

Hydrographic Services and Standards Committee

Introduction of S-100 Infrastructure

S-100WG / KHOA

Presented by KHOA (Yong BAEK)



International Hydrographic Organization
Organisation Hydrographique Internationale

HSSC-11, Cape Town, South Africa, 6-9 May 2019

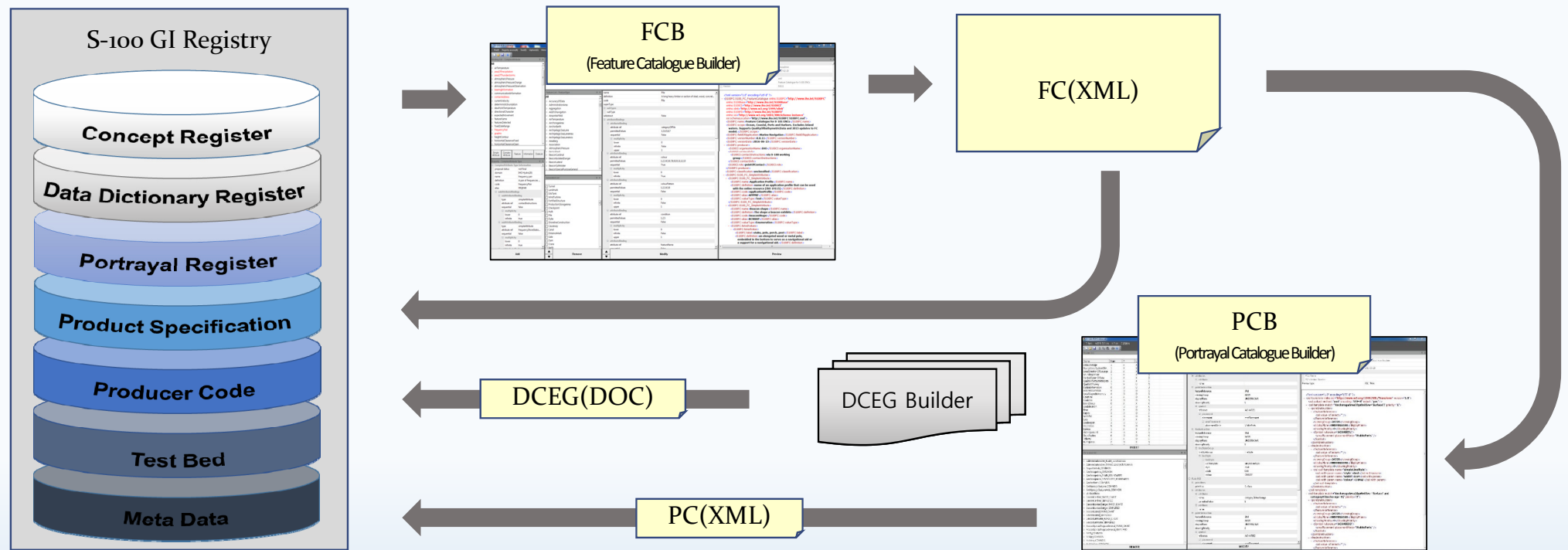
Introduction (1/2)

- **What is S-100 Infrastructure?**
 - **A framework** to support S-100 concept and S-10X product specifications
 - Composed of :
 - S-100 GI Registry
 - Feature Catalogue Builder with FC
 - Portrayal Catalogue Builder with PC
 - DCEG Builder (refer to DCEG builder development)



Introduction (2/2)

- Overview of S-100 Infrastructure status



S-100 GI Registry Improvements

- **Status of S-100 GI Registry**

- 1st phase : Initial interface and DB for FCD (~2015)
- 2nd phase : Update FCD, new Portrayal register (2015~2016)
- 3rd phase : Develop a New S-100 GI Registry (2017~2018)
- 3.1rd phase : Conduct closed-beta test (2019~Present) and ready to RELEASE

- **New Registry now supports :**

- Concept register, Data Dictionary register and Portrayal register.
- S-10X PS development process(Test Bed, Product Specification
- Other registers(Producer Code, Metadata, Document)



S-100 GI Registry Improvements

- **Concept register**

When S-10X developers find a new feature for product specification, they should propose it as concept and get review by register manager and whole domain control body to enhance data consistency/harmonization and avoid duplication

