8th HSSC MEETING

Monaco, 14-18 November 2016

Report of the S-100wg to HSSC 8

S-100 Working Group

Submitted by:	Chair, S-100wg
Related Documents:	List of Actions HSSC8-03B HSSC5-05.1D Regulatory process associated with the implementation of S-100 based products and services
Related Projects:	NA

Chair:	Julia Powell, NOAA
Vice Chair:	Yong BAEK, KHOA
Secretary:	Eivind Mong, Jeppesen
Member States:	Argentina, **Australia**, Belgium, **Brazil**, **Canada**, **China, Denmark,** Ecuador, Egypt, Estonia, **Finland**, **France**, **Germany**, India, **Italy**, **Indonesia, Japan**, **Republic of Korea**, **Netherlands, Norway**, Poland, Portugal, **Russian Federation,** Singapore, South Africa, **Sweden**, **United Kingdom**, Ukraine, **United States of America**.
Expert Contributors:	**The International Centre for ENCs (IC-ENC)**, **PRIMAR Stavanger**, **Caris**, **ESRI (USA)**, **Furuno (Finland)**, **Furuno Electric**, **KRISO, KHRA**,GEOMOD (France, **C-Map**, **IIC Technologies (Canada)**, NAVTOR AS (Norway), **SevenCs (Germany)**, TKartor (Sweden), and **Transas (Russia)**, Frank Hippmann (Australia), **Wuhan University**

1 Meetings Held During Reporting Period

a. S-100WG01 – 14-18 March 2016, Tokyo, Japan
b. S-100/S-101 Focus Group Meeting: 13-16 September 2016, Rostock, Germany

2 Work Program

Progress continues on the work items assigned by HSSC7 as follows:

2.1 Maintain and Extend S-100 "IHO Universal Hydrographic Data Model" (A.1)

Since the publication of edition 2.0.0 of S-100 there have been nineteen proposals that clarified, corrected or extended S-100. Of these nineteen, seventeen were accepted by the working group for inclusion into edition 3.0.0 of S-100. They are as follows:

#	S-100 Part	Part Name	Brief Description	Type	Status/Comment
1	7	Spatial	Clarification on internal and external boundaries for areas with holes	Clarification	Accepted
2	4A	Metadata	S100_Support File Format (add Tiff)	Clarification	Accepted
3	4A	Metadata	Invalid Reference to a clause that does not exist	Correction	Accepted
4	9C	SVG Profile	Draft profile of SVG elements that are used in the creation of S-100 symbols	Extension	Accepted • This is needed for the S-100 portrayal mechanism as it defines the symbol format
5	11	Product Specification	Clarifies the rules for namespaces for product specifications	Clarification	Accepted
6	10C	HDF	Adds HDF as an encoding format for S-100	Extension	Accepted • This is needed for S-100 Product Specifications that utilize gridded formats such as S-102 and S-111
7	Cover	Cover	Amends the copyright note	Clarification	Accepted
8	10A	8211	Needed to amend the 8211 to handle a conditional need for the SEGH field	Correction	Accepted
9	5	Feature Catalogue	Adds in Dataset Attributes to the FC model	Extension	Not Accepted • An alternative method was proposed and accepted using the 8211 encoding
10	9	Portrayal	Correction of editorial issues	Correction	Accepted
11	4A	Metadata	Exchange Catalouge Metadata harmonization and include the S-101 data coverage methodology	Correction	Accepted
12	5	Feature Catalogue	Feature catalogue model and schema extended to include roles in information bindings	Extension	Accepted
13	10b	GML	Place existing description of associations in a sub-section and add a second sub-section describing an	Extension	Accepted

			alternate method for encoding feature and information associations		
14	2B	Portrayal Register	Inclusion of the Portrayal Register Model into S-100	Extension	Accepted
15	9	Portrayal	Modification for pointSet/Multipoint features	Correction	Not Accepted • Deferred until more testing could occur and the Portrayal Catalogue Builder is functioning
16	4A	Metadata	PDF as a support file format	Extension	Accepted
17	5	Feature Catalogue	Clarification on the use of supertypes	Clarification	Accepted
18	8	IGD	Alignment to revised ISO models	Correction	Accepted
19	4A	Metadata	Amend the definition of layerID	Clarification	Accepted

Overall, seven of the proposals were considered extensions to S-100, therefore causing an uptick in the edition number of S-100 from 2.0.0 to 3.0.0. These extensions were at the request of various product specification developers who recognized that the S-100 framework would need to be extended to incorporate these new features so that they can progress the development of those specifications. Major extensions included:

- HDF was added as an encoding format to support product specifications that use gridded data such as S-102 – Bathymetric Surface and S-111 – Surface Currents. This improves standardization, by moving the encoding to the S-100 level rather than having the product specifications define the encoding
- SVG was added as a profile to S-100. SVG is used to define symbols that will be registered in the portrayal register and utilized in the portrayal of products.
- Portrayal Register Model – S-100 was missing a formal model for how the Portrayal Register should be constructed.

Edition 3.0.0 was finalized after S-100WG1 in March and then sent out for a stakeholder review and comment in July. Comments were adjudicated at the S-100 Focus Group meeting in September 2016 and the resultant S-100 Edition 3.0.0 has been submitted to HSSC8 for approval with a goal of MS approval in early 2017 for publication.

