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ANY OTHER BUSINESS

Report on monitoring of ECDIS issues by IHO

Submitted by IHO

SUMMARY

Executive summary:	This document reports on the status of IHO's ECDIS-related standards and presents a road map for the introduction of the S-100 Universal Hydrographic Data Model and the next generation of S-101 Electronic Navigational Charts (ENC). It is part of the continuing monitoring by IHO of ECDIS issues related to the implementation of the carriage requirements in SOLAS regulations V/19.2.10 and 19.2.11.
Strategic direction, if applicable:	2
Output:	Not applicable
Action to be taken:	Paragraph 14
Related documents:	Resolutions A.817(19) and MSC.530(106); MSC.1/Circ.1593, MSC.1/Circ.1595, MSC.1/Circ.1503/Rev.2 and MSC 106/19

Background

1 In accordance with the directive agreed by the eighteenth International Hydrographic Conference (23 to 27 April 2012), the International Hydrographic Organization (IHO) continues to monitor the implementation of relevant IHO standards in ECDIS to ensure that issues identified with regard to the operation of ECDIS are collated, analysed, communicated and resolved as speedily as possible.

Introduction

2 The use of ECDIS with official Electronic Navigational Chart (ENC) data sets contributes to the enhancement of the safety of navigation. In conjunction with the mandatory carriage requirements for ECDIS, all IHO Member States have undertaken the necessary measures to meet their obligations to provide official ENC in the mandated data transfer standard, namely IHO S-57.

3 For the purpose of the cartographic functionality of ECDIS and the proper provision of data services, IHO maintains a suite of ECDIS-related standards, as referenced in appendix 1 of the IMO ECDIS Performance Standards (resolution MSC.530(106)).

4 IHO's current most relevant ECDIS-related standard is the transfer standard for digital hydrographic data S-57. This standard has been used for official ENCs since November 2000 and has not been technically updated since then. This period of consolidation has facilitated a stable technical environment for data production and dissemination services to reliably feed ECDIS installations delivered by a variety of Original Equipment Manufacturers (OEM) in compliance with the applicable IMO regulations on ECDIS. However, in the context of e-navigation and digitalization, there is a need for an upgraded technology.

5 In support of digitization on board, the exchange of nautical information and the provision of maritime services in the context of e-navigation, IHO's S-100 Universal Hydrographic Data Model was adopted by IMO in 2011 as the basis for technical harmonization of data services providing navigation related information exchange. S-100 is a contemporary, more versatile framework standard – it incorporates the requirements of S- 57 and is aligned with the ISO 19100 series of geographic information standards.

6 The Maritime Safety Committee, at its 106th session, approved MSC.1/Circ.1503/Rev.2 on *ECDIS – Guidance for good practice*. It also adopted resolution MSC 530(106) on *Performance Standards for electronic chart display and information systems (ECDIS)*. In doing so, the Committee invited IHO to keep IMO informed on the process development of the IHO S-100 framework standard.

Status of IHO ECDIS-related standards

7 In accordance with MSC.1/Circ.1503/Rev.2 – *ECDIS – Guidance for good practice* – the up-to-date list of all the relevant IHO standards and publications relating to ECDIS can be accessed from the IHO website (https://iho.int/en/standards-in-force). The ECDIS-related information on the IHO website was updated in December 2020 as shown in table 1.

Table 1: Status of IHO ECDIS-related standards

Designation	Normative reference for the type approval of ECDIS systems referring to the fourth edition of IEC 61174 (2015)
S-57 - *Transfer Standard for Digital Hydrographic Data*	Edition 3.1 (November 2000), in conjunction with: - Supplement 3 (June 2014) - S-57 Maintenance Document No. 8 (March 2002)
S-52 - *Chart Content and Display Aspects of ECDIS*	Edition 6.1(.1) (October 2014 - with clarifications up to June 2015)
S-52, Annex A - *IHO Presentation Library for ECDIS*	Edition 4.0(.3) (October 2014 - with clarifications up to December 2020)
S-64 - *IHO Test Data Sets for ECDIS*	Edition 3.0.3 (December 2020)
S-61 - *Product Specification for Raster Navigational Chart*	Edition 1.0 (January 1999)
S-63 - *IHO Data Protection scheme*	Edition 1.2(.1) (March 2020)

