

Subject: S-102 Project Team Breakout Sessions (16 & 18 March, 2017).  
Location: Grand Hotel Savoia, Genoa, Italy

1. **Executive Issues:**

- In conjunction with S-100 Working Group meetings the S-102 Project Team conducted multiple breakout sessions on 15 and 18 March, 2017.
- The project team focused on two topics:
  - S-102 Portrayal
  - Proposed S-102 improvements submitted by PRIMAR (S-100WG2-10.11).

2. **Attendees:**

16 March 2017:

- David W Brazier (United States)
- Janice Eisenberg (United States)
- Mikan Stamenkovich (United States)
- Patti Parkhouse (Canada)
- Jana Vetter (Germany)
- Christian Mouden (France)
- Svein Skjaeveland (PRIMAR)

18 March 2017

- David W Brazier (United States)
- Janice Eisenberg (United States)
- Mikan Stamenkovich (United States)
- Svein Skjaeveland (PRIMAR)
- Marc Roesbeke (Belgium)
- César Reinert Bulhões de Morais (Brazil)
- Holger Bothien (SevenCs)
- Edward Kuwalek (IIC)

3. **Background:**

- S-102 Version 1.0 was approved by IHO member states in April of 2012.
- Efforts to draft S-102 Version 2.0 have been ongoing since 2015.
- During the S-100 WG2 meeting the S-102 project team lead briefed a status update on S-102 version 2.0
  - Status Brief included conceptual portrayal options including automated sounding selection and contour generation.

4. **Meeting Minutes:**

**a) Breakout Session 1 (16 March 2017)**

- i. **S-102 Portrayal:** The project team discussed the conceptual portrayal options (contours and soundings) proposed during the S-102 Status Brief. The group acknowledged that that it was possible to automatically generate contours and soundings from the S-102 dataset, but were in full agreement that S-102 portrayal should focus solely on visualization of the gridded dataset. Generation and display of contours and soundings are not a desired capability for the following reasons:
  - Impossible for the HO to validate platform derived contours and

- soundings.
- High legality concerns without the ability to validate.
- Several group members noted that is nothing stopping an HO from increasing contour density on the charting product.

**Decision:** *Modify S-102 Version 2.0, Clause 9.0 to focus solely on portrayal of the S-102 gridded dataset (Depth and Associated Uncertainty).*

- ii. **S-102 Dataset File Size:** The group briefly discussed concerns that the 10MB file size limit was too small. Multiple members stated that modern gridded surfaces are typically a few 100 MBs in size, with some files reaching 2GB.
  - PRIMAR suggested increasing the file size limit to at least 500MB.
  - Further discussion tabled until the 18 March Breakout session to obtain additional feedback from absent project team members.
- iii. **Topics Tabled for 18 March Meeting:**
  - Who has the authority to produce and S-102 surface?
  - How to handle file versioning?
  - Potential scientific use cases.

#### **b) Breakout Session 2 (18 March 2017)**

- i. **S-102 Product Specification Scope:** Prior to breakout session 2 the project team lead was provided valuable feedback from CARIS and CHS. CARIS noted that the S-102 spec lacked focus and was being pulled in multiple directions. In response to this observation the group revisited the scope of the project. Multiple use cases were identified:
  - Navigation
  - Precision navigation (bathy ENC)
  - Scientific
  - Fisheries
  - Dredging
  - Oil/gas infrastructure
  - Military
  - Protected areas

**Decision:** *Group members agreed that the S-102 Product Specification should focus primarily on Navigation use cases only. Scientific use cases, while valid, are not currently the focus of this product specification.*

- ii. **S-102 Portrayal:** As discussed during the first breakout session, the conceptual portrayal options briefed to the S-100WG scaled back. The group was in full agreement that S-102 portrayal should focus solely on visualization of the gridded dataset.

**Decision:** *Modify S-102 Version 2.0, Clause 9.0 to focus solely on portrayal of the S-102 gridded dataset (Depth and Associated Uncertainty).* **ACTION: David Brazier**

- iii. **S-102 Portrayal Cont.:** During portrayal discussions Mr. Kuwalek noted that it was important to first verify that the S-100 specification contained the required information to support the portrayal of a gridded surface. Following a review of part 8 the group determined that the S-100 specification contained the required information to support the display of an S-102 surface.

Discussions then focused on what should be portrayed. The following talking points were discussed:

- Coverage fill options. Do we define a single coverage scheme, or should we also focus on the display of safe and unsafe waters.
  - *Future Question: Is there a way to trigger alarms from grid nodes?*
- Display of data quality. The group noted that there are multiple methods available to display data quality. At this time static visualization is the preferred method (text or colour based?). Once the group has successfully portrayed an S-102 surface additional effort can be focused on data quality.
- Need for vertical checks to ensure datum match between S-101 and S-102 products.

**Decision:** *US, Naval Oceanographic Office (NAVOCEANO) is going to develop a script to extract and replace BAG metadata with S-100 compliant metadata. This script will provide the capability to produce an actual S-102 file. NAVOCEANO intends to transfer this script to the IHO for distribution to member states. **ACTION Stacy Johnson (NAVOCEANO).***

- **The remainder of the meeting focused on proposed S-102 improvements submitted by PRIMAR (S-100WG2-10.11).**

- iv. **S-102 Metadata:** Draft version 2.0 of the specification is currently aligned with “Redlined” S-100 version 3.0.
- The S-102PT Lead will review the current metadata requirements and determine whether all metadata is currently captured by BAG version 1.6.
  - Should any additional metadata need to be captured by BAG, Dave Brazier (NAVO) and Janice Eisenberg (NOAA) will liaise with the Open Navigation Surface Working Group (ONSWG) to determine whether additional fields may be added to the BAG specification.
- v. **S-102 Coordinate Systems:** PRIMAR noted that version 2 of the specification states that S-102 surfaces can be produced in any projected coordinate system. They expressed concern that having such a wide selection of coordinate systems would create unnecessary challenges for OEMs.