In accordance with TR 2/2007, S-100 edition 3.0.0 was sent out to both member states and to other stakeholders for a final review. As a result of this review, the S100WG received 43 comments from the following stakeholders: NOAA, SPAWAR and C-MAP. These comments were resolved at the S-100 Test Strategy Meeting held from September 12-16. The majority of these changes will improve the usability of S-100 for product specification developers.

Since S-100 provides the framework to develop S-100 based product specifications it cannot be tested in the traditional sense. Instead, it forms the basis for the S-100 test bed which will be used by S-100 based product specifications to test against. Once S-100 Edition 2.0.0 is approved then items such as the S-100 GI register, Feature Catalogue Builder and Portrayal Catalogue Builder will need to be updated to the revised models contained within S-100 and undergo testing prior to public release.

Impacts to S-100 based product specifications, S-100 GI Register, Feature Catalogue Builder and Portrayal Catalogue Builder

Because product specifications are tied to particular editions of S-100 and past versions of S-100 are never retired there are no impacts to existing S-100 based product specifications. Currently, S-102 – Bathymetric Surface Product Specification is the only product specification that has been developed to S-100 (Edition 1.0.0). S-102 is in the process of undergoing an update to include portrayal capability and will utilize HDF5 encoding – which is available in S-100 Edition 3.0.0.

All other IHO S-100 based product specifications and non-IHO product specifications under development by IALA and the WMO are waiting for the release of Edition 3.0.0 to make any further progress as they all require various corrections and extensions that are included in this new edition.

As a result of S-100 3.0.0 the following external applications that have been developed as part of the S-100 infrastructure will have to be updated:

- S-100 GI Register (NOTE: The Portrayal Register Model has already been developed under contract from the IHB)
- S-100 Feature Catalogue Builder (NOTE: KHOA has already started updating the FCB to concepts in 3.0.0)
- S-100 Portrayal Catalogue Builder (NOTE: this still needs a general update to 2.0.0 and edition 3.0.0 does not have any changes that will affect the PCB)

However, updating these applications will not impact any existing S-100 based product specifications as these applications are designed to be able to maintain items to different editions of S-100.

ACTION REQUIRED: HSSC8 approve S-100 Edition 3.0.0 and forward to Member States for approval.

In addition, the S100WG anticipates publishing edition 4.0.0 of S-100 in 2019. This will include proposals from IALA to include session oriented services and other items that may result from the S-100 Test Bed and other product specification that are under development. Therefore it is **recommended that the workplan reflect that edition 4.0.0 will be submitted to HSSC in 2018 and that HSSC investigate establishing a standards development and maintenance regime to normalize the process.**

2.2 Development of an S-100 Interoperability Specification (A.2)

It was recognized by the S100WG that there needed to be an S-100 Interoperability Specification for use in navigation systems that will harmonize the portrayal of different types of datasets. The initial draft was delivered in August and reviewed by the S100 Focus Group in September. This specification will be incorporated into the S-100 Test Bed so that it may be refined. Currently, it anticipated that it will be finalized in conjunction with S-101.

2.3 Maintain and Extend the S-99 "Operational Procedures for the Organization and Management of the S-100 GI Registry (B.1)

Work has not been started on implementing the following HSSC6 action:

HSS6/16: S-100WG to implement the proposal of TSMAD related to the registration of Product Specifications and to draft the appropriate changes to the S-100 GI registry and S-99.

This is due to the ongoing work in 2016 to update the IHO Registry to make it operational.

It is recommended that the following item be added to the S-100 workplan and the action be carried forward another year:

B.1 Update S-99 and the S-100 Registry pages for the registration of S-100 product specifications in accordance with HSSC6-05B rev1.

2.4 Update the S-100 GI Register to edition 2.0.0 (3.0.0) and re-build the web interfaces (C.1)

For much of 2016, the ROK has worked to rebuild the interfaces and functionality of the S-100 GI Registry. They have primarily focused on the Feature Concept Dictionaries so that the wider S-100 user community can begin to propose new items in support of their product specifications. The S-100 GI Registry underpins the entire S-100 infrastructure and this item has been the highest priority for the S-100 WG as it has a direct effect on the functionality of the S-100 Feature Catalogue Builder and the S-100 Portrayal Catalogue Builder.

Work on the major interfaces was completed in September 2016 and has been opened up to those developing product specifications.

In order to operate the registers according to S-99, the IHO will need to set up a Domain Control Body and an Executive Control Body.

The Domain Control Body shall consist of a representative of each of the domains recognized in each Register type and members are responsible for:

- acting as the spokesperson for their domain,
- canvassing other members in their domain for an opinion on the acceptability of any new proposal. How this is organized is at the discretion of the Domain Owners, and
- forwarding a decision to the Register Manager within 60 days.

The Executive Control Body shall consist of a representative of each of the Domains and will monitor and advise the Register Manager(s) and act as arbiters for any decisions or disputes in the Register process. In the event that a resolution cannot be achieved, the ECB may ask for the decision of the HSSC.

Because NIPWG and the S100WG have agreed to merge into a single IHO Hydro Domain, it is recommended that representatives from both groups be appointed to the Domain Control Body and the Executive Control Body.

ACTION requested of HSSC: Establish a Domain Control Body and an Executive Control Body for the IHO Registry.

