Proposal for Consideration by the Council

Development and future provision of S-100 based Products

Submitted by: HSSC Chair – IRCC Chair and IHO Secretary-General

Executive Summary: Several product specifications for S-100-based hydrographic products have now reached a level of maturity that deserve discussions on the practical aspects of their production and dissemination of the datasets, and the resultant specific actions to be put to HSSC and IRRC. As a parallel activity, internal discussion on how and when IMO must be approached to acknowledge the legal status of these new products as being equivalent with existing digital nautical charts and publications and therefore to be approved as fulfilling the applicable carriage requirements (SOLAS Chapter V, Regulations 2, 9.2.2 and 19.2.1.4 refer).

Related Documents: S-100 Master Plan, HSSC and IRCC Reports to C-2

Introduction

1. Several product specifications for S-100-based hydrographic datasets under HSSC responsibility are approaching their first releases in the near future (2018-19), as per the new simplified S-100 Master Plan to be reviewed annually (see Figure 1 of this document). Having such new standardized digital nautical products and associated data sets at hand already now and more in the near future, the question arises when, whether and to what extent these products should be considered by the national Hydrographic Offices as part of their regular data production and dissemination for their respective areas of responsibility.

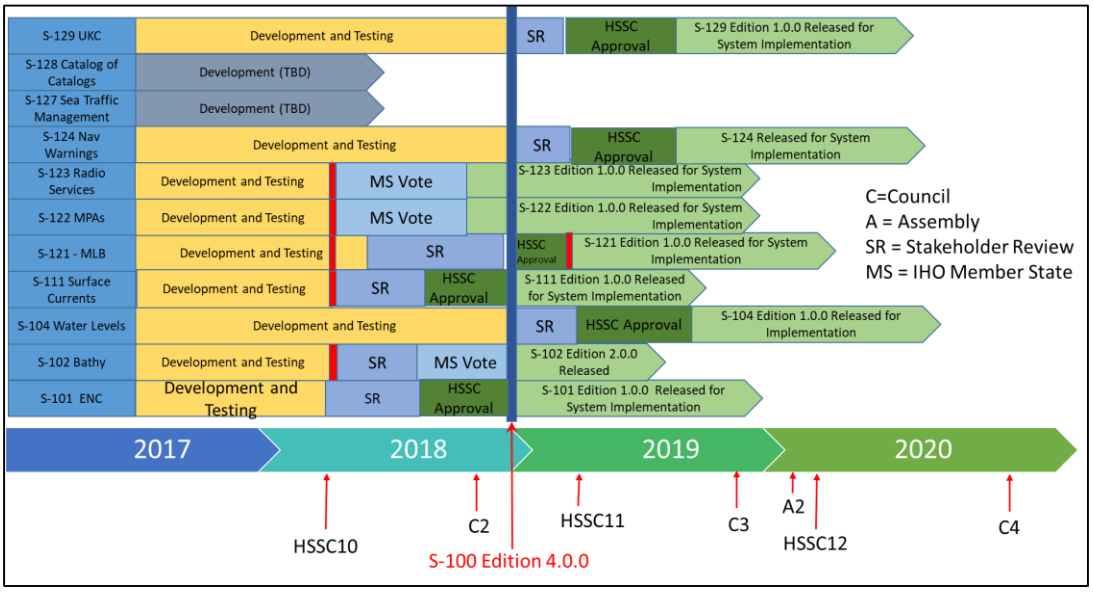

Figure 1: Simplified S-100 Master Plan

2. As a follow up to a general positive response on these questions, there are a number of other considerations, namely the legal status of the new data products, the availability of production systems, the availability of data to build the products for an adequate[1] world-wide coverage, the availability of skilled and trained people in the national Hydrographic Offices to build these products and qualify them, the provisions for their world-wide dissemination and their transfer to and use in ECDIS and/or supplementing back bridge systems. For the definition of the future chain from production of such datasets up to the presentation to the end user, HSSC tasked the Nautical Information Publication Working Group (NIPWG) to initiate a survey to provide some clarity through investigation of measures to be taken.

3. Due to the principal importance of this matter for the further work under the Work Programme 2 (HSSC) and Work Programme 3 (IRCC), HSSC-Chair/IRCC-Chair/IHO Secretary-General jointly intend to initiate a Council debate on the development, further use and distribution of S-100 based products, complementing the content of the next generation S-101 ENC. The clarity on the way towards IMO´s formal recognition of S-101 ENCs as an authoritative format for ECDIS chart content will be an indispensable precondition for this debate.