- **Data Dictionary register**

Concepts can be transferred to features through the Data Dictionary register and uploaded to database and linked with S-100 Feature Catalogue Builder to generate S-10X feature catalogue XML files

- **Portrayal register**

Only 4 types(Symbol, Line Style, Area Fill, Font) was supported over the past years, however NEW Portrayal register supports the whole 19 types which are defined in S-100 standard 3.0



S-100 GI Registry Improvements

- **Test Bed**

Outcomes(e.g. PS document, FC, PC, TDS) of all NEW S-10X development should be uploaded and managed by Test Bed system and they will be reviewed by various of stakeholders before official publish like 1.0.0 and 2.0.0

- **Product Specification register**

When the S-10X PS released officially, it will be moved to Product Specification register and shared to hydrographic users and S-100 Infrastructure

- **Metadata register**

As following the S-100 standard 3.0 and 4.0, Metadata register was developed to support metadata such as exchange catalogue and process of Metadata register refers to Portrayal register



S-100 GI Registry Improvements

S-100 Geospatial Information Registry

S-999 Document

Searching ...

Document

Scope

Abbreviations used in this publication

Objectives of S-100

S-100 Parts

Profiles

Part 1 – Conceptual Schema Language

Part 2 – Management of IHO Geospatial Information

Part 2a – Feature Concept Dictionary Registers

Part 2b – Portrayal Register

Part 3 – General Feature Model

Part 4 – Metadata

Part 5 – Feature Catalogue

Part 6 – Coordinate Reference Systems

Part 7 – Spatial Schema

Part 8 – Imagery and Gridded Data

Part 9 – Portrayal

Part 9a – Portrayal (Lua)

Part 10 – Encoding Formats

Part 10a – ISO/IEC 8211 Encoding Schema

Part 10b – GML Encoding

Part 10c – HDF5 Data Model and File Format

Part 11 – Product Specifications

Part 12 – Maintenance

Part 13 – Scripting

Part 14 – Online Communication Exchange

Part 15 – Encryption and Data Protection

0-1 Scope

S-100 – IHO *Universal Hydrographic Data Model* comprises twelve related parts that develop and maintain hydrographic related data, products and registers. These methods and tools for data management, processing, analysing, accessing, and exchanging data between different users, systems and locations. By following this set of guidelines, the constituent parts of an S-100 compliant product specification.

S-100 conforms as far as is reasonably possible to the ISO TC 211 series of standards for geographic information. S-100 has been tailored to suit hydrographic requirements.

S-100 details the standard to be used for the exchange of hydrographic and related information as well as between other organizations and for its distribution to manufacturers and users.

S-100 comprises multiple parts that profile standards developed by the ISO TC 211 series of standards for geographic information. The objective is that, together, they provide a set of standards for geographic information. S-100 is an example of how these standards can be used.

This standard specifies the procedures to be followed for:

1). establishing and maintaining registers of hydrographic and related information

2). creating product specifications, feature catalogues and a definition of the general data model

3). using spatial, imagery and gridded data, and metadata specifically aimed at facilitating the exchange of hydrographic and related information

S-999 Old & New

Searching ...

Document

Object

Data Coverage

Navigational system of marks

Local direction of buoyage

Quality of Bathymetric Data

Sounding datum

Vertical datum of data

Quality of Survey

Update information

Magnetic variation

Local magnetic anomaly

Coastline

Land area

Island Group

Land elevation

River

Rapids

Waterfall

Lake

Land region

Vegetation

Ice area

Sloping ground

Slope topline

Tideway

Built-up area

Building

Airport/airfield

Runway

Version: 0.1

Version: 0.2

Data Coverage

IHO Definition: Data Coverage. A geographical area that describes the coverage and extent of spatial objects.

S-101 Meta Feature: Data Coverage (M_COVR)

Primitives: surface

Real World

Paper Chart Symbol

ECDIS Symbol

S-101 Attribute

S-57 Acronym

Allowable Encoding Value

Type

Multiplicity

Maximum Display Scale

Minimum display scale

Integer

1.1

1.1.1 Span opening

1.1.1.1 Span opening

If it is required to encode the clearance characteristics (vertical or horizontal) for an opening part of insert a bridge between piers or supports, it must be done using the feature Span Opening, which must be associated with the feature Bridge (see clause X.X) using the association Bridge Aggregation (see clause X.X). See clause X.X for examples of Span Opening features used in conjunction with Bridge features.