2.5 Connect the S-100 Feature Catalogue Builder to the S-100 GI Register (C.2)

This work is still ongoing as the primary focus has been to stabilize the S-100 GI register. It is expected to be completed early 2017.

2.6 Develop web-interfaces to propose new symbology to the S-100 Portrayal Register (C.3)

This work has been delayed, pending the completion of the S-100 GI Interfaces for the Feature Concept Dictionaries.

In addition, once the Portrayal Register is stood up and the Feature Catalogue Builder has been connected to the GI Register work will need to be done to update the Portrayal Catalogue Builder to the new GI Register Database, as that is where the feature catalogues are stored.

ACTION REQUIRED: Add to the S100WG workplan to finalize the connection of the Portrayal Catalogue Builder to the GI Register.

ACTION REQUIRED: Explore the use of IHB special project funds to resolve any issues that may be discovered with the Portrayal Catalogue Builder once the other infrastructure issues (GI Registry, FCB) have been resolved.

2.7 Review the S-100 Master Plan Annually (D.1)

At this time there are no recommended changes to the S-100 master plan.

2.8 Review the S-101 Value Added Roadmap annually (D.2)

The S-101 Value Added Roadmap underwent a review by the S-101 Project Team. Minor edits were made to change TSMAD to the S-101 Project Team and updating the timeline. It is available at the following link: http://www.iho.int/mtg_docs/com_wg/S-100WG/S-100WG1/S-101PT/S101PT01-4.1C_S-101_Roadmap_updated_06012016_clean.pdf

2.9 S-101 ENC Product Specification (D.3)

S-101 is the new Electronic Navigational Chart product specification that is based on S-100. The intent of S-101 is to utilize the flexibility of S-100 to allow the IHO and Member States to respond to the changing needs of the mariner. S-101 will include machine readable feature catalogues and portrayal catalogues that will facilitate updating of changes to shipboard systems.

2.9.1 S-101 Progress

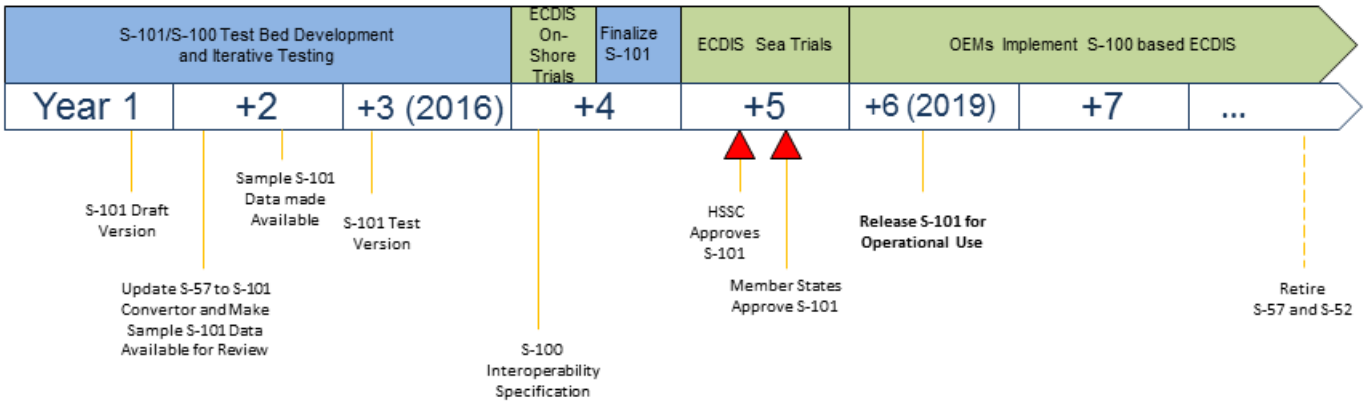
S-101 is a multi-part product specification when put together will form the basis for the creation and display of Electronic Navigational Charts. The major components of S-101 and their current status are as follows

S-101 Component	Current Status	Comment
Main Document	Testing Baseline – June 2015	• Sent out for stakeholder review in September 2014 and final comments incorporated into the testing baseline • New Items have been registered in the GI Registry.
Data Classification and Encoding Guide	Baselined – June 2016	
8211 Annex	Testing Baseline – June 2015	

		• Changes to the DCEG will undergo a controlled proposal process in order to manage change effectively.
Feature Catalogue	Testing Baseline – June 2015	• Awaiting the FCB connection to the GI Registry to create a new version that contains the new DCEG items.
Portrayal Catalogue	Partial Baseline – July 2015	• Caris has created a partial portrayal catalogue using the elements from S-52 in the S-100 format. • There is still more work to be done once the S-100 Register is operational. • NOAA has funded work on baselining the S-52 CSPs into XSLT 1.0 that will be part of the Portrayal Catalogue
Implementation Guidance	In Progress	Will continue to be refined during the S-101 test bed process
Validation Checks	In Progress	

S-101 progress has been slow during this reporting period. Much of this is due to waiting for the S-100 Infrastructure to be updated for use. Once the GI Registry and the FCB is operational a new Feature Catalogue will be created and the Portrayal Catalogue Builder will be tested to create the S-101 Portrayal Catalogue. This will then be made available on Basecamp to the S-100 Stakeholder community for testing and development.