S-100 Implementation road map

8 The second session of the IHO Assembly, 16 to18 November 2020, endorsed the IHO S-100 Implementation road map for a transition plan aiming for the regular and harmonized production and dissemination of S-100 based products. The S-100 Implementation road map is planned to be reviewed annually by the IHO Council to guarantee the smooth integration in end user devices such as ECDIS and are composed of two steps covered by the S-98 interoperability specification for ECDIS as shown in table 2:

Table 2: Status of S-100-related standards

Product	Title
Critical framework	
S-98	Data Product Interoperability in S-100 Navigational Systems (Edition 1.0.0, May 2022)
S-100	Universal Hydrographic Data Model (Edition 5.0.0, December 2022)
S-128	Catalogue of Nautical Products (Edition 1.0.0, May 2022)
S-164	Test Data Set for S-100 and ECDIS Type Approval (Developing)
First step – Route monitoring mode	
S-101	ENC (Edition 1.0.0, December 2018) Annex A DCEG (Edition 1.0.2, March 2022)
S-102	Bathymetric Surface Product Specification (Edition 2.1.0, October 2022)
S-104	Water Level Information for Surface Navigation Product Specification (Edition 1.0.0, August 2021)
S-111	Surface Currents Product Specification (Edition 1.0.0, December 2018)
S-124	Navigational Warnings (Developing)
S-129	Under Keel Clearance Management (Edition 1.0.0, June 2019)
Second step – Route planning mode	
S-122	Marine Protected Areas (Edition 1.0.0, January 2019)
S-123	Marine Radio Services (Edition 1.0.0, January 2019)
S-125	Marine Aids to Navigational (AtoN)
S-126	Marine Physical Environment (Developing)
S-127	Marine Traffic Management (Edition 1.0.0, December 2018)
S-131	Marine Harbour Infrastructure (Developing)

Note 1: The first step is product specifications for Route monitoring which must be supported by the Critical S-100 Framework. Product specifications for Route planning will be developed as the second step.

Note 2: Edition 1.x.x of S-100 based product specifications are released for implementation and testing only. Operational versions will have edition 2.x.x (or higher). In the case of S-102 the operational version will be 3.x.x (or higher).

Implementation decade (2020 to2030) for IHO S-101 ENCs as a transfer standard for official charts in ECDIS

9 The IHO S-101 ENC product specification will be technically ready and exhaustively tested for regular production of S-101 ENCs by the end of 2024 as shown in figure 1. It is expected that from 2025 S-101 ENCs will be produced through export from commercially-developed, upgraded, database-driven ENC production systems.

10 The IHO Council, at its sixth meeting in November 2022, endorsed the revised Road map for the S-100 implementation decade (2020-2030) which includes collaboration with IMO and other liaising organizations as annex 1, updated S-100 timelines as annex 2 and WEND--100 Principles as annex 3 (https://iho.int/en/s-100-implementation-strategy).