The value of the vertical clearance between (high) water level and any opening overhead obstruction must always be given, where known, on the largest optimum display scale ENC data intended for navigation under the overhead obstruction, and for detailed passage planning. The datum above which clearances are given must be a high water level, preferably Highest Astronomical Tide (HAT), where the tide is appreciable. Clearances must be populated using the complex attributes vertical clearance closed and vertical clearance open for the span and sub-attributes populated relevant to the feature, rounded down to the nearest whole metre (unless under 10m, when metres and decimetres may be quoted). In areas where the tidal range is not appreciable the datum above which clearances are given should be Mean Sea Level (MSL).

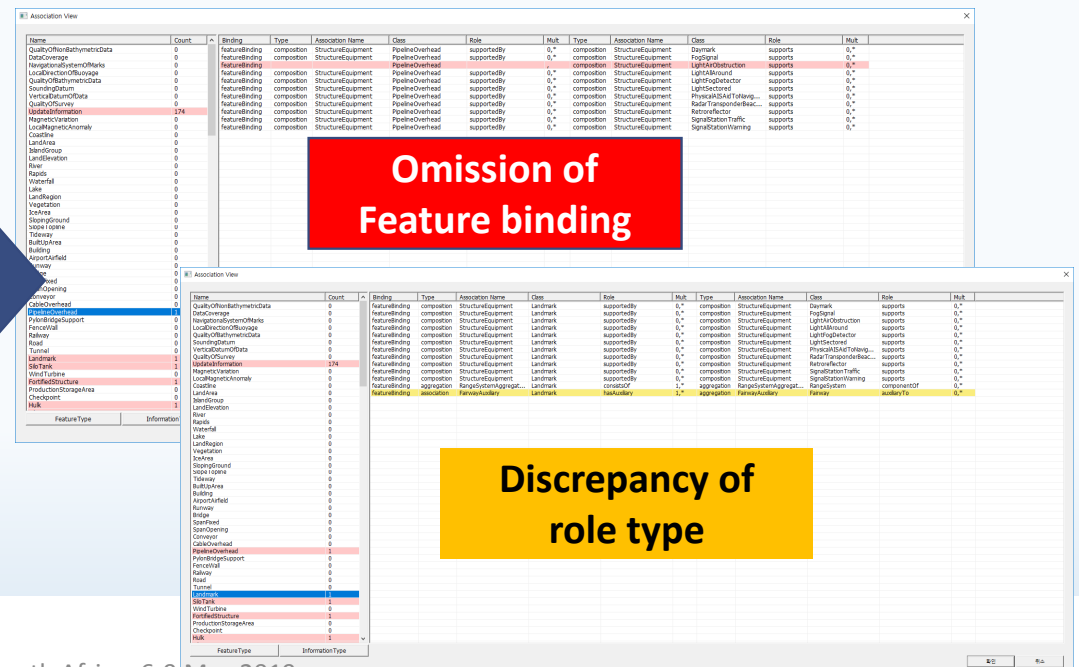
Remarks



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- **(Feature Association Validation)** New tool for feature to check whether feature association (role type, binding information) between feature types facing each other