S-101/S-100 Test Bed Timeline



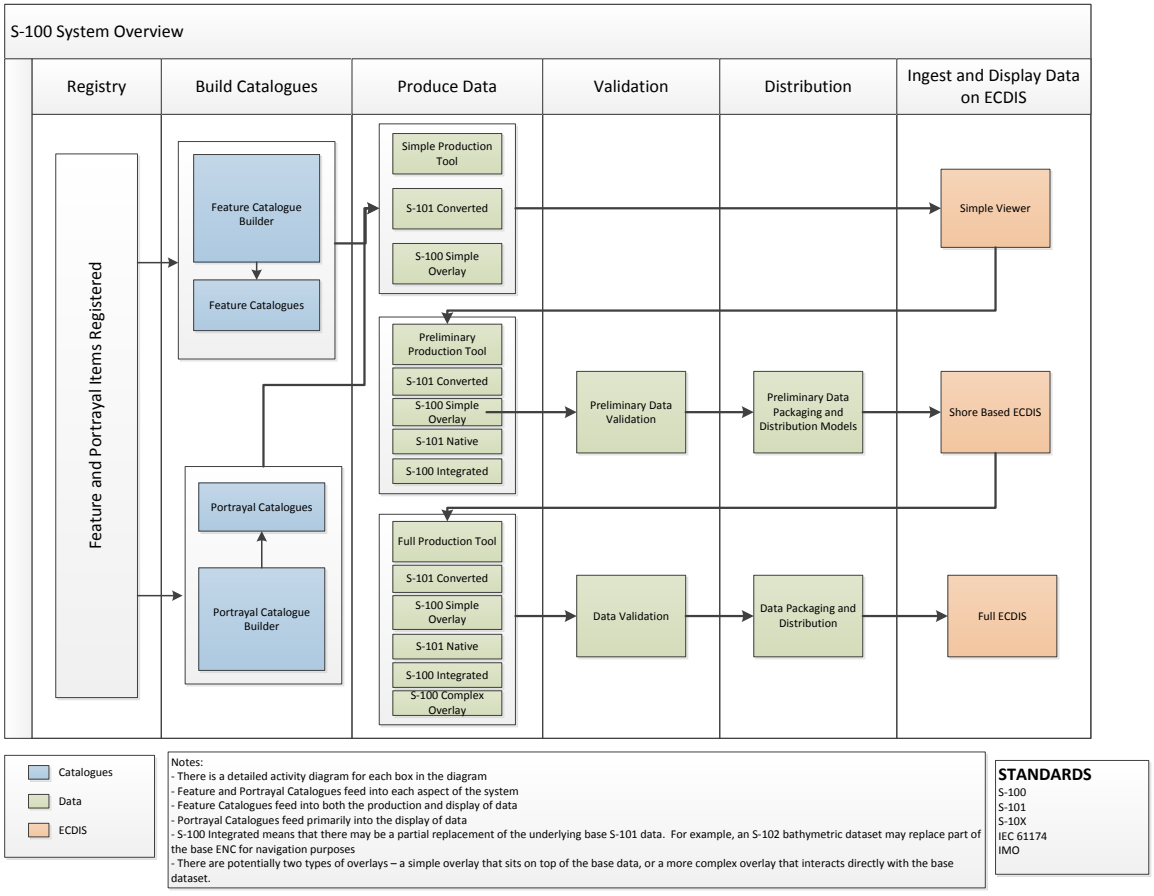
In addition, the S-100WG maintains an S-100/S-101 risk register highlights the areas where more work needs to be done and where progress is on track. Link to latest Risk Register

