INTERNATIONAL MARITIME ORGANIZATION

INTERNATIONAL HYDROGRAPHIC ORGANIZATION

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IMO/IHO HARMONIZATION GROUP ON DATA MODELLING
Agenda item 3

HGDM 2/3
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CONSIDERATION OF REPORTS ON DEVELOPMENTS EMANATING FROM IHO MEETINGS

Update on IHO S-100 standards development activities

Submitted by IHO

SUMMARY	
Executive summary:	The IHO S-100 Standard[1] is the underlying framework which is being used to develop products and services for e-navigation. This document provides a brief summary of the status of the S-100 Standard, and relevant product specifications under development
Action to be taken:	Paragraph 9
Related documents:	None

Introduction

1 The IHO published edition 3.0.0 of the S-100 Standard (S-100) in April 2017, and in response to requests for extensions to the standard, it has produced a new edition 4.0.0 which will be released in January 2019. S-100 edition 4.0.0 includes the following extensions:

.1 addition of a new framework for online data exchange (new part 14);

.2 inclusion of a metadata model for services – based on the new ISO metadata model (extension to part 4a);

.3 addition of a new section for data protection and authentication (new part 15);

.4 extension to the discovery metadata classes to accommodate digital signatures, data protection, and authentication;

.5 portrayal model has been extended to include a new coding language to present encoded information visually (LUA scripting language);

[1] The IHO S-100 "Universal Hydrographic Data Model" standard is based on the ISO 19100 Standard Series of the International Organization for Standardization (ISO) for Geographic information/Geomatics.

.6 spatial schema has been extended to include a new spline curve geometry spatial type; (extension to part 7);

.7 GML and ISO 8211 data encoding formats have been extended to cater for the new spline spatial types;

.8 HDF5 coverage format has been extended to provide a common structure to cater for all product specifications using the HDF5 encoding format; and

.9 Guidance on the use of Maritime Resource Names (MRN).

2 The S-100 Working Group has also developed guidance documents for other communities that are developing product specifications based on the S-100 Standard framework.

S-100 Revision Cycle

3 A key feature of S-100 Standard is that it is maintained independently from the product specifications that are built from it. The S-100 Standard framework utilizes versioning for both the S-100 base standard and the derived product specifications. This means a product specification is built from an edition of S-100 and is not affected as the S-100 standard itself evolves. Only when a product specification needs revision, will consideration be given to aligning it with the latest edition of S-100. Figure 1 below provides an overview of the status of the suite of Product Specifications relevant to a future S-100 based ECDIS.

4 In order to accommodate requests for extensions / changes to the S-100 Standard, new editions will be produced as part of a regular maintenance cycle.