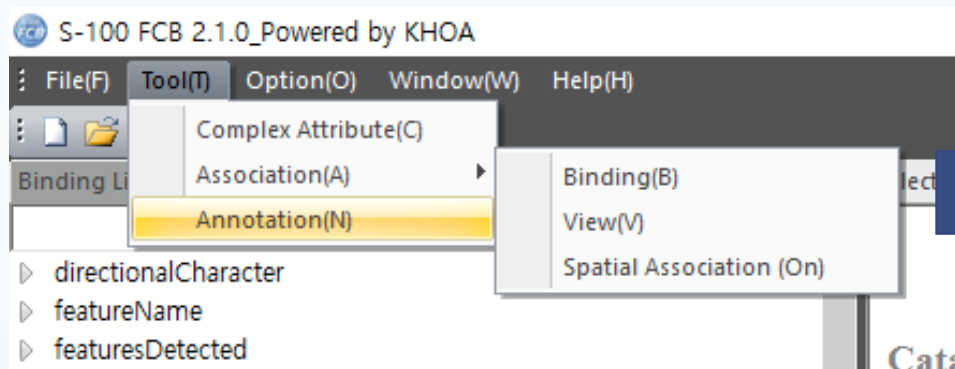
S-100 Feature Catalogue Builder

- **Annotation Function**

- Users can add any annotation to S-10X FC

- **Spatial Association for S-100 Converter**

- New function to add or delete Spatial Association to support S-100 Converter



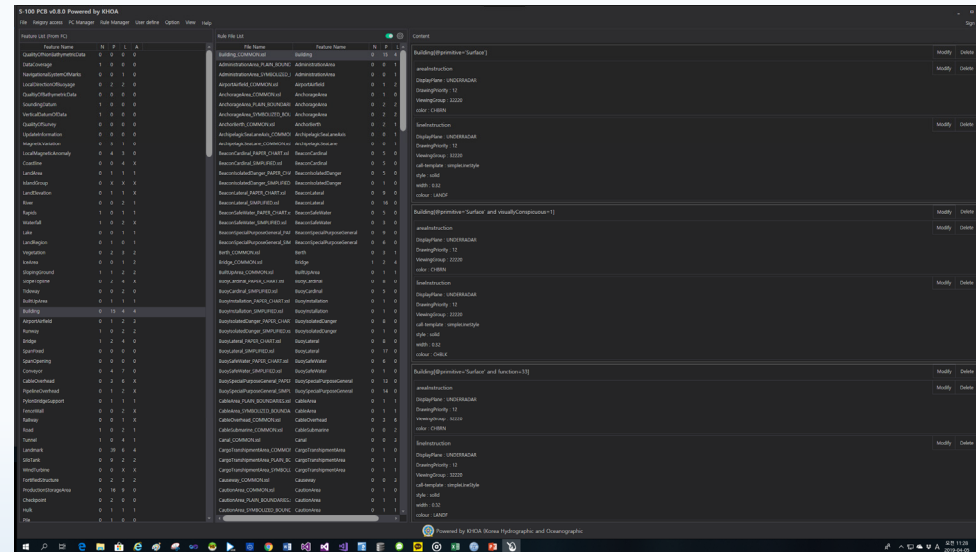
```
</S100FC:S100_FC_InformationAssociation>
<S100FC:S100_FC_InformationAssociation isAbstract="false">
  <S100FC:name>Spatial Association</S100FC:name>
  <S100FC:definition>Spatial Association</S100FC:definition>
  <S100FC:code>SpatialAssociation</S100FC:code>
  <S100FC:role ref="defines"/>
  <S100FC:role ref="definedFor"/>
</S100FC:S100_FC_InformationAssociation>
</S100FC:S100_FC_InformationAssociations>
```