2.10 Monitor the implementation of the 1st draft of the S-101 Product Specification (D.4)

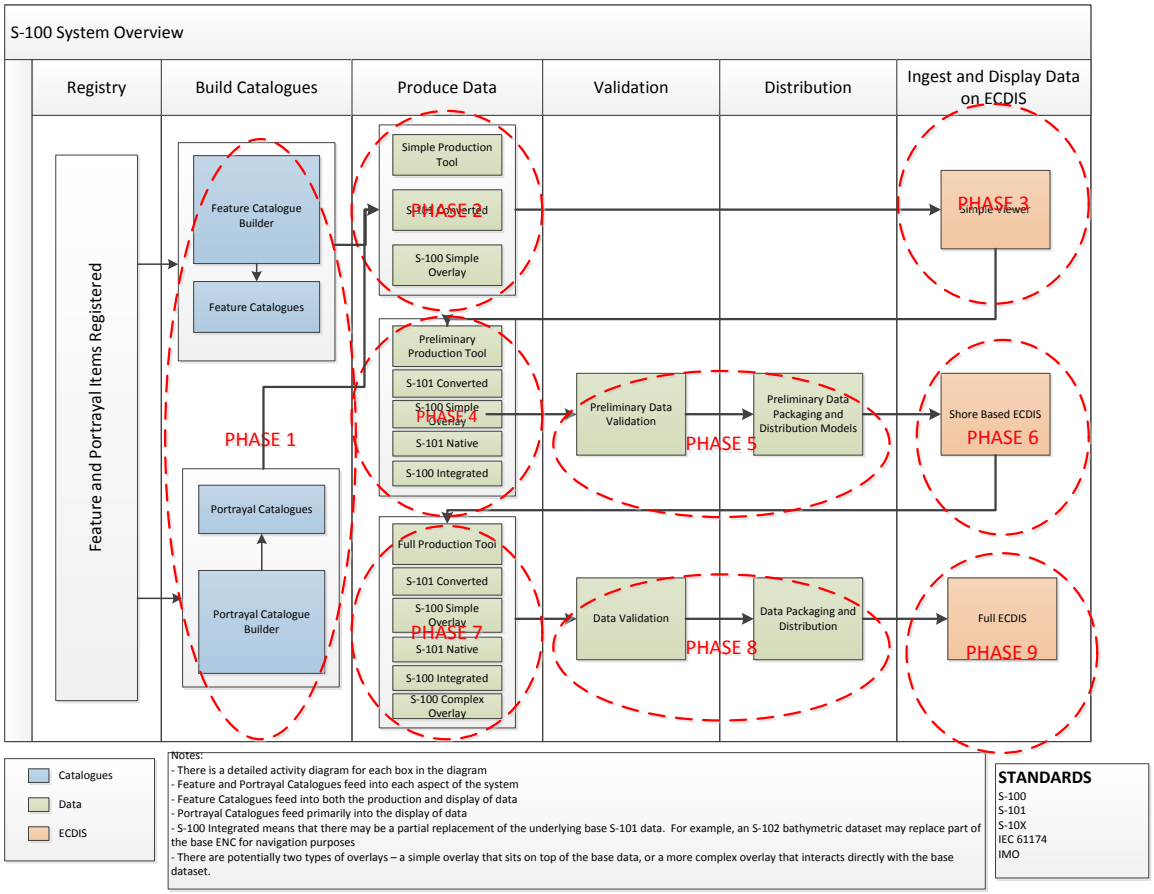
This is currently a planned activity. As the S-100 Test Bed matures, S-101 will be tested throughout each phase of the testbed.

2.11 Develop an S-100/S-101 Test Strategy and Test bed (D.5)

Before the IHO Member States can approve S-101 as a functional standard, it must undergo a rigorous testing process that will require the implementation of test bed projects. It is important to understand that these test beds will need to be S-100 based, capable of testing other product specifications which can be either supplementary to S-101 ENCs or non-related GIS applications. The overarching test bed strategy is depicted in the following figure which shows the logical progression from catalogue creation to use within an ECDIS.



However, in order to manage the complexity of the testing process it has been divided into nine phases that cover the entire end-to-end process as depicted in the following diagram.



Breaking out the testing through phases allows for the iterative development of future ECDIS as a system by gradually expanding requirements and the different types of test scenarios that are needed to validate S-101 as a functional standard.

#	Phase Name	Status	Comment
1A	Feature Catalogue Builder	Completed	• Development done by KHOA • S-100 Test Cases Written
1B	Portrayal Catalogue Builder	Completed	• Developed under IHB Contract • S-100 Test Cases Written
2	Simple Production Tool	In Progress	• S-57 to S-101 Convertor • Joint NOAA/ESRI initiative
3	Simple Viewer	In Progress	• S-100 Test Cases Written • ROK Simple Viewer • SPAWAR Simple Viewer
4	Preliminary Production Tool	In Progress	• ROK has developed a tool to produce S-101 updates for testing

5	Preliminary Data Validation and Packaging	Not Started	• Initial Scoping Required
6	Shore Based ECDIS	Not Started	• Initial Scoping Completed
7	Full Production Tool	Not Started	• Initial Scoping Required
8	Data Validation and Packaging	Not Started	• Initial Scoping Required
9	Full ECDIS	Not Started	• Initial Scoping Required

The outcome of testing will also enable a more detailed impact study, as prescribed by IHO Resolution 2/2007 on principles and procedures for making changes to IHO technical standards and specifications, and will provide a clear picture of the effects on the various stakeholders involved in the eventual introduction of S-101.

Work is still ongoing regarding the S-100 Test bed. At this time there are several S-100 simple viewers under development, such as those by ROK and SPAWAR. The latest edition of the S-57 to S-101 convertor has been released and there are several initiatives to develop additional S-101 test datasets to support functional testing. A subset of the S-100 WG meets each September to review the status of the test bed.

2.12 S-102 (D.6)

Work continues on updating S-102 to make it functional for navigation systems. The project team met during S-100WG1 in Tokyo, Japan and discussed multiple topics including product portrayal, file size limits, and navigation vs. non-navigation requirements. It was decided at this meeting to narrow the scope of version 2.0 to Safety-of-Navigation applications in order to meet the fall deadline for submission to HSSC8. Unfortunately product portrayal is taken longer than expected, delaying final submission of version 2.0 until HSSC9. The following is a breakdown of work remaining to complete version 2.0 of the specification.

S-102 Section	Section Name	Due Date	Status	Comments
12.0	Metadata	12/30/16	Ongoing	• Clean up section 12.0 to ensure compliance with S-100 version 3.0.0.
9.0	Portrayal	3/30/17	Ongoing	• (12/30/16) Develop draft portrayal options for submission to the S-102 project team. • (2/28/17) Hold telecom to discuss draft portrayal. • (3/2017) Hold breakout session to finalize portrayal at S-100WG2 (Genoa, Italy).
4.3	S-102 Feature Catalogue	3/30/17	Ongoing	• S-102 features to be registered during portrayal phase. • Features to finalized after S-100WG2 meeting.