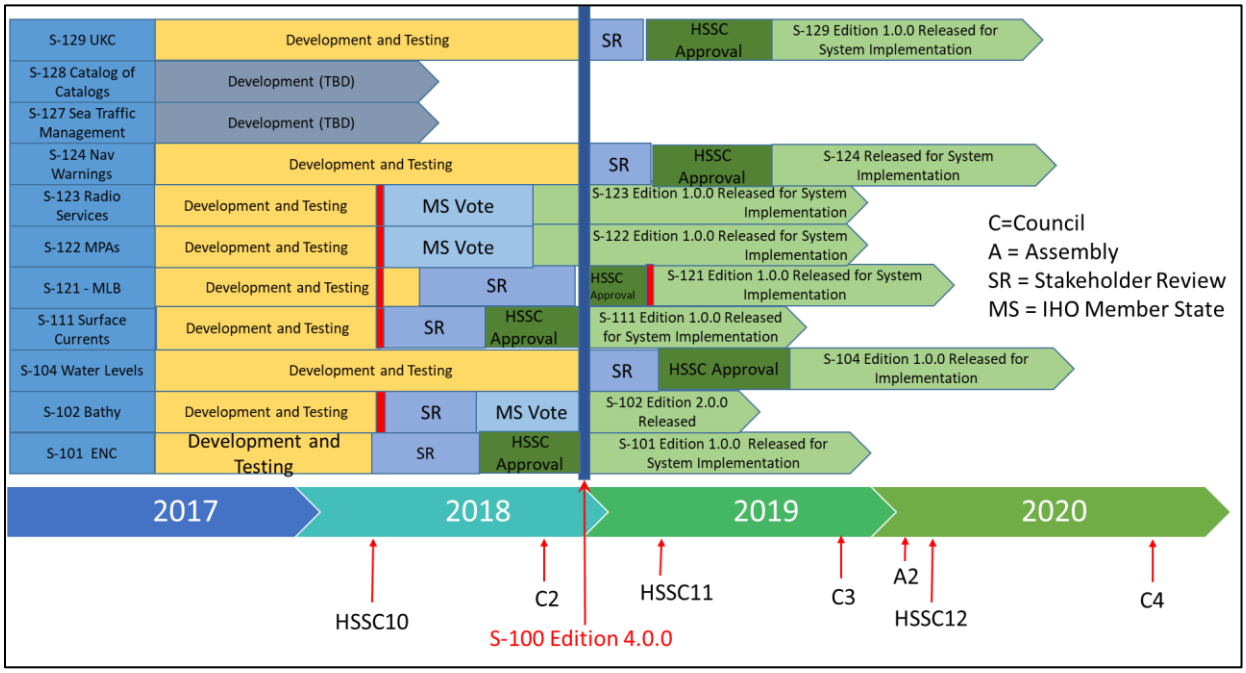

Figure 1: Overview of the status of the suite of Product Specifications relevant to a future S-100 based ECDIS

The IHO GII Registry

5 The IHO GII Registry, which is basic operative element of the S-100 Standard framework, has been operational for a few years and currently holds several thousand items that have been registered by several participating organization domains. In response to their requirements to extend the scope and functions of the current version of the IHO GII Registry, the Korean Hydrographic and Oceanographic Organization (KHOA) is developing a new version of the Registry application. The new version will include new registers (databases) for information about Product Specifications, Producer Codes and Test Bed projects. The new IHO GII Registry version separates the content in the current FCD Register into a Concept Register and a Data Dictionary Register. It is expected that the new IHO GII Registry version will be operational during the first quarter of 2019.

Tools and test beds

6 In order to design, test and evaluate S-100 conformant Product Specifications for operational use, a number of software tools and test datasets have been produced. These resources, which have primarily been developed to support testing include:

.1 S-100 data viewers (versions by KHOA, SPAWAR, SevenCs);

.2 S-101 Feature catalogue builder (KHOA);

.3 S-101 Portrayal catalogue builder (KHOA);

.4 S-57 ENC to S-101 ENC data converter application (ESRI /NOAA);

.5 S-100 Data Capture and Encoding Guide (DCEG) builder (KHOA); and

.6 S-101 Validation rule database (KMS – Denmark).

Many of these applications are currently freely available for testing. Others will be made available when they are more mature.

7 The production of S-100 based datasets to carry specific information such as detailed bathymetry and charting features has been ongoing for test purposes. Several test bed projects have been conducted or are about to be conducted to test the use and interoperability of these datasets in a single end users device. Systematic investigations for interoperability are currently being undertaken for the following S-100 based datasets:

.1 S-101 ENC Electronic Navigational Chart (ENC);

.2 S-102 Bathymetric Surface;

.3 S-104 Water Level Information for Surface Navigation;

.4 S-111 Surface Currents;

.5 S-122 Marine Protected Areas;

.6 S-124 Navigational Warnings; and

.7 S-412 Weather Overlay.

These ongoing tests are helping to resolve products interoperability issues and are contributing to the compilation a special IHO Publication "*Specification for Data Product Interoperability in S-100 Navigation Systems*" (S-98).

IHO Work Programme key priorities for 2019-2020

8 The IHO S-100 Standard framework is a living technical infrastructure subject to ongoing maintenance, adaptation and enhancement. Key priorities identified by the IHO Hydrographic Services and Standards Committee as the responsible IHO body for the further improvement of the S-100 Standard framework include:

.1 the development of "S-98 - Specification for Data Product Interoperability in S-100 Navigation Systems";

.2 the development of S-121 Product Specification for Maritime Limits and Boundaries;

.3 the consolidation of Product Specifications definition timeline in accordance with the new simplified S-100 Master Plan, with particular attention to S-101;

.4 the consolidation and clarification of standards in relation to ECDIS/ENC;

.5 the consideration of data quality aspects in an appropriate and harmonized way for all S-100 based product spec and the development of a Minimum Standard for Data Validation; and

.6 the contribution to the development of an initial guidance on definition and harmonization of Maritime Services as relevant element of IMO's e-navigation framework.

These priorities are synchronized with interregional coordination activities of the IHO and address the timeline of the affected bodies, namely IMO-HGDM and UN-GGIM.

Action requested of the HGDM

9 The HGDM is invited to:

.1 take note of the information provided in this report;

.2 consider the current status of S-100 based product specifications currently under development for testing purposes; and

.3 take any other action considered appropriate.