

Paper for Consideration by S-101PT4
Report on S-101 Feature Catalogue 1.0.0 Creation

Submitted by:	Republic Of Korea (KHOA)
Executive Summary:	This paper describes the management process for feature association and role
Related Documents:	S-100, S-101, TSM6-7.1A, S-100WG4-6.12
Related Projects:	KHOA S-100 Test Bed Project

Introduction / Background

KHOA has tasked to create and update the S-101 Feature Catalogue (FC) according to the S-101 DCEG. This paper is to report the activities and issues in order to update the S-101FC

Analysis

Activates on creating S-101 Feature Catalogue

For the S-100 standard activation and application, KHOA started to take charge of the S-101 FC creation and management. KHOA reported the S-101 FC 0.9.1 based on the S-101 DCEG(ver. July 2018) at the TSM6 meeting in 2018 and reported the new S-101 FC 0.9.2 following the S-101 DCEG(ver. November 2018) at S-100WG4 meeting in 2019 for stakeholder's review. After the updates and revision, the S-101 FC 1.0.0 was released officially in December 2018 following the official S-101 DCEG 1.0.0(ver. December 2018)

In this paper, KHOA reports the S-101 FC 1.0.0 creation results and related errors and discrepancies at S-101 DCEG 1.0.0 document.

Comparison tool in the S-100 FCB

S-100 FCB(Feature Catalogue Builder) is a tool to create S-10X FC files. Users shall bound features and information following their S-10X DCEG document to create S-10X FC. The new improved S-100 FCB 2.1.0 shall identify errors (difference) through the validation function if the type and name of the association bound to feature are different or missing through its internal solution..

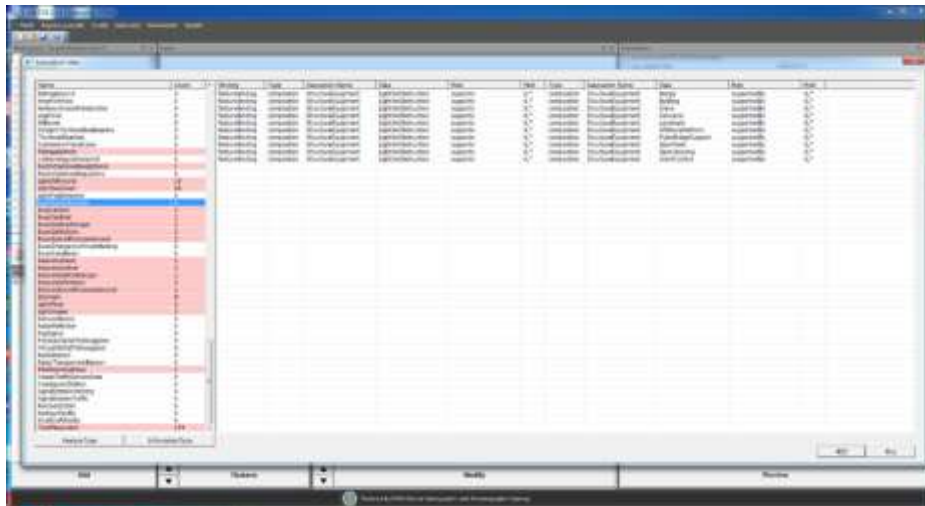


Figure 1. Feature association validation tool

Discussion

Feature association issue of features

- 1) Association binding

19.E Air obstruction lights

IHO Definition: AIR OBSTRUCTION LIGHT. A light is a Dictionary – S-32).
An air obstruction light is a light marking an obstacle which Dictionary – S-32).

S-101 Gen Features: Light Air Obstruction (LIGHTS)

Primitives: Point

Feature-Information associations

Type	Association Name	Association Ends						
		Class	Role	Mult	Class	Role	Mult	
Comp	Structure/Equipment	Light Air Obstruction	Supports	0..*	Bridge, Building, Crane, Conveyor, Landmark, Offshore Platform, Pylon/Bridge Support, Span Fixed, Span Opening, Wind Turbine	Supported by	0..1	

E.10 Pipeline, overhead

IHO Definition: OVERHEAD PIPELINE. A string of interconnected pipes, supported by pylons and passing pylon, used for the transport of matter, nowadays mainly oil or gas. (Adapted from S-57 Edition 3.1, Appendix A – Chapter 1, Page 1.118, November 2000).

