

Paper for Consideration by S-100WG7**Update the S-100 Infra-system to be in line with S-100 Ed. 5.0.0**

Submitted by:	Republic of Korea (KHOA)
Executive Summary:	Updates to the S-100 infra-system in relation to S-100 Ed. 5.0.0 approved in 2022 were identified
Related Documents:	S-100, S-99
Related Projects:	S-100 testbed project

Introduction / Background

1. The IHO and KHOA developed the S-100 infrastructure system to support the development of product standards based on S-100. In 2022, S-100 5.0.0 was approved, and according to the S-100 Implementation Roadmap (2020~2030), S-10X standards require the development of 2.0 operating version to be in line with S-100 5.0.0.
2. Since the update of the S-100 infrastructure system is required in relation to the revision of the S-100 5.0.0, updates and plans for the S-100 infrastructure system are presented.

Analysis/DiscussionS-100 GI Registry

3. Regarding the S-100 5.0.0, the following applies to the S-100 Registry.
 - Apply the proposal process of Concept/Data Dictionary Register and revised S100_CD_Information class was introduced.
 - Added 15 portrayal type like Display Mode, Display Plan (Part 9-13.3.15)
4. Items that require updating of the S-100 Registry are as follows:
 - Add and change Portrayal Register item Type (Part 2b-4.1)
 - ◆ Delete: Cascading Style Sheet
 - ◆ Change: Colour Profile → Colour Palette, Display priority → Drawing Priority
 - ◆ Add: Colour Value, Alert, Alert Message, Alert Highlight
 - Apply deactivation of Portrayal Register ㄹ Viewing Group and Associated Viewing Group Layer
5. Other enhancements to the S-100 Registry include:
 - Registration and management of UOM (Unit Of Measure) and Constraints
 - Registration and management of Association and Role
 - Database redundancy for stable Registry operation
 - Unification of individual DB connection functions such as S-100 Tool-Kit into an integrated API

Feature Catalogue Builder

6. In S-100 5.0.0, the FC data model was partially revised as follows, and revisions to the FCB interface and FC structure were required.
 - Add Product ID
 - Change of binding of Feature type and Information type from 1 to 1~*
 - Change of namespace used in FC

- Update of FC XML Schema

7. Currently, many S-10X product specifications use S-100 4.0.0-based FC, so it was determined that FCB needs to support S-100 4.0.0-based FC and S-100 5.0.0-based FC. Since the current version of the S-100 FCB is version 2.3.2, KHOA decided to separate the S-100 FCB SW and manage it as follows:

- S-100 FCB 2.3.2 → S-100 FCB 2.4.0 (Editing S-100 4.0 based FC and converting to S-100 5.0.0 based FC)
- S-100 FCB 2.3.2 → S-100 FCB 3.0.0 (Editing S-100 5.0.0 based FC)

8. Support for S-100 4.0.0 is to be maintained until the end of 2023, and if there is a problem with the development of product specifications, please discuss with KHOA

9. KHOA completed the development of FCB 2.4.0 and FCB 3.0.0 and updated S-100 Toolkits in relation to FCB update to be in line with S-100 5.0.0 to support S-101 FC 1.1.0.

Portrayal Catalogue Builder

10. The PCB developed by KHOA was developed to support XSLT-type rule files and PC catalogue production. Due to extensive changes in Part 9 Portrayal parts of the S-100 5.0.0, a significant revision to the PCB was required. The originally developed PCB supported the production of various rules according to the combination of primitive and attribute values, but it was evaluated that it was difficult to create rules in all cases, and the following update method was proposed.

- Manual creation and editing of Rule files is recommended
- PCB is developed and changed to a tool that can create PC catalogue by registering manually edited Rules.
- Expanded functions to include Alert & Indication catalogue

11. When maintaining the function of creating complex and various rules, it is difficult to put the PCB to practical use, and we suggest an update plan with a professional tool for the production and management of PC catalogue.

DCEG Composer

12. DCEG Composer is a tool that supports DCEG production by configuring DCEG basic templates using S-10X FC and inputting remarks for each feature type and information type. DCEG Composer is closely related to the FC data structure. As S-100 5.0.0 changes, the binding structure of Feature and Information type changes, so this needs to be updated.

13. Since DCEG Composer requires support for S-100 4.0.0-based FC and S-100 5.0.0-based FC like FCB, it is necessary to separate the program version.

KHOA S-100 Viewer

14. The S-100 Viewer developed to support the S-10X FC/PC/TDS test has the S-100 GI Registry 1.0.0 version posted, and the revised version is maintained on GitHub. The results of S-100 Viewer operation during the reporting period are as follows:

- 6 upgrades from version 1.0.12 to 1.0.17
- S-10x GML editing function (prototype), improved conformity to S-100 portrayal standard, S-102 2.1.0 support
- Improvement of other user convenience functions, etc.
- Improved system stability and functions by resolving issues registered by users

15. OpenS-100, an open source version of KHOA S-100 Viewer, was released, and the main use cases of KHOA S-100 Viewer are as follows:

- Review of pilot-produced S-10X data
- KHOA's S-100 data test
- Applied to the development of the S-98 interoperability catalogue

16. In future updates, we plan to improve S-100 5.0.0 support, S-101/S-10X exchange set and metadata support, and S-98 interoperability catalogue support.

Other Tools

17. Tools other than those discussed above are evaluated to have relatively low utilization. KHOA wants to collect WG's opinion on maintenance of related tools, and if the WG decides to discontinue the tool, KHOA will maintain the current version for the time being and will focus on developing major tools.

18. Since there are no significant changes in the symbol part in the S-100 5.0.0, there is no direct modification of the symbol editor, but some of the errors and improvements identified in the process of creating and editing SVG symbols have been completed, and additional updates are planned.

19. The FC to Document tool is a tool that supports the conversion of FC data into a human-readable document. As the FC structure has been partially changed to be in line with S-100 5.0.0, it has been identified that a functional change related to FC data loading is required

Update plan of S-100 infra-system

20. According to the S-100 Implementation Roadmap, the S-10X product specification belonging to Step 1 and Step 2 requires an operating version update of version 2.0 to be in line with S-100 5.0.0, and an S-100 infrastructure system update is required to support it.

Number	S-100 Infra-system	Update plan of S-100 5.0.0
1	S-100 GI Registry	2023 ~ 2024
2	FCB	Complete in 2022, When working S-101 FC 1.1.0, update the tool if needed
3	PCB	2024, Develop changes with manual XSLT Rule management and PC catalogue management tools
4	DCEG Composer	2024, Development of FC loading function to be in line with S-100 5.0.0
5	Symbol editor	2023~2024, Update SVG editing functions
6	FC to Document convertor	2023, Functions will be updated

Action Required of S-100WG

The S-100WG is invited to:

- a. note the update plan of the S-100 infra system to be in line with S-100 Ed. 5.0.0.
- b. provide any comments for the plan.