THIRTEENTH MEETING OF THE CBSC (CBSC13)
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Information on S-100 Basic Training Course

Submitted by: Republic of Korea (ROK)
Executive Summary*:* This paper aims to share relevant information on coordinating training courses and workshops effectively to prepare for the S-100 based hydrographic service in the near future.

Introduction – Background

The S-100 standards were designed to replace the existing S-57 IHO Transfer Standard for Digital Hydrographic Data, but they were also developed to support a greater variety of digital data and products related to hydrography. The S-100 standards, together with images, grid data, 3D and time-varying data, contain geographical models to support new applications beyond the scope of hydrographic data products. They also enable developing standards for high definition seafloor topography, marine GIS, and non-spatial data.

Through the generality of the S-100 standards and the relevance to the ISO 19100 series geospatial standards, the International Maritime Organization (IMO) adopted the S-100 to be the framework for developing e-Navigation data standards. The S-100 Geospatial Information Registry, a core element of the S-100, is similar to the concept of an e-library, and functions to be an information system for setting up and managing compatible data product standards. It also supports a dynamic catalogue which enables updates of data products and exchanges.

The IHO is endeavouring to develop S-100 related standards, including the S-100 Registry, and is expecting the S-100 standards to make a huge impact on national hydrographic services, starting from the application of S-101 Next Generation ENC.

Therefore, the KHOA designed training courses which hydrographers would need in the future to prepare for the S-100 based products and the KHOA wishes to share the information with the Member States.

Demands on S-100 related course

According to the S-100 Master Plan and the S-100 Test Bed Plan designed by the IHO, the S-101 will be completed by 2018 and is expected to be applied in the international hydrographic community. As the development of the S-100 standards and the application of hydrographic service by the IHO are becoming visible, training courses for the S-100 stakeholder groups are required in order to support the capacity building of the S-100 standards.

The S-57 is only used in producing ENCs, whereas the S-100 is used as a basis for producing a variety of hydrographic products. Therefore, the S-100 must be understood by

hydrographers as well as non-hydrographers, which leads to a need in capacity building programmes.

The S-100 standards are expected to be used not only in the hydrographic field, but also in maritime safety (IMO), Aids to Navigation (AtoN), and many other non-hydrographic fields, so training courses which will help the direct and indirect S-100 stakeholder groups with capacity building are needed.

Analysis of previous course

Regarding S-100 related training courses so far, an IHO capacity building programme and a seminar by the IALA were organized, and one capacity building programme has been planned in 2015.

S-100 Seminar by the EAHC (2013)

(Category)	(Content)
Title	Seminar on S-100
Date and Venue	9-13 September 2013, KHOA, Busan, Republic of Korea,
Key Presenters	**Lee Alexander (UNH), Jens Schroeder-Fuerstenberg (BSH), Eivind Mong (Jeppesen)**
Trainees (Participants)	Officers from the EAHC Member States
Course Duration & Main Topics	Course Duration: 3 and a half days + 1 day Stakeholders' Forum Main Topics: - Discussion on ENC production system of each MSs - Current Standards for ENC production and distribution - S-100 Overview - TSMAD, SNPWG Activities - Structure and organization of an S-100 based product specification - Consideration for EAHC HOs on S-101 ENC and MSDI - Procedure of develop for Product Spec. Based on S-100 - Practical exercise creating S-10X – Using the S-10X template (MSI, Navigational Warning) - e-Navigation and next Generation ECDIS
Key Issues	With a focus on the officers from the EAHC Member States, together with the outline of the S-100 standards, issues which needed to be considered at hydrographic offices were introduced. In addition to the 3-and-a-half-day seminar, a 1-day Stakeholders' Forum was held and various topics were presented in relation to the S-100.

S-100 Workshop by the IALA (2013)

(Category)	(Content)
Title	IALA Workshop on Developing S-100 Product Specifications for e-Navigation
Date and	18-21 June 2013, IALA Paris France

Venue	
Key Presenters	Thomas Richardson (UKHO), Eivind Mong (Jeppesen),
Trainees (Participants)	IALA-participating specialists related to the AtoN, VTS, AIS; e-Navigation coordinators

Course Duration & Main Topics	Course Duration: 2-day seminar + 1-and-a-half-day WG meeting
	Main Topics:
	  - Presentation S-100, S-101
	  - Presentation on Tooling
	  - Presentation and demonstration of Enterprise Architect
	  - The start, how user need leads to a PS
	  - The IALA Product Specification template and Using the IALA Product Specification template
	  - IALA Domains Management
	  - Demonstration of the 'look and feel' of the registry

Key Issues	This S-100 Workshop was organized to develop the required e-Navigation standards by the IALA. The seminar briefly introduced the S-100 standards, and included practical contents on developing the S-20X standards from the perspective of the IALA.