The group decided that a limited number of CRS should be allowed for S-102 datasets, with approved CRS's defined with ESPG code. The group also noted that there is a need to include projections commonly used for polar regions. There should be included transformation parameters in metadata when necessary.

**Decision/Action:** *Modify Clause 5 and Annex A (Table A2) to support this decision.*

- vi. **S-102 New Edition Coverage:** The group discussed how to avoid confusion for end users when issuing new editions of S-102 data. PRIMAR proposed that new editions should cover the same area as the superseded edition.
- The group discussed the pros/cons of this suggestion and ultimately agreed that new editions should cover the same areas as the previous edition.
  - The group further discussed the need for a tiling scheme to help with dissemination. Multiple group members offered to investigate potential tiling schemes for S-102.
    1. Janice Eisenberg
    2. Svein Skjaeveland
    3. Marc Roesbeke

**Note: If anyone else would like to participate with this effort please let me know.**

- vii. **S-102 Cancel Cell Mechanisms:** The spec fails to discuss the potential reuse of cancelled datasets. There should be added a clause clarifying that the name of a cancelled dataset cannot be reused at a later stage

The group decided that edition versioning should be carried individually within every S-102 dataset as opposed to the S-102 exchange set. This will enable better compatibility with data handling and distribution services.

**ACTION:** Add following text in 11.2.1/11.2.2: Reuse of a cancelled datasets file name is prohibited.

**ACTION:** Review metadata to determine if additional fields are needed to capture S-102 versioning.

- viii. **S-102 File Name Suffix:** There was a lot discussion both in the S-100WG and the S-102PT on file naming. For the time being the group decided to stick with the current naming convention identified in the S-102 Specification.

- ix. **S-102 File Size:** Section 11.2.1.1 Dataset Size (Draft version 2.0) identifies two file sizes: 1) 10MB limit for transmission of S-102 data, and 2) 256MB for physical media transfer.

As covered from the first breakout session, group members expressed concerns that the 10MB and 256MB file sizes were too small. Multiple members stated that modern gridded surfaces are typically a few 100 MBs in size, with some files reaching 2GB.

Without an actual S-102 dataset to test with group members agreed to work on defining minimum “suggested” grid sizes for each display scale identified in Table 3.1 of the Draft Version 2.0 Specification. This effort will be coupled with the effort to develop a tiling scheme to reduce file sizes.

Group members supporting this effort:

1. Janice Eisenberg

2. Svein Skjaeveland
3. Marc Roesbeke

**Note: If anyone else would like to participate with this effort please let me know.**

- x. **S-102 Safety of Navigation:** The group discussed the various gridding methods utilized by HO's in support chart production and whether all gridding methods are valid for S-102 production. After some discussion members agreed that S-102 producers should keep safety of navigation in mind when creating an S-102 datasets, but they should not be restricted by the specification to specific gridding algorithms.
- xi. **S-102 Display and Portrayal:** The project team determined that two portrayal schemes should be defined:
  - A colour ramp for replacing skin of the earth features.
  - A two-colour scheme depicting safe/unsafe waters based on mariner provided context parameters.

Future discussions on interaction between S-102 and S-101/other S-100 data will take place during the S-100 interoperability analysis.

- xii. **S-102 Digital Signature:** IHO Data Protection Scheme Working Group (now a Project Team under S-100WG) will define a data protection scheme for S-100 products. The project team decided to align the development of the PS data protection part with the ongoing data protection work being carried out for S-100. In that way S-102 2.0.0 will be proof of S-100 data protection scheme.
- xiii. **Submission to HSSC:** The group decided to postpone submission of S-102 Version 2.0 until HSSC9 (June 2018). This decision was discussed verbally with S-100WG chair and provides an additional 6 months to complete portrayal.

## 5. **Actions:**

- Modify S-102 Version 2.0, Clause 9.0, removing automated sounding selection and contour generation. (David Brazier, NAVOCEANO) – April 30, 2017.
- Develop a script to extract and replace BAG metadata with S-100 compliant metadata to produce an S-102 file. (Stacy Johnson, NAVOCEANO) – June 30, 2017.
- Modify Clause 5 and Annex A (Table A2), defining approved Coordinate Reference Systems (David Brazier, NAVOCEANO) – April 30, 2017.
- Add following text in 11.2.1/11.2.2: Reuse of a cancelled datasets file name is prohibited.
- Review metadata to determine if additional fields are needed to capture S-102 versioning. Provide feedback to the project team for review. (David Brazier, NAVOCEANO and Janice Eisenberg, NOAA) – May 31, 2017.
- Based on results from metadata review, liaise with the Open Navigation Surface Working Group (ONSWG) to determine whether additional fields may be added to the

BAG specification. Work with ONSWG to better align BAG and S-100 metadata where possible (David Brazier/Stacy Johnson, NAVOCEANO and Janice Eisenberg, NOAA) – Aug 30, 2017.

- Define minimum “suggested” grid sizes for each display scale identified in Table 3.1 of the Draft Version 2.0 Specification (Eisenberg, Skjaeveland, Roesbeke) – Aug 30, 2017
- Investigate potential tiling schemes for S-102 datasets. Provide feedback to the project team (Eisenberg, Skjaeveland, Roesbeke) - Aug 30, 2017