S-100 Portrayal Catalogue Builder

- **S-100 PCB 1.0.0 Release**

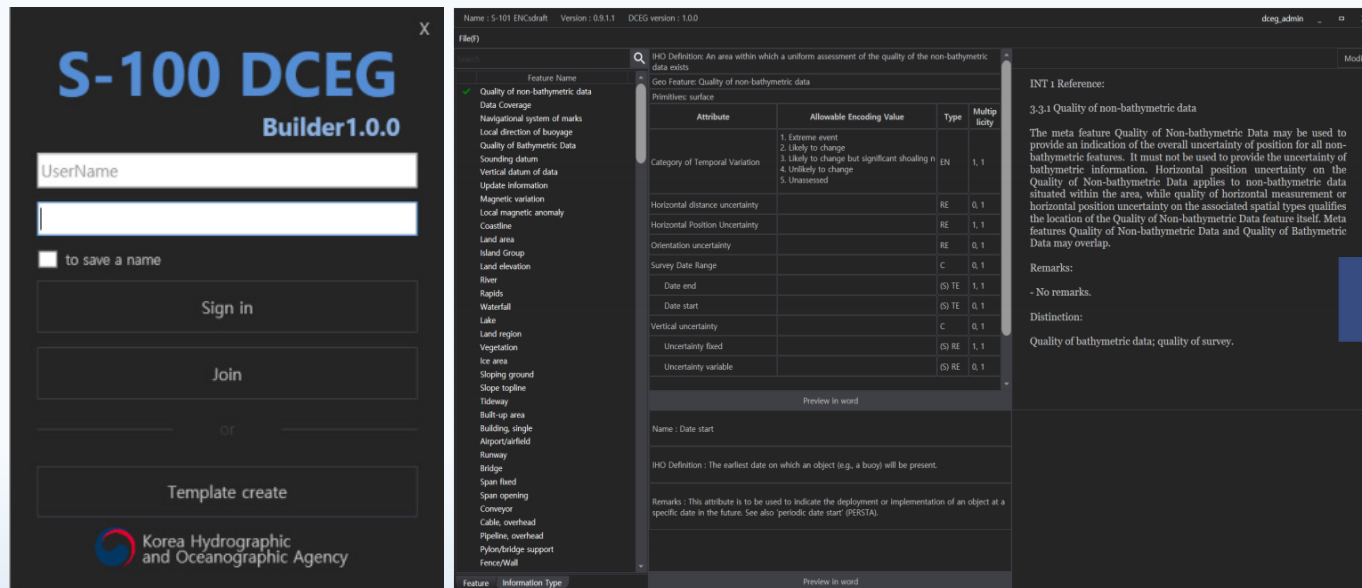
- A new concept of UI was applied to S-100 PCB 1.0.0
- Improved to manage rule files by main and sub
- Provide necessary information (eg, Context Parameter) required to produce PC XML.



S-100 DCEG Builder

- **S-100 DCEG Builder 1.0.0 Release**

- S-100 DCEG Builder supports to generate a S-10X Product Specification's annex such as DCEG(Data Classification and Encoding Guide) document in an easy way by referring S-10X FC XML to load feature information



Part 1 Feature Catalogue

8.18 Dock area			
IHO Definition: DOCK AREA An artificially enclosed area within which ships may moor and which may have gates to regulate water level. (S-57 Edition 3.1, Appendix A – Chapter 1, Page 1.56, November 2009).			
S-101 Geo Feature: Dock area (DOCARE)			
Primitive: Surface			
		ECDIS Symbol	
Allowable Encoding Value	Type	Multiplicity	
tidal	EN	0.1	
non-tidal (wet dock)	EN	0.1	
2 : under construction	EN	0.1	
3 : ruined			
5 : planned construction			
Feature name	C	0.1	
Display name	(S) BO	0.1	
Language	ISO 639-3	0.1	
Name	(OBJNAM) (VOBJNAM)	(S) TE 1.1	
Fixed date range	C	0.1	
Date end	(DATEND) ISO 8601: 2004	(S) TD 0.1	
Date start	(DATSTA) ISO 8601: 2004	(S) TD 0.1	
Horizontal clearance fixed	C	0.1	
Horizontal clearance value	(HORCLR)	(S) RE 1.1	
Horizontal distance uncertainty	(HORACC)	(S) RE 0.1	
Horizontal clearance length		RE 0.1	
Horizontal clearance width		RE 0.1	
Maximum permitted draught		RE 0.1	
Reported date	(RORDAT)	ISO 8601: 2004	
Status	(STATUS)		

**Part 2
Encoding guide**

INT 1 Reference: F 27, 28

8.18.1 Tidal and non-tidal basins (see § 4 – B-325)

If it is required to encode a non-navigable dock area, it must be done using the feature **Dock Area**.

Remarks:

- If the dock is navigable at the maximum display scale of the ENC data, it must be encoded using the features **Depth Area**, **Dredged Area** or **Unsurveyed Area** (see clause 8.2.4), and the geo features making up the dock limits must be encoded using appropriate features such as **Coastline**, **Shoreline Construction** or **Gate**. The dock must not be encoded as **Dock Area**. If it is required to encode the name of the dock, it



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Future Plans

- **S-100 GI Registry**

- Migration from the registry 2.1(FCD) to the New registry 3.1 version

- **Other Infrastructures**

- S-100 FCB, PCB : Connection task with the new Registry 3.1 version
- DCEG Builder : Test and improve with PS developer co-work



Action requested of HSSC 11

- **Note** the report.
- **Request** to provide recommendations and feedbacks if any.