Annex B	HDF	12/30/16	Ongoing	• Clean up HDF5 section.

2.13 Develop a Product Specification for Under Keel Clearance Management (UKCM) Information (D.7)

The UKCM PT (PT) was established in late 2015 and held its first meeting in September 2016 (Singapore) to scope out the primary requirements of an S-100 Product Specification (PS). 16 members of the PT attended the meeting, providing coverage from a mix commercial, government, academic and port related organisations.

The three day meeting (chaired by Australia and hosted by the Singapore Maritime and Port Authority) made a solid start on the work needed to commence drafting the PS. After several presentations and information sharing sessions, the PT determined the PS should focus on the primary outputs produced by shore based UKCM service providers. These outputs are:

- a time based layer indicating calculated go/no-go areas, and
- critical UKCM waypoints and their associated tidal windows.

The PT identified that 'discovery' information about the location and operation of UKCM services should be included in appropriate nautical publications and within relevant ENCs. This would enable information about UKCM services to be brought to mariner's attention when preparing berth to berth passage plans. The PT intend forwarding a request to the S-100 WG and / or NIPWG to amend the relevant documents/standards.

Over the next six months the PT will work by correspondence to prepare a draft PS for UKCM information.

The PT are planning to hold a second meeting in Italy on 13 and 14 March 2017. There are good synergies with the location and dates of the planned S-100 WG meeting in Italy in March 2017, and the dates also fall the week after the IMO's meeting of the Navigation Communications and Search and Rescue (NCSR) Sub-Committee (London). It is hoped that these synergies will assist PT members in being able to attend the meeting.

ACTION REQUIRED: The UKC PT requests that HSSC assign the UKC an official S-100 product specification number.

2.14 Develop S-121 Product Specification for Maritime Limits and boundaries (D.8)

This project team was stood up in 2016 and held its first meeting in October 2016 (New York, USA) to understand Member State specific implementation requirements that will help frame the content of the standard and to manage scope creep.

ACTION REQUIRED: Add Develop S-121 Product Specification for Maritime Limits and Boundaries to the S-100 Work Plan (new D.8)

2.15 Monitor the development of other related international standards (E.1)

Various members of the S-100 working group also participate in the development of other related international standards and regularly report back on relevant developments.

2.16 Monitor and coordinate interactions with OGC and IOGP, to ensure proper harmonization in the development of standards (E.2)

OGC has formally established a Marine Domain Working Group (MDWG). The purpose of this group is to facilitate discussion of the requirements that define different exchange methods and formats to ensure that data used for navigation can also be used within the broader realm of MSDI for non-navigational purposes. Specifically, the Marine DWG will pursue the following activities.

1. Discuss the content of a conceptual model for a MSDI.

2. Discuss the types of OGC services that might be useful in providing hydrographic and seafloor survey data e.g. chart features, high resolution bathymetric coverages through standardized interfaces.

3. Define any areas for standardization and create necessary Standards Working Groups to address the gaps in the OGC, IHO and IOGP standards baseline.

4. Explore the potential for an interoperability pilots and testbeds that help define the workflows for ensuring that marine geospatial data can be used for purposes other than navigation. This will include identifying potential sponsors.

5. Determine the Big Data potential for marine data and identify relevant standardized interfaces and experiment with testbeds.

There is overlap in membership between the S-100WG and this new OGC Marine DWG.

As to the International Oil and Gas Producers, the Chair of the S-100WG is not aware of any current activity.

2.17 Liaise with IHO subsidiary bodies and subordinate organs (F.1)

S-100WG continues to coordinate with other IHO working groups on building S-100 compliant product specifications and submits activity reports to various IHO working groups. As part of this liaison activity the IHB has set up a project management site called Basecamp. This allows for the creation of specific tasks and a repository for working documents that are too large to exchange via email.

2.18 Liaise with non-IHO constituents (F.2)

2.18.1 IALA

S-100 members continue to coordinate with IALA. Representatives from the IALA E-NAV working group regularly attend the S100WG and Focus Group meetings.

2.18.2 ISO

The IHB continues to send a representative to ISO meetings. The IHB then informs the S-100 working group of changes to ISO standards that may impact S-100.

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2.18.3 JCOMM

JCOMM continues to make progress on developing S-411 (Ice Information) and S-412 (Weather Information).