Discussion

4. The replacement of printed nautical publications by a database which is able to reproduce the chart content and thus, the fulfilment of the carriage requirement, is fully supported by SOLAS Chapter V, Reg 9 addressing ECDIS and applying IHO Standards as the appropriate means. The general policy of IMO to designate S-100 as foundation for its e-navigation implementation plan, suggests IMO´s acceptance of the S-100 framework and the derived product specifications as meeting the needs of modern technical data infrastructure at sea. Noting this, however, does not mean that S-100 based data products automatically replace S-57 ENCs and text oriented nautical publications in its current shape. Reality is that S-57 ENC and S-101 ENC will coexist for a long duration and this will apply to supplementing nautical publications in traditional formats as well. However, an unambiguous status within the IMO carriage requirements framework has to be granted to S-101 ENC in the first instance before supplementing S-100 based data products can be addressed under this regime too. The most relevant argument towards IMO for a formal recognition should be that S-101 ENC is equivalent to S-57 ENC in fulfilling the ECDIS carriage requirements for up to date nautical chart information. It should be demonstrated clearly to IMO that S-101 does not necessarily carry more detailed or more qualified chart content, but enables the seamless integration of nautical information delivered in new additional S-100 compliant navigational data products and allows interoperability to additional S-100 based data products from other domains such as meteorology to facilitate IMO´s e-nav concept of embedded marine services.

5. One of the main benefits of S-101 ENC technology is to simplify future software updates for ECDIS since such updates become part of the regular S-100 based data product delivery. Beyond this obvious progression, S-101 ENC and supplementing S-100 based data products enhance the protection of nautical data provision against potential cyber security threats. This argument has to be brought forward to the IMO for consideration on how this

[1] At least equivalent to existing nautical publications.

equivalence of S-101 with S-57 can be reflected through adaptation of the particular SOLAS Chapter V instruments.

6. As part of the general deliberations before the IMO is approached, the IHO should approve which S-100 based product specification or set of product specifications replaces or comply with current chart or text oriented nautical publications which are under IMO carriage requirement. Some analysis has already been carried out by the NIPWG and should be pursued. Though the overall ambition of full replacement/compliance by means S-100 based data products cannot be met at this stage, the available products based on S-100 product specifications could already be used in ECDIS, especially in route planning mode and enable substitution of printed and pdf material in parts and in specific geographic areas.

Proposals

7. Beyond the questions on their respective legal status, any principal decision of one or more national Hydrographic Offices in favour of a regular production and dissemination of S-100 compliant navigational data products should address the following subjects:

- Availability of data production tools;
  According to the self-declaration of industry, production software on known platforms stand ready to produce S-101 ENCs in parallel to a continued S-57 ENC production. Other S-100 navigational data products such as S-102, S-122 and S-123 should gain sufficient production software support as well, but are dependent on a thorough review and database oriented structuring of the content information by the Hydrographic Office for his respective area of responsibility. It is proposed to address this problem as main topic for a dedicated workshop on S-100 based data production with a strong participation of industry.

- Capacity building at national and regional level:
  Additional training is required if new features of S-101 ENCs (compared to S-57 ENCs) shall become subject to regular production. Best practice transfer is required for the extraction of the relevant text oriented information from traditional distribution media for the production of S-100 based navigational data sets - for example S-102, S-122 and S-123. It is proposed that WENDWG is tasked through IRCC to identify Hydrographic Offices which have already acquired ample knowledge in this field through their best practice experiences, and request them to provide specific training at national and regional level accordingly. It is also suggested that the WENDWG considers the applicability of the WEND Principles (coordinated and harmonized production and dissemination of S-57 ENCs), as they stand now, are applicable to S-101 ENCs, and possibly to the first available S-100 based products.

- Distribution concepts;
  It can be anticipated though that the IHO WEND concept should be easily applied to S-101 ENC distribution. The current system of S-57 ENC chart delivery is widely accepted and works very well (HO => RENC => VAR => Distributor => Vessel). This concept, including the RENC structure and qualified resellers, could potentially be applied to the supplementing S-100 compliant data products as well. However, alternative distribution concepts via national and supranational MSDI and associated geospatial portals, including IMO´s proposed provisions of marine services via the Maritime Connectivity Platforms, are viable options. It is proposed that the RENC hosting nations are encouraged to work on S-101 ENCs data validation, S-100 based products validation and qualification, encryption

and distribution concepts based on their respective experiences and present their findings to C-3.

- Application tests for different S-100 compliant ECDIS makers;
  Experiences gained from the introductory phase of ECDIS tell that there have been diverging interpretations of the applying IHO standards. As a result, the treatment of incoming data differed between different ECDIS manufacturers in view of data content interpretation and display. In order to avoid this, exhaustive testing is required. It is proposed to instruct HSSC to task its appropriate subordinated WGs to develop a full suite of representative test data for the range of interoperable S-100 based data products and to define viable test scenarios in strong collaboration with IEC/TC80.

Impact

8. Considering that HSSC and IRCC Work Programmes are the two main IHO pillars, the Committees and the IHO Secretary-General request the Council to formulate recommendations and to consider a way forward for addressing strategic discussions on the ways and means for an efficient implementation of S-100 based products, including their production and distribution, to be brought to the 2nd Session of the Assembly for further consideration.

Action required of the Council

9. The Council is invited to:
   a. discuss and agree on a roadmap for the regular production and dissemination of S-100 based hydrographic products;
   b. instruct HSSC Chair and IRCC Chair to put resulting action on the affected subordinate Working Groups and Project Teams;
   c. instruct the Secretary-General to inform IMO about the recent developments within the S-100 framework with particular emphasis on the uptake of S-101 and S-100 based data products to provide additional nautical information; and
   d. take any other actions that may be appropriate.