

Paper for Consideration by HSSC

[Establishment of an S-100 Infra Center for supporting the implementation of S-100]

Submitted by:	KHOA (Republic of Korea)
Executive Summary:	There are fundamental elements of S-1XX product specifications that should be managed for a real operation phase. This paper delivers the necessity of establishing an S-100 Infra Center for supporting the stable implementation of S-100.
Related Documents:	Roadmap for the S-100 Implementation Decade, HSSC14-04.2A
Related Projects:	KHOA S-100 testbed project

Introduction / Background

The IHO is focusing on developing S-100 for the implementation based on the timeline within S-100 Roadmap. The release of S-100 version 5.0.0 is around the corner and with the development of several S-1XX PSs, the initial stages of S-98 and DF Governance Document have been made available.

For the implementation of S-100, S-1XX PSs need to be stabilized through developed and maintained TDSs and FC/PCs. In fact, the delay in the development of TDSs and FC/PCs retards the development of PSs. Furthermore, S-10X PSs do not end at version 2.0 and will require continuous maintenance. Therefore, this paper proposes a need for establishing a tentatively named “S-100 Infra Center” which will support the management of TDSs and FC/PCs for the implementation of S-100.

Analysis/Discussion

Relationship among S-1XX PS components

Each S-1XX contains various components when it comes to a technical aspect and this is represented in Fig. 1. An FC is produced from an application schema in a common data structure, and its role is absolutely critical as DCEG and GML schema are produced through an FC, and a PC is produced according to the types of features defined in the FC. TDSs include datasets which comply with test scenarios and S-10X FC/PCs. Changes to various S-1XX PSs lead to frequent changes and improvements to FC/PCs. The status of FC/PC and PS development can be found in Annex 1.

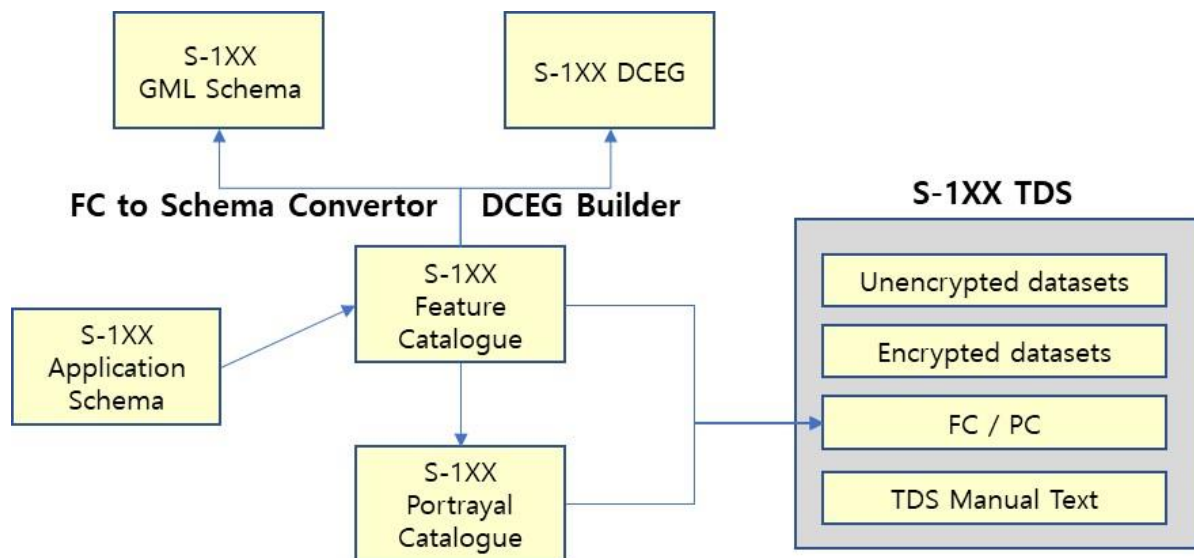


Fig. 1 Relationship among S-1XX PS components

Additionally, the development of S-164 is very critical for S-100 ECDIS. S-100 WG defined the four phases of developing S-164 as below at S-100WG VTC, 6 January 2021:

- Simple conversion: Conversion to S-101 data using S-64
- Extending features and standards: Add native features and complex features; extend S-10x PSs
- Extending functions (1): Strategy for loading data, interoperability phase 1
- Extending functions (2): Interoperability phase 2, display alarms and warnings

S-164 TDS was developed in phase 1 out of the four phases and HSSC13 approved the use of the IHO Special Project Funds for developing phase 2 of S-164. The development timeline is estimated between 12 to 16 months. S-164 TDS should be developed until phase 4 and will require further development. It is expected that a stabilization stage will be required to amend hidden errors and improve it with the experiences from the process of developing S-164. Therefore, we need a dedicated organization who takes the role and function in a long-term, not a one-time project.

Need of the S-100 Infra Center for supporting the implementation of S-100

According to the S-100 Roadmap, the international hydrographic community is looking forward to the implementation of S-100 version 5.0.0 compliant S-1XX PSs from 2024, but whether the timeline can be delivered as planned will depend on the readiness of PSs and the development of S-100 ECDIS, due to various revisions to PSs while operating them.