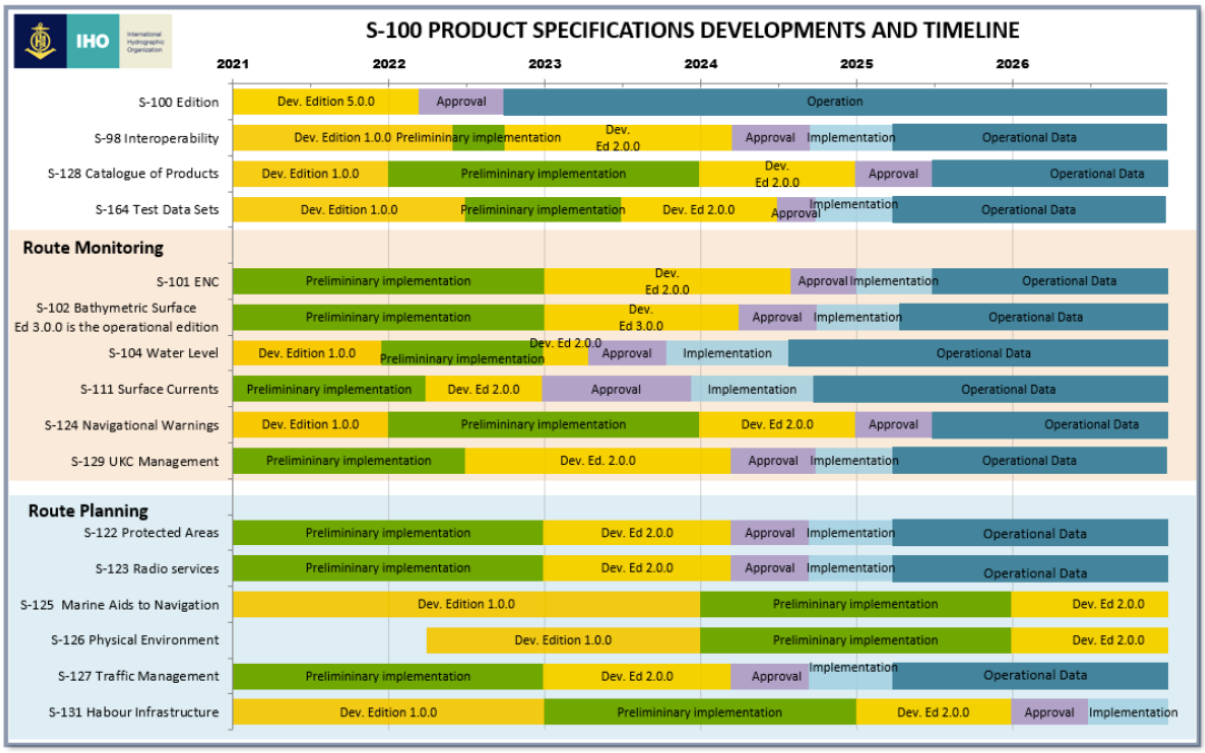

Figure 1: S-100 product specification development and timeline (updated: 12 July 2022)

11 IHO has collaborated closely with industry in the development of data production and encryption software ready to support safe and continuous production and dissemination of S-101 ENCs. IHO Member States have started work on a harmonized approach to enable ENC producing hydrographic offices to provide S-101 ENCs for their respective areas of responsibility, in parallel to the established production of S-57 ENCs. S-101 ENC distribution will happen via the established dissemination network in partnership with commercial chart suppliers. IHO has developed a governance document in support of the Dual Fuel Concept for S-100 ECDIS using S-101 ENCs in parallel to S-57 ENCs.

12 In November 2022, IMO approved the revised ECDIS Performance standards (MSC.530(106)), where S-100 is included (MSC 106/19). IHO Member States respect resolution on *Performance Standards for electronic chart display and information systems (ECDIS)* and the in-force dates agreed upon, with an understanding that adequate S-101 ENC coverage and appropriate complementary S-100 data/products services are expected when S-100 ECDIS becomes operational.

13 The S-100 framework and the related product specifications are not developed and maintained in isolation. Numerous international organizations collaborate actively with the technical bodies of IHO to develop and apply S-100 based products to their respective regulations and services. For the implementation of the first step, Route monitoring mode, cooperation with IEC is specifically important. The revision of the IEC 61174 ECDIS Test Standard is critical and must be synchronized with the development of the relevant IHO S- 100 products. IHO is in close contact with IEC and will secure that the IHO standards are developed, and if needed, speed up the process, to support the necessary revision of the mentioned IEC standard.

Action requested of the Sub-Committee

14 The Sub-Committee is requested to:

.1 note the maintained status of IHO's ECDIS-related standards;

.2 note the IHO S-100 Implementation road map and timelines of the development of product specification; and

.3 take any other action it considers appropriate.