S-101 Gen Features: Pipeline Overhead (PIPOND)

Primitives: Pipe/Chart Symbol, ECDIS Symbol

Feature-Information associations

Type	Association Name	Association Ends						
		Class	Role	Mult	Class	Role	Mult	
Comp	Structure/Equipment	Pipeline Overhead	Supported by	0..*	Light Air Obstruction, Light Air Around, Light Fog Distress, Light Saccorod, Physical AIS Aid to Navigation, Radar Transponder Beacon, Retroreflector, Signal Station Traffic, Signal Station Warning	Supports	0..*	

Figure 2 Discrepancy of association binding (omission)

At figure 2, Pipeline overhead has Air obstruction lights as an association, but Air obstruction lights doesn't have Pipeline overhead as an association. This seems like an S-101 DCEG discrepancy

2) Association type

S.4 Pile

IHO Definition: PILE. A long heavy timber or section of steel, wood, concrete, etc., forced into the earth or sea floor to serve as a support, ab for a pier, or to resist lateral pressure, or a free standing pile within a marine environment. (IHO Dictionary – S-32).

S-101 Gen Features: Pile (PILPNT)

Primitives: Point, Curve, Surface

Feature-Information associations

Type	Association Name	Association Ends						
		Class	Role	Mult	Class	Role	Mult	
Comp	Structure/Equipment	Pile	Supported by	0..1	Daymark, Day Signal, Light Air Obstruction, Light Fog Distress, Light Saccorod, Physical AIS Aid to Navigation, Radar Transponder Beacon, Retroreflector, Signal Station Traffic, Signal Station Warning	Supports	0..*	
Aggr	Range System Aggregation	Pile	Consists of	1..*	Range System	Component of	0..1	
Assoc	Aids to Navigation Association	Pile	Consists of	1..*	Archipelagic Sea Lane, Fairway System, Bridge, Deep Water Route, Two-Way Route	Component of	0..1	
Aggr	Fairway System	Pile	has auxiliary	1..*	Fairway	Auxiliary to	0..*	

S.17 Fairways

IHO Definition: FAIRWAY. That part of a river, harbour and so on, where the main navigable channel for vessels of larger size lies. It is also the usual course followed by vessels entering or leaving harbours, called "ship channels". (International Maritime Dictionary, 2nd Edition)

S-101 Gen Features: Fairway (FAIRWY)

Primitives: Surface

Feature-Information associations

Type	Association Name	Association Ends						
		Class	Role	Mult	Class	Role	Mult	
Aggr	Fairway Aggregation	Fairway	Consists of	2..*	Fairway System	Component of	0..1	
Assoc	Aids to Navigation Association	Fairway	Auxiliary to	0..1	Beacon Cardinal, Beacon Isolated Danger, Beacon Lateral, Beacon Safe Water, Beacon Special Purpose/General, Buoy Cardinal, Buoy Emergency, Buoy Marking, Buoy Isolated Danger, Buoy Lateral, Buoy Safe Water, Buoy Special Purpose/General, Caution Area, Diamond Obstacle, Area, Light Flot, Light Vessel, Landmark, Pile, Range System, Recommended Route Consecutive, Recommended Route Transverse, Restricted Area Navigational, Restricted Area Regulatory, Sweep Area	Has auxiliary	1..*	

Discrepancy of Association type
Piles has association as Aggregation
Fairways has association as Association

Figure 3 Discrepancy of association type or association name

At figure 3, Fairways has Pile as an Association type, but Pile has Fairways as an Aggregation type. Because they face each other, Pile and Fairways must use the same association type. This seems like an S-101 DCEG discrepancy.