After developing the operating version of a PS, until it is on stable operation, the IHO Secretariat and WGs request support from Member States or the formation of a Project Team. The process has limitations in terms of speed and continuity. Therefore, it is necessary for the IHO to stably operate the maintenance of detailed PS elements and secure continuity, promptness, and efficiency through the formation of a dedicated organization responsible for the production and update of FC/PC/TDS. The characteristics of each PS element can be summarized as Annex 1.

Advantages of organizing a dedicated organization can be summarized as follows.

- The dedicated organization is entrusted with the role of the IHO to develop industry-neutral TDS.
- After the development of S-164 TDS, errors or corrections occurring during the implementation of S-100 and PSs can be reflected at any time.
- Establish a fixed communication system with the IHO Secretariat, HSSC, S-100WG, and each Project Team in the development and management of essential items such as TDSs and FC/PCs.
- Supporting FC/PC development work, which is commonly included in the development of S-1XX PSs, is expected to speed up and simplify the S-1XX PS development process.
- TDSs and FC/PCs to be ensured its consistency of all PSs within the S-100 Ecosystem.

Conclusions

In order to facilitate stable introduction of S-1XX PSs by Member States based on the S-100 Roadmap, it is necessary to establish the S-100 Infra Center which will maintain and develop additional TDSs and FC/PCs to be included in S-1XX version 2.0.

Recommendations

The HSSC is invited to discuss whether the S-100 Infra Center needs to be established and when such necessity is agreed upon, detailed plans such as human resources and budgets will need to be discussed.

Action Required of [HSSC] [Relevant HSSC WG]

The [HSSC] [Relevant HSSC WG] is invited to:

- a. Consider the need of establishing the S-100 Infra Center
- b. Discuss detailed establishment plans and necessary actions that may be appropriate.

Continued improvements to FC/PC and TDC for operation of S-1XX PSs

Changes to various S-1XX PSs lead to frequent changes and improvements to FC/PCs. An S-1XX PS includes an FC, and as for navigational PSs, a PC is produced. Changes to S-100 standards are denoted as new edition, revision and clarification, and changes to an application schema necessitate the revision of both a FC and a PC.

Leads and status of main Product Specifications and their Feature Catalogues and Portrayal Catalogues

PS	FC	PC	Status
S-101	KHOA / S-100WG	NIWC / S-100WG	FC 1.0.2, PC 1.x.x.
S-102	S-102 PT / S-100WG	S-102 PT / S-100WG	FC 1.x.x, PC 1.x.x
S-104	S-104 PT / TWCWG	S-104 PT / TWCWG	FC 1.x.x, PC 1.x.x
S-111	S-111 PT / TWCWG	S-111 PT / TWCWG	FC 1.x.x, PC 1.x.x
S-121	S-121 PT / S-100WG	S-121 PT / S-100WG	FC 1.x.x, PC 1.x.x
S-122	S-122 PT / NIPWG	S-122 PT / NIPWG	FC 1.x.x, PC 1.x.x
S-123	S-123 PT / NIPWG	S-123 PT / NIPWG	FC 1.x.x, PC 1.x.x
S-124	S-124 PT / WWNWS	S-124 PT / WWNWS	FC 1.x.x, PC 1.x.x
S-126	S-126 PT / NIPWG	S-126 PT / NIPWG	TBD
S-127	S-127 PT / NIPWG	S-127 PT / NIPWG	FC 1.x.x, PC 1.x.x
S-128	KHOA / NIPWG	KHOA / NIPWG	FC 1.0.0, PC 1.0.0
S-129	S-129 PT / S-100WG	S-129 PT / S-100WG	FC 1.0.0, PC 1.0.0
S-130	S-130 PT / HSSC	S-130 PT / HSSC	TBD

Main items of the S-100 Infra Center for S-1xx implementation

(1) S-1XX FC/PC

Developers responsible for developing PSs in WG/PTs produce FC/PCs using IHO-provided tools (FCB/PCB) but since those tools are not at commercial software level, the developers need a very good understanding of the FC/PCs. The basic structure of FC/PCs of each PS is the same, however, each group duplicates the development work of FC/PCs for their developments and updates. WG/PTs tasked with producing FC/PCs need support for newly developing and updating FC/PCs required for developing S-1XX PSs.

(2) S-1XX TDS

For S-100 ECDIS to be developed, TDSs should be provided early enough but it has been delayed while developing S-1XX PSs. Phase 1 of S-164 was developed in 2020 and HSSC-13 approved the use of the IHO Special Project Funds for developing Phase 2. S-101 PT created a TDS Sub-group and plans to release S-164 version 1.0.0 in 2023. Once S-164 version 1.0.0 is released, additional requirements will need to be reflected along with technical aspects such as extensibility, interoperability and data loading. Judging from past experience in developing S-64 TDS, a significant amount of time was consumed in stabilizing a new version and it is believed that the fairness, accuracy and agreeability of S-10X TDS will be of utmost importance. Therefore it is necessary to create the S-100 Infra Center for supporting S-100 which can make additional developments after the release of S-164 version 1.0.0 and extend S-1XX PSs in an industry-neutral and prompt manner.

(3) Update of S-100 tools

With the support of KHOA, the IHO improved the S-100 Registry and various PS development tools including the FCB to facilitate the development of S-1XX PSs by MSs. However, it is limited to support the development of such tools through individual projects on an annual basis. If the S-100 Infra Center updates the S-100 PS development tools, they will be able to manage them in close cooperation with the IHO Secretariat/S-100WG/TSM/S-101 PT.