3 Progress on HSSC Action Items

AGENDA ITEM	SUBJECT	ACTION No.	ACTIONS (in bold, action by)	TARGET DATE/EVENT	STATUS (at 15 Dec 2015)
5. Reports by HSSC Working Groups					
5.1 S-100 (S-100WG)					
5.1	IMO Performance Standards	HSSC7/06	**S-100WG** to investigate and identify any amendments to existing IMO Performance Standards that may be required to use S-100 based products including S-101 ENCs.	**HSSC-8**	Completed – See Input Paper
5.1, 5.5	S-100 Domains	HSSC7/07	**NIPWG** to submit to the **S-100WG** a proposal relating to harmonization requirements within the different domains of the Feature Concept Dictionaries.	**February 2016**	Completed See S100WG01-10.6A
NOTE: S100WG has asked NIPWG to defer to at least 18 months until we can properly use the registry. However, it was agreed by both NIPWG and the S100WG to merge the two domains into a single IHO Hydro Domain to make management easier.					
5.1	Registry Manager	HSSC7/08	**HSSC Members** to ensure that their country support the IHO budget for 2016 proposing to staff the S-100 Registry Manager position through a permanent IHB staff member (IHO CL 74/2015 refers).	**30 November 2015**	Completed - Jeff Wootton reported on October 3.
5.1	Under Keel Clearance Management Information	HSSC7/09	**S-100WG** to set up a project team for developing a product specification for under keel clearance management information	**HSSC-8**	Completed
5.1	Under Keel Clearance Management Information	HSSC7/10	**IHB** to issue a CL inviting IHO MS and Expert Contributors to participate in the Under Keel Clearance Management Information Project Team (UKCM PT) created at HSSC-7, and provide support to the S-100WG accordingly.	**End of November 2015**	DONE IHO CL84/2015 dated 9 Dec
5.3 ENC Standards Maintenance (ENCWG)					

AGENDA ITEM	SUBJECT	ACTION No.	ACTIONS (in bold, action by)	TARGET DATE/EVENT	STATUS (at 15 Dec 2015)
5.1, 5.3	Portrayal of Lengths of Sector Lights	HSSC7/15	**S-101 Project Team** to consider the proposal submitted by the Norwegian Coastal Administration on the portrayal of lengths of sector lights (Doc. HSSC7-05.1C).	**HSSC-8**	Completed See S101PT01-3.4
5.6 Nautical Cartography (NCWG)					
5.1, 5.6	AIO	HSSC7/24	**S-101 PT** to address the need for improved functionality regarding T&P updates in future ENC/ECDIS.	**HSSC-8**	Completed
Note: The DCEG provides some guidance for utilizing the Update Information feature for this purpose.					
5.9 Hydrographic Dictionary (HDWG)					
5.1, 5.9	Future of S-32	HSSC7/28	**S-100WG** to provide the HDWG with its generic technical specifications / requirements in terms of definitions, register(s) and procedures.	**May 2016**	Complete
Note: Closed via email exchange with the chair of HDWG. It was decided that where it was relevant that the FCD would use the S-32 definitions, but would not replace S-32. The Registry Manager will have to harmonize the definitions between the two items.					
6. Inter-Organizational Bodies					
6.1 Advisory Board on the Law of the Sea (ABLOS)					
6.1	S-121 – Maritime Limits and Boundaries	HSSC7/30	Considering that the IHO S-121 Product Specification will not be approved before end of Dec. 2017, **IHB** to inform DOALOS (**in liaison with ABLOS Chair**) of the expected date of approval of S-121.	**End of Nov. 2015**	DONE IHB Letter dated 15 Dec 2015
6.1	S-121 – Maritime Limits and Boundaries	HSSC7/31	**IHB** to issue a CL inviting IHO Member States to support the development of S-121 product specification within a project team under the S-100WG.	**End of Nov. 2015**	DONE IHO CL84/2015 dated 9 Dec
7. Decisions of other bodies affecting HSSC					
7.1 IRCC (incl. MSDIWG)					
5.1, 7.1	S-102	HSSC7/33	**Chair of S-102 PT** to consider the issues of interoperability with SDI standards (such as INSPIRE elevation data specification, etc.).	**HSSC-8**	Complete

AGENDA ITEM	SUBJECT	ACTION No.	ACTIONS (in bold, action by)	TARGET DATE/EVENT	STATUS (at 15 Dec 2015)
NOTE: Inspire references the following in their documentation: *For the latter, (bathymetry) a file according to the BAG standard format of the International Hydrographic Organisation may be used optionally as an external file to provide the values.* It should be noted that the BAG format is standard that is maintained by the Open Navigation Surface Working Group. The IHO standard, S-102, makes use of the BAG format but reserves the right to be more restrictive due to the final product (SoN).					
7.2 IMO					
5.1, 5.5, 7.2	Harmonized display of navigation information	HSSC7/36	**S-100WG** to prepare, in liaison with **NIPWG**, the **IHB** and the **HSSC Chair**, a submission on the contribution of the S-100 framework to the harmonized display of navigation information and the impact on existing performance standards for consideration by NCSR 2 (deadline: 25 Dec 2015).	**18 Dec. 2015**	Completed
5.1, 5.3, 7.2	E-navigation implementation	HSSC7/37	**ENCWG and S-100WG** to monitor any possible impact of the work on the agreed e-navigation outputs on ECDIS related standards and S-100 related standards respectively.	**HSSC-8**	On-Going
5.1, 5.5, 7.2	Unique Identifiers	HSSC7/41	**NIPWG and S-100WG** to consider referring the issue of Unique Identifiers to the IMO-IHO Harmonization Group on Data Modelling and report to HSSC-8 (see Action HSSC7/42).	**HSSC-8**	Complete – S-100 has the capability for Unique Identifiers will utilize the IALA MRN concept
7.6 IALA					
5.1, 7.6	Unique Identifiers	HSSC7/42	**IALA** to submit its requirements on Maritime Resource Name scheme to the S-100WG (see Action HSSC7/41).	**Prior to S-100WG-1**	On-Going
7.13 DGIWG – NATO GMWG					

