

The S-100 – Universal Hydrographic Data Model: a Revolutionary Approach to Nautical Cartography and Maritime Services

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SUMMARY

The first digital standardization project of the International Hydrographic Organization (IHO) was the transformation of nautical chart information from an analogue paper chart explicating coastline, depths, and navigational aids and hazards, to a digital carrier Electronic Navigational Chart (ENC) in 1990s. The ENC has become one of the key information systems in maritime community for the safety of navigation at sea since International Maritime Organization (IMO) adopted the ENC carriage requirement onboard in 2012. The technical design of ENC is defined by IHO standards S-57 (IHO Transfer Standard for Digital Hydrographic Data) and S-52 (Specifications for Chart Content and Display Aspects of Electronic Chart Display and Information System - ECDIS). The current maintenance of existing standards and the development of new ones are driven by the need to continue to satisfy the SOLAS (International Convention of the Life at Sea) requirements of enhancing safety of navigation, and more recently, supporting the implementation of “e-navigation”, which is being led by the IMO. In addition, with the development of IT technology, various maritime services, such as fishing guidance, are being developed using marine geospatial information in modern devices such as mobile phones. The S-57/S-52 technology is now well established. Over 30.000 vessels do navigate with ECDIS around the globe. However, modern information technology has progressed since their inception and new technical options require their evolution.

The S-100 development concept reflects this need. It started in 2005 with the first aim to allow the interoperability with a wide range of marine geo-data, and secondly to overcome deficiencies for future digital nautical chart data products. S-100 has therefore become the most important application of the ISO19100 series of Geographic Information Standards, easier use of hydrographic data beyond Hydrographic Offices and ECDIS users (coastal zone mapping, security, inundation modeling, etc.), and to plug-and-play updating of data, symbology and software

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enhancements. By adopting the S-100 Universal Hydrographic Data Model, the IHO started to develop a versatile standard framework composed by S-100 based Product Specification (PS) so as to describe specific aspects of the real world. The advantage of such datasets, based on the same paradigm, is their mutual compatibility and interoperability. The latter supports a multitude of possible combinations of the geo-information encoded in datasets – independent from which science domain they belong to.

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