Paper for Consideration by HSSC10

Explanatory Note to the S100 Working Group Report

Submitted by:	S100 Working Group Chair
Executive Summary:	This paper provides a brief explanation behind the proposed path to publication for S-100 Edition 4.0.0 and other specifications that are tied to it.
Related Documents:	S-100 Working Group Report.
Related Projects:	S-100, S-101, S-102, S-111,S-121

Introduction / Background

This paper serves as an explanatory note to the proposed strategy outlined in the S100 working group report to HSSC in regards to the publication of S-100 edition 4.0.0 and other product specifications.

Analysis/Discussion

Prior to the establishment of the IHO Council, HSSC traditionally met annually in November. With the council now meeting in October of each year, HSSC has moved its meeting up by five months. Thisrequires the S-100 Working Group and TWCWG to provide HSSC its proposed path for publication for S-100 Edition 4.0.0 and various product specifications tied to it, a little earlier than originally anticipated. Whereas we had previously scheduled to provide the HSSC its progress report in November 2018 for January 2019 release, we are now proposing providing the status report in May 2018 for release in December 2018. The S100 team feels comfortable with this accelerated release schedule and seeks HSSC endorsement at this time.

S-100 Edition 4.0.0

S-100 Edition 4.0.0 is on track to publish in early 2019 (see HSSC-9). Key items have been included in edition 4.0.0 that warrant the S-100 working group moving its publication date to December 2018. These items include:

- Online Communication - inclusion of a set of components and processes needed to specify and online exchange of information, including streaming data. This extension came via IALA.
- Scripting Language – definition of a standard mechanism for scripting support in S-100 based products using the Lua language.
- Lua Portrayal Support – Implementation of the Lua scripting language in support of portrayal.
- Harmonization of the HDF5 encoding used by S-102 and S-111

Table 1 (see below) provides a proposed timeline for the publication of S-100 Edition 4.0.0
The path adheres to TR 2/2007; HSSC has accepted that S-100 is a framework and thus does not follow the traditional path of testing for specifications. Instead, it forms the basis for the S-100 test bed, which will be used by S-100 based product specifications to test.

Once S-100 Edition 4.0.0 is approved then items such as the S-100 GI register, Feature Catalogue Builder and Portrayal Catalogue Builder will be updated to the revised models contained within S-100 and undergo testing prior to public release. It is important to note work has already begun within the IHO to adopt many of the concepts that have been provisionally accepted into edition 4.0.0.

S-102 Edition 2.0.0 – High Resolution Bathymetric Data

S-102 Edition 2.0.0 is also in the process of being finalized by the S-102 project team under the S-100 Working Group. The project team has resolved many of the outstanding issues that spurred the creation of edition 2.0.0 and is in the process of wrapping up the final documentation to undergo a final stakeholder review for any editorial items. See table 1 for the proposed path forward for release of S-102 Edition 2.0.0. TWCWG is also proposing that S-111 follow this same path, as both S-102 and S-111 are dependent upon the publication of S-100 Edition 4.0.0.
TABLE 1

Date (CY 2018)	Proposed Timeline for Publication of S-100 edition 4.00 and S-102 Edition 2.0.0
Quarter 2	Consolidate approved proposals into a committee draft
Quarter 3	Comment period open for Member States and Stakeholders (only for those parts that have changed
Quarter 3	Resolve any outstanding issues at the Test Strategy Meeting
Quarter 3	HSSC Letter for Committee Approval
Quarter 4	IHO Circular Letter for Member States Approval
Quarter 4	S-100 Edition 4.0.0 is published (December 2018) S-102 Edition 2.0.0 is published (December 2018)

Per TR 2/2007, an impact study was conducted in 2016 that supported the need to update S-102. In addition, the US Navy (NAVOCEANO) has produced a Bathymetric Attributed Grid (BAG) to S-102 convertor to enable the production of test data for use in the S-100 test bed. This test data has enabled S-102 to provide useful information regarding the portrayal of S-102 data within a navigation system and the convertor will be available to interested parties in late summer 2018.