Meanwhile, the 12th CBSC meeting which was held in Brest, France in May 2014 approved the S-100 Seminar proposed by the SWAtHC (South West Atlantic Hydrographic Commission), and the seminar is scheduled to take place in the SWAtHC region in 2015.

Propose Guidelines of the S-100 Training Course

High demands of the S-100 standards are expected not only from hydrographic offices, but also organizations which use hydrographic data, navigational equipment and system developers using hydrographic data, non-hydrographic the International Maritime Organization, International Association of Aids to Navigation and Lighthouse Authorities, and e-Navigation related activities. Therefore the KHOA, based on the experience of having hosted the S-100 seminar in 2013, has planned S-100 training courses as below. In terms of the relevance to hydrography, they can be divided into hydrographic and non-hydrographic fields. Regarding the level, they can be classified into basic and advanced.

(Categories)	Hydrographic	Non-hydrographic (e-Navigation)
Basic Course	S-100 Basic Course	
Advanced Course (Data Provider)	Focus on hydrographic data providers (+Basic Course)	Focus on non-hydrographic data providers (+Basic Course)
Advanced Course (Application)	Focus on application system of hydrographic data (+Basic Course)	Focus on application system of non-hydrographic data (+Basic Course)

Since basic courses include the basics of the S-100 standards, they are applicable to both hydrographic and non-hydrographic fields.

Advanced courses may be categorized into one with a focus on hydrographic data providers

and the other on application system of hydrographic data. The hydrographic field includes contents specialized in hydrographic offices or hydrographic data, and the non-hydrographic field includes e-Navigation.

This information paper, together with the Annex, proposes 3-and-a-half-day training course and its schedule on the S-100 Basic Course. (See Annex for the S-100 Basic Course Training Schedule)

In addition, the KHOA provided an online S-100 seminar in 2013 (http://trdc.eahc.asia/sub01/sub05_01.asp?code1=4&code2=1), and the newly established course is also going to be run online.

Conclusion and Recommendations

As the S-100 standards are essential not only in hydrography but also in e-Navigation, the IHO needs to develop the S-100/S-10X standards and capacity building programmes to promote them. This information paper has analysed the S-100 related seminars conducted within and outside of the IHO and outlines their characteristics. It has also designed basic and advanced courses taking into account the different capability of the participants. The KHOA hopes it would be used as a reference when designing S-100 training courses by the IHO.

Action Required by the CBSC

- Comments on the S-100 Training Course (mentioned in the paper).
- Review the need for the guidelines of the S-100 Training Course.

Annex. Proposed Training Schedule on the S-100 Basic Course

Time	Day 1	Day 2	Day 3	Day 4
09:00 ~ 09:45	Orientation and Introduction of S-100 seminar	S-100 Registry Register / FCD	Procedure of develop. For Product Spec. Based on S-100	S-100 and e-Navigation
10:00 ~ 10:45	S-100 Overview (Background & History)	S-100 Portrayal (Part 9)	Structure and organization of S-101 including Development schedule of S-101	IMO/IALA activities relating to S-100
11:00~ 11:45	Conceptual Schema Language (S-100 Part 1)	Changes from S-100 Edition 1.0.0 to 2.0.0, and why they happened	Consideration for preparing transition from S-57 ENCs to S-101 ENCs + MSDI	Examples of e-nav Test bed project
13:00 ~ 13:45	General feature model (S-100 Part 3)	TSMAD (S-100WG) activities relating S-100	Structure and organization of S-10X (NPUB: MPA, Radio Signal)	Discussion & Wrap-up (ALL)
14:00 ~ 14:45	Spatial Schema (S-100 Part 7)	SNPWG (NIPWG) activities relating S-100 including SNPWG work in building the foundation of NP3	Practical exercise in creating S-10X – Using the S-10x template. (MSI, Navigational Warning)	
15:00 ~ 15:45	Open discussion of last days topics (ALL)	Open discussion of last days topics (ALL)	Open discussion of last days topics (ALL)	