Paper for Consideration by S100WG TSM

IALA Progress on S-2XX Product Specifications Development

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Executive Summary:	This paper provides an update to development of IALA's S2XX Product Specifications.
Related Documents:	IALA Guideline No. 1106 on Producing an IALA S-100 Product Specification, Edition 1, December 2013 IALA Guideline No. 1087 on Procedures for the Management of the IALA Domains under the IHO GI Registry, Edition 2, December 2013 IALA Recommendation e-NAV-147 on Product Specification Development and Management, Edition 1, May 2015
Related Projects:	S100 Testing in General

Introduction/Background

The IHO S-100 Universal Hydrographic Data Model was published as an international standard in 2010. One objective of S-100 is to provide an ISO-conformant registry, managed by the IHO, containing registers such as feature concept dictionaries and product feature catalogues that are flexible and capable of managed expansion; another objective is to provide separate registers for different user communities. There is a Memorandum of Understanding between the IHO and IALA, which was signed in 2001 and covers work on the IHO Registry. Within the IHO Registry, external Submitting Organizations may use "Supplementary Registers". There are two aspects to IALA's participation. The first is to participate as a Submitting Organization. The second is to become a domain owner under the Registry. At its 57th session, IMO NAV agreed to the use of the IHO Registry as a baseline for the collection, exchange, and distribution of data. At the same meeting it was proposed to set up an IMO/IHO Harmonization Group on Data Modeling (HGDM), which is tasked with establishing the Common Maritime Data Structure (CMDS). As a Domain Owner within the IHO Registry, IALA can expect to contribute to the HGDM and to the CMDS. At its 52nd session, the IALA Council approved registration of IALA at IHO as a Domain Owner for Aids to Navigation (AtoN), VTS and for other data areas under IALA's remit, and as a Submitting Organization, in accordance with the IHO/IALA Memorandum of Understanding (MoU). Because of IALA's breadth of expertise in AtoN, IALA domains within the IHO Registry are logical extensions of the Registry beyond hydrographical applications. The IHO continues to handle operation of the Registry; the responsibility for the management of the IALA domains rests with IALA. Other Submitting Organizations will be able to propose amendments to existing Registry entries. As a benefit, IALA gains synergies regarding definition procedures, operational resources, and international standing. This approach is in line with the terms of reference of the proposed HGDM. IALA will serve as a Submitting Organization to support its requirements for product specifications. A "product" is in most cases understood as a technical or operational data service provided to the mariners and to the maritime community at large. IALA will act as Domains Manager for the IALA Domain of the IHO GI Registry. The Domains Manager is responsible for the entries in the different registers of the Registry and the overall management of the submission process of Product Specification and Features. The Domains Manager is also responsible for the harmonization process with regard to register entries among Field Managers and other Domain Owners. A Data Modeling working group (DMWG) was established within the IALA ENAV Committee during the 2010-14 period and this role has continued under a Harmonization WG in the 2014-18 period. The DMWG produced a Guideline (1106) setting out the process for preparing S-100 product specifications and considerable progress has been made towards development of S-201 on AtoN Information.

Analysis/Discussion

At IALA ENAV16, Mr. Nick Ward (UK) submitted a paper outlining IALA's "S-200 – Status & Way Forward". Below is a synopsis of that report:

Current Status

A supervisory structure (IALA Guideline 1087) has been established within IALA to manage its Domain, which, with the approval of IHO, has been allocated the numbering series S-200 to S-299. It has been found that the process of developing product specifications is quite time consuming and requires expertise in data modeling that is not generally available. This has held up completion of S-201 and has limited progress on other applications. Another product specification on VTS Data Exchange has been delayed for a different reason. It was recognized that this application involved continuously streamed data, rather than batch transmission. S-100 in its current form is not suited to this type of use and a dialogue was started between IALA and IHO to find a way to resolve this problem. That work is continuing. The current status of the IALA S-200 series Product Specifications is shown in the Annex. IALA is committed to the use of the S-100 model for standardizing data exchange in the services its

members provide and Guideline 1106 should be followed, wherever appropriate. However, it is recognized that S-100 may be too complex for some of the simpler applications. Therefore, a more flexible approach may be appropriate in some cases.

Proposed Approach

It is suggested that a template can be designed, incorporating the essential aspects of S-100, but omitting some of the steps that were required for rigorous, geo-spatial applications, such as electronic navigational charts (ENC). For example IALA has a need to format the database it holds on Differential GNSS stations. This is geo-spatial data, in the sense that it includes the positions of the stations in latitude and longitude, but these positions are not used directly for location or navigation. Therefore a less rigorous treatment of the position data can be adopted. There is also no need for a formal data model, using UML, since the information needed can be set out in a simple table. However, the data can be encoded in XML (Extensible Markup Language) for exchange of information between service providers, hydrographic offices and with manufacturers of receivers, for example. In other cases, such as the supporting data used with some radio-navigation systems, like Loran, the data can again be in tabular form, but encoding in XML may not be appropriate, as this data can be used directly by receivers and the overhead associated with XML may cause undesirable delays in transfer. In fact S-100 does not define specific encoding formats, so use of a more efficient format should be perfectly acceptable. These examples point towards a more flexible approach that applies the standard requirements of S-100 where necessary, but allows deviations when appropriate and beneficial. In fact S-100 allows for such options, only giving UML and XML as examples of how a Product Specification might be implemented.

Note: The U.S. Coast Guard is providing ATON data to the U.S. Hydrographic offices (NOAA, USACE, & NGA) in XML format with the expected goal of complete automation of the current manual Chart Updating Services methods.

Conclusions

It can be seen that the complexities in S-100 are not obligatory and the standard allows for simpler approaches where appropriate. The advantage of retaining the overall structure of S-100 for all data products is that it ensures compatibility of applications and facilitates standardized data exchange.

Annex

PS No.	Title	Developer	Field Manager	Status
S-201	Aids to Navigation Information	IALA TG1	N Ward nick.ward@gla-rrnav.org	Under development
S-210	Inter VTS Exchange Format	VTS WG2	R Hoogendoorn rene.hogendoorn@hitt.nl	Under development
S-220	Maritime Safety Information	DMA	O Borup obo@dma.dk	Under development
S-230	Application Specific Messages	e-NAV WG	P Hooijmans peter.hooijmans@rws.nl	Planned
S-240	DGNSS Station Almanac	IALA	Y Cho cho@iala-aism.org	Completed for review
S-245	eLoran ASF Data	GLA	P Williams paul.williams@gla-rrnav.org	Under development
S-246	eLoran Station Almanac	GLA	P Williams paul.williams@gla-rrnav.org	Planned

※ Allocation of numbers is provisional

Action Required of S100WG TSM

The S100WG TSM is invited to consider IALA's work to date and provide comments.