

# IHO S-100

IHO Publication 57 (IHO S-57) is the official IHO Transfer Standard for Digital Hydrographic Data, formally adopted in 1992. S-57 was intended to support all types of hydrographic data, the associated technology and different user groups, but adoption has been relatively limited. S-57 has been used almost exclusively for encoding electronic navigational charts (ENCs) for use in electronic chart display and information systems (ECDIS). One of the reasons for this is that S-57 is not a contemporary standard that is widely accepted in the GIS domain.

To address this, the IHO has embarked on the development of a new, more versatile standard – S-100, which will incorporate the requirements of S-57 for ENCs and ECDIS, but will be aligned with the ISO 19100 series of geographic information standards. S-100 should therefore form an attractive basis upon which a wider range of digital products and transfer standards for hydrographic and related applications will be developed in the future.

## Goals for S-100

S-100 will support items such as imagery and gridded data, 3D and time-varying data (x, y, z, and time), and new applications that go beyond the scope of traditional hydrography; for example, high-density bathymetry, sea floor classification and marine GIS. It will also enable the use of web-based services for acquiring, processing, analysing, accessing and presenting data. It is important to recognise that S-100 is not an incremental revision of the current Edition 3.1 of S-57. S-100 will be a new standard that includes additional content and support of new data exchange formats.

S-100 was released as a draft version in February 2008 and is in its development phase.

## Goal/Objectives for S-100

S-100 will become the new base standard for hydrographic data from which the widest variety of applications and uses can be defined.

## IHO Geospatial Information Registry

S-100 will be compiled and managed as an ISO-conforming registry on the IHO website and will be a part of the ISO 19100 series of geographic information standards. Currently, there are over 40 standards in the ISO 19100 series. These already include both adopted and draft International Standards for spatial and temporal schema, metadata, imagery and gridded data, profiles, portrayal and encoding.

A Registry contains a number of discrete Registers, each owned and managed by the relevant competent authority. At the heart of the IHO Geospatial Information Registry will be the following component Registries, each of which will contain various Registers.

These Registries will accommodate both core hydrographic content and other chart-related content, such as nautical publications, inland ENCs and marine information overlays. The IHO Geospatial Information Registry will also contain a Product Specifications Register. The structure of the IHO Registry is illustrated in Figure 3.

The component Registries and the Product Specifications Register will operate through a web-enabled registry interface and associated database that houses each Register. This is already established and is currently located at web reference 1.

## Register Owners

The IHO will own the Geospatial Information Registry and its four component Registries; however, the Register's subordinate Registers will be owned and therefore controlled by the relevant competent authorities, according to the nature and content of each Register.

## IHO Owners

Registers owned by the IHO will be confined to those that directly support those objects and attributes (to be known as 'Features' and 'Feature Attributes' under S-100) that are required to support the official hydrographic products and services required to meet the chart and publications carriage requirements of the Convention on the Safety of Life at Sea (SOLAS). The numbering convention for the IHO standards relying on these Registers will be part of an S-1xx series; for example, S-101 will be the product specification for the next-generation ENC.

## Non-IHO Owners

Other Registers that complement marine navigation or support the activities of national hydrographic authorities can be established in the IHO Registry by relevant organisations. This could be for such things as inland ECDIS services, sea ice reports, maritime weather services and vessel traffic information. In these cases, the relevant competent authority or organisation would control the Register within the rules and procedures of the IHO Geospatial Information Registry as a whole. Those owners would have full control over the compilation and maintenance of their Registers and any product specifications that they may wish to derive. Registers for sea ice information and inland ENCs are already in the process of being established.

Other product specifications that rely or reference some of the S-100 Features and Feature Attributes in the IHO Registry but that have more distant relationships to the primary marine navigation roles of national hydrographic authorities would usually be established elsewhere as part of the ISO 9100 series of standards. Any Registers and product specifications for these would then be organised, authorised and maintained by the appropriate non-IHO competent authorities under their own Registry arrangements. Examples might include maritime spatial data infrastructure (MSDI), oil and gas industry applications, and coastal zone/littoral management applications.

Product specifications for non-IHO products and standards should be distinguishable from the IHO S-1xx series.

### Benefits

There are a number of benefits to be gained from adopting S-100.

Using ISO-developed components and terminology will help ensure that S-100 and future extensions are in the mainstream of the geospatial information industry. This will help to encourage a greater use and thereby lower costs in implementing S-100 for hydrographic and other types of geospatial applications; for example, marine GIS.

Conformance with the ISO/TC211 standards will maximise the use of commercial-off-the-shelf (COTS) software applications and development.

New components of S-100 will not be developed in isolation from the rest of the geospatial information technology community.

Any new requirements can be incorporated within the established framework of ISO/TC211-based standards.

Rather than being regarded as simply a standard for hydrography, S-100 will be interoperable with other ISO/TC211 standards and profiles such as NATO DIGEST.

Users will be able to define applications and product specifications by drawing upon any combination of elements from any of the ISO 19100 series, including S-100.

S-100 will also allow for a much more flexible and manageable change control structure. Because the content of S-100-based product specifications will be a subset of S-100, this will allow the core standard to evolve (through extension) without the need to introduce new versions of product specifications.

There are many national standards bodies that will take full advantage of S-100 being aligned with ISO/TC211 standards.

Compatible hydrographic data will be available to more than just hydrographic offices and ECDIS equipment users.

### Effect on S-57 ENC and ECDIS

ENC data conforming to S-57 Edition 3.1 will continue to be a requirement for type-approved, IMO-compliant ECDIS for the foreseeable future – even after S-100 becomes an active standard. As a consequence, hydrographic offices will continue, as at present, to produce Edition 3.1 ENC data to support this.

The next-generation ENC product specification based on S-100, which will be known as S-101, will take several years to develop and test, and will involve the active participation of all IHO stakeholders. It will have forwards compatibility with S-57 ENCs; that is, an S-101 ECDIS will accept S-57 ENCs. This means that the managed introduction of S-101 will not result in the withdrawal or early termination of S-57 or S-57 ENCs.

### Timetable

The first draft of S-100 – IHO Geospatial Standard for Hydrographic Data was released for stakeholder comment in March 2008. S-100 is not expected to be an effective standard until at least 2010.

### Stakeholder Involvement

Stakeholder involvement will play an important part in the development of S-100. The IHB hosted its first stakeholders' user requirements workshop in March 2008. All potential S-100 stakeholders are encouraged to participate in S-100 development. In particular, non-IHO stakeholders are needed to ensure that S-100 will be suitable for the widest possible user community. Further details about S-100 and how to participate are available at web reference 2.