created to avoid adding inland specific features to the S-101 specification.
- And although Notice to mariner content is very similar to Navigational Warnings it has already been recommended that if and when Notice to mariners becomes an S-100 based spec, it will not be added to S-124 Nav Warnings.

Conclusions

Where a product specification has more than one use case and it is essential to maintain completely separate features and or metadata within the product specification to differentiate each use case, then this is justification for the creation of separate product specifications to support each use case.

Recommendations

It is recommended that the S-102 product specification be focused on the navigational use case and that a secondary S-100 based product specification be created to support data exchange. It is further recommended that for the next version of S-102 (Ed2.1) that data exchange specific elements be stripped out of S-102 in order to focus on navigation requirements and to meet HSSC agreed timelines for advancing the S102 specification.

Justification and Impacts

By stripping out the data exchange elements from the S-102 product specification the overall implementation of OEM software will be greatly simplified and remove some of the inconsistencies within the S-102 implementation

The resulting impacts would be as follows:

- Would require a small team to edit the S-102 v2 prod specification and create a redline version with the identified Data Exchange aspects removed – **The Redline version has been drafted and the S-102 PT has begun their review of that version already.** (See Attached Redline version)
- Add an additional item to the S-102 PT work plan to create a new S-10X Data Exchange product spec, making use of the current S-102 v2.0 specification to create edition 1.0. This work item would commence post completion of S-102 Ed 3.0, in order to ensure S-102 is compliant with S-100 Ed 5.0. prior to constructing S-10x.

If this proposal is accepted then, the S-102 PT will finish the review of the red lined navigation only version of the product spec at their next meeting March 8th-9th, 2021. And the addition of the S-10X Data Exchange product specification will be added to the S-102PT work plan.

Action Required of S-100 WG

The S-100 WG is invited to:

- a. Discuss the merits of this proposal
- b. consider endorsing this proposal for the separation of the S-102 product specification into 2 product specifications (Navigation and Data Exchange)