AGENDA ITEM	SUBJECT	ACTION No.	ACTIONS (in bold, action by)	TARGET DATE/EVENT	STATUS (at 15 Dec 2015)
5.1, 7.13	AMLs	HSSC7/45	**S-100 Registry Manager** to process the request for the establishment of a domain for Additional Military Layers (AML) in accordance with S-99.	**S-100WG-1**	Completed

4 Problems Encountered

The major issue is that the delay in the S-100 Registry (note that it is a complex task) has delayed some of the development of S-100 based product specifications – especially those that are ready to develop their feature and portrayal catalogues. In addition, the portrayal catalogue builder has not been used to develop S-100 based portrayal catalogues as the focus has been on updating the other pieces of S-100 infrastructure – Registry and FCB. Because of the lack of extensive testing and some changes to the S-100 Register infrastructure the PCB may need to have some additional upgrades and functionality added.

5 Recommendations

HSSC is invited to

- Approve the continued activity of the S-100WG work plan.

6 Justification and Impacts

Not applicable.

7 Action Required of HSSC

The HSSC is invited to

- note this report and approve the continuance of the Work Plan.

Proposed S-100 Working Group Proposed 2016-2017 Workplan

Tasks

A	Maintain and extend S-100 "IHO Universal Hydrographic Data Model" (IHO Task 2.2.2.2)
B	Maintain and extend S-99 "Operational Procedures for the Organization and Management of the S-100 Geospatial Information Registry" (IHO Task 2.2.2.9)
C	Maintain and extend the S-100 GI Registry (IHO Task 2.2.4)
D	[Supervise/Advise] and support the development and maintenance of S-100-based product specifications
E	Monitor the development of other related international standards
F	Provide outreach and technical assistance regarding the implementation of S-100 (IHO Task 2.2.5)
G	Maintain the S-100 section of the IHO website (IHO Task 2.2.2)
H	Conduct the 2016 and 2017 meetings of the S-100WG and its sub-group(s) and project team(s) (IHO Task 2.2.1)

Work Items

Work item	Title	Priority H-high M-medium L-low	Next milestone	Start Date	End Date	Status P-planned O-ongoing C-completed S-Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
A.1	Maintain and Extend S-100	H	HSSC 9~~8~~	2010	Permanent	O	Julia Powell (NOAA)		
A.2	Development of an S-100 Interoperability Specification	H	HSSC ~~8 &~~ 9	2015	2017	O	Julia Powell (NOAA)		

Work item	Title	Priority H-high M-medium L-low	Next milestone	Start Date	End Date	Status P-planned O-ongoing C-completed S-Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
B.1	Update S-99 and the S-100 Registry pages for the registration of S-100 product specifications in accordance with HSSC6-05B rev1	M	HSSC 98	2015	20176	P	Julia Powell (NOAA)		
C.1	Update and maintain S-100 GI Register to edition 32.0.0 and re-build the web-interfaces	H	HSSC 98	2015	2016Permanent	O	Yong Baek (KHOA)		
C.2	Connect the S-100 Feature Catalogue Builder to the S-100 GI Register	H	HSSC 98	2015	2016Permanent	O	Yong Baek (KHOA)		
C.3	Develop web-interfaces to propose new symbology to the S-100 Portrayal Register	H	HSSC 98	2015	2016Permanent	O	Julia Powell (NOAA)Yong Baek (KHOA)		
C.4	Update and Maintain the Portrayal Catalogue Builder	H	HSSC		Permanent	O	IHO Secretariat		
D.1	Review the S-100 Master Plan annually	M	HSSC-7 & 89	2014	Permanent	O	Julia Powell (NOAA)	S-100	Include monitoring the need to revise existing S-100-based PS (e.g. S-102) and or to develop new S-100-based PS.
D.2	Review the S-101 Value Added Roadmap annually	H	HSSC 9-7 & 8	2013	Permanent	O	Julia Powell (NOAA)	S-101	
D.3	Finalization of S-101 ENC Product Specification	H	HSSC 9	2015	2018?	O	Julia Powell (NOAA)		
D.4	Monitor the implementation of the 1st draft of S-101 ENC product specification	H		2015		P			

Work item	Title	Priority H-high M-medium L-low	Next milestone	Start Date	End Date	Status P-planned O-ongoing C-completed S-Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
D.5	Develop an S-100/S-101 Test Strategy and Test Bed	H	HSSC 9	2013	2018		Julia Powell (NOAA)		
D.6	Develop Edition 2.0.0 of S-102 Bathymetric Content Specification.	H	HSSC 98	2014	20187	P	~~Wade Ladner (NAVO)~~Dave Brazier (NAVO)		
E.1	Monitor the development of other related international standards	M			Permanent	OP	Julia Powell (NOAA)		
F.1	Liaise with IHO subsidiary bodies and subordinate organs, e.g. WWNWS-SC, NIPWG, ENCWG, etc.				Permanent	O	Julia Powell (NOAA)		Establish joint project teams as required
F.2	Liaise with non-IHO constituents, e.g. IALA E-nav Committee, IEHC, JCOMM Expert Teams, DGIWG, ISO, marine navigation and GIS industry, etc.	H		2004	Permanent	O	Julia Powell (NOAA)		
G.1	Maintain the S-100 section of the IHO website	H		2003	Permanent	O	Tony Pharoah (IHB)		