S-101 Edition 1.0.0 – The Electronic Navigation Chart Specification

According to the S-101 Value Added Roadmap endorsed by HSSC5 in 2013 ,Edition 1.0.0 *was to have been* published in 2016. However, due to infrastructure issues with S-100, some of the key components of S-101 were not available in 2016.   With the Republic of Korea's generous support to develop and maintain the S-100 Registry, S-100 Feature Catalogue Builder and now the S-100 Portrayal Catalogue Builder, the S-100 infrastructure has now been stabilized to allow production of edition 1.0.0 of S-101.

S-100 working group is proposing to HSSC and to the wider IHO community that a modular approach be taken in its progression to a specification that is implemented by the member states. This approach is the same that is used in software development where the 1st edition of the specification is not the stabilized edition, but the edition that will allow for system implementer's to "kick the tires" and provide continual feedback on what is working and what is not working, a "beta" version. These items also may trigger a change to S-100 as the overarching framework standard. The following table outlines the proposed progression of S-101 that leads to an operational standard:

S-101

Components	Edition 1.0.0 (2018)	Edition 2.0.0 (2020)	Edition 3.0.0 (2022)
Main Documentation	✓	✓	✓
Feature Catalogue	✓	✓	✓
Portrayal Catalogue	Partial	✓	✓
Validation	Partial	✓	✓
Data Classification and Encoding Guide	✓	✓	✓
Encoding Format	✓	✓	✓
Encryption		✓	✓
Alerts and Indications		✓	✓
Full Test Data Sets for Type approval		Partial	✓
Notes	Portrayal will be limited to S-52 rules translated to LUA	Edition 2.0.0 refines all the additional rules	Operational Edition

The development of S-101 has followed the tenants prescribed in TR/2007 as it has undergone numerous cycles of testing and review. The S100 Working Group has developed (under NOAA and ESRI sponsorship) an S-57 to S-101 convertor that provides a wide variety of test data. Two active test beds have implemented draft versions of S-101 that have helped provide feedback. The only thing that held back the publication of S-101 was the need to stabilize the S-100 infrastructure. In addition, at HSSC9 the above path forward with S-101 was presented to the committee. This same path forward was introduced to the S-100 Working Group and the only recommended change was that instead of one year between planned editions of S-101 that there be two years.

Therefore, the S-100 Working Group proposes the following path to publication for S-101 Edition 1.0.0:

Date (CY 2018)	Activity
Quarter 2	Send out S-101 for final stakeholder review
Quarter 3	Resolve any outstanding issues at the S-101 Project Team Meeting
Quarter 3	HSSC Letter for Committee Approval
Quarter 4	IHO Circular Letter for Member States Approval
Quarter 4	S-101 Edition 1.0.0 is published – Target December 2018

Conclusions
As the S-100 framework and infrastructure continue to stabilize more and more, additional products will be developed against it. 2018 could be potentially a big year for S-100 since potentially the following specifications may also be approved by HSSC and adopted by the IHO member states:

Specification's baselined to S-100 Edition 3.0.0:	Specification's baselined to S-100 Edition 4.0.0
• S-122 – Marine Protected Areas • S-123 – Radio Services	• S-101 – Electronic Navigational Chart • S-102 – High Resolution Bathymetry (2.0.0) • S-111 – Surface Currents • S-121 – Maritime Limits and Boundaries

Overall, S-100 and its product specifications represent the future of the IHO. The use of S-100 has extended beyond IHO to include IALA, IEC, WMO and IEHG.   The publication of S-101 was delayed for years due to other issues, but the concepts that have been included in S-101 have been baselined for the past two years. The publication of IHO S-101 Edition 1.0.0 will provide for implementation to begin by system manufacturers. This will provide critical feedback to the IHO Member States so that S-101 realizes the IHO's call for it to be the modern successor to S-57.

Action Required of HSSC
The HSSC is invited to:
      a.   note the explanatory text to the S100 Working Group report.