3) Faced features association issue

19.2 Light all around								19.3 Sector lights							
Feature/Information associations								Feature/Information associations							
Type	Association Name	Class	Role	Association Ends											
				Mult	Class	Role	Mult								
Comp	Structure/Equipment	Light All Around	Supports	0,1	Beacon Cardinal, Beacon Isolated, Danger, Beacon Lateral, Beacon Safe Water, Beacon Special Purpose/General, Bridge, Building, Buoy Cardinal, Buoy Emergency, Buoy Marking, Buoy Installation, Buoy Isolated, Danger, Buoy Lateral, Buoy Safe Water, Buoy Special Purpose/General, Crane, Conveyor, Daymark, Floating Facility, Floating Dred, Fertilized Structure, Hulk, Landmark, Light All Around, Light Float, Light Vessel, Mooring/Warping Facility, Offshore Platform, Pile, Pipeline Overhead, Pylon, Pylon/Bridge Support, Shoreline Construction, Silo/Tank, Span Float, Spin Opening, Wind Turbine	Supported by	0,1	Comp	Structure/Equipment	Light Sectored	Supports	0,1	Beacon Cardinal, Beacon Isolated, Facility, Floating Dred, Fertilized Structure, Hulk, Landmark, Light All Around, Light Sectored, Light Float, Light Vessel, Mooring/Warping Facility, Offshore Platform, Pile, Pipeline Overhead, Pylon, Pylon/Bridge Support, Shoreline Construction, Silo/Tank, Span Float, Spin Opening, Wind Turbine	Supported by	0,1
Comp	Structure/Equipment	Light All Around	Supported by	0,1	Fog Signal, Light All Around, Light Fog Detector, Retroreflector	Supports	0,1	Comp	Structure/Equipment	Light Sectored	Supported by	0,1	Fog Signal, Light Fog Detector, Retroreflector	Supports	0,1
App	Range System	Light Sectored	Consists of	1,*	Range System	Component of	0,1	App	Traffic Separation Scheme	Light Sectored	Consists of	1,*	Traffic Separation Scheme	Component of	0,1
Asso	Acts to Navigation Association	Light Sectored	Consists of	1,*	Archipelago, Sea Lane, Bridge, Deep Water Route, Farway System, Traffic Separation Scheme, Two-Way Route	Component of	0,1	Asso	Acts to Navigation Association	Light Sectored	Consists of	1,*	Archipelago, Sea Lane, Bridge, Deep Water Route, Farway System, Traffic Separation Scheme, Two-Way Route	Component of	0,1

Figure 4 Feature association (between light all around and light sectored)

At the left side of figure 4, Light all around shall be an equipment, so it bound for 2 times with supports and supported by roles. However at the right side of figure 4, Light sectored shall be an equipment, but it bound for only 1 time. This seems like an S-101 DCEG discrepancy.

4) Binding issue for All Geo Features

23 Cartographic Features							
23.1 Text placement							
Feature/Information associations							
Type	Association Name	Association Ends					
		Class	Role	Mult	Class	Role	Mult
Asso	Text Association	Text Placement	Identifies	0,1	All Geo Features	Positions	1,1

Figure 5 Text placement(Information type)

The current S-101 DCEG defines all geo features shall have information type such as Text placement. However there is no bound information about Text placement at the whole geo-features such as Vessel traffic service area.

22.2 Vessel traffic service area							
Feature/Information associations							
Type	Association Name	Association Ends					
		Class	Role	Mult	Class	Role	Mult
Asso	Additional Information	Vessel Traffic Service Area	Information provided for	1,*	Contact Details	Provides information	0,1

Figure 6 Vessel traffic service area(feature type)

In this case, it is necessary to discuss whether to bind the text placement to all geo-features or to bind only the features that has the text placement in the feature page. Because the Nautical information also defined as all geo features following figure 7, but only caution area has Nautical information as an information type following figure 8.

24.4 Nautical information

Feature/Information associations							
Type	Association Name	Association Ends					
		Class	Role	Mult	Class	Role	Mult
Asso	Additional Information	Nautical Information	Provides information	0,1	All Geo Features	Information provided for	1,*

Figure 7 Nautical information(Information type)

16.10 Caution area

Feature/Information associations							
Type	Association Name	Association Ends					
		Class	Role	Mult	Class	Role	Mult
Asso	Additional Information	Caution Area	Information provided for	1,*	Nautical Information	Provides information	0,1
Asso	Caution Area Association	Caution Area	Consists of	1,*	Archipelagic Sea Lane, Traffic Separation Scheme	Component of	0,1
Aggr	Fairway Auxiliary	Caution Area	Has auxiliary	1,*	Fairway	Auxiliary to	0,1

Figure 8 Caution area(feature type)

5) Defines of Spatial type

S-101 DCEG defines what is the Spatial type, but it doesn't define which features are Spatial type. As with Geo features, Spatial type should clearly classify their features so that it is possible to bind spatial types when producing S-101 FC

Conclusions

The S-101 FC 1.0.0 official version has been released in accordance with the final S-101 DCEG 1.0.0 document revised since the last S-100WG4 meeting and TSM6 meeting. KHOA request to discuss the problems which was found during S-101 FC creation process and issues that need to be improved of S-101 DCEG document.

Recommendations

Request S-101PT4 attendees to review issues identified during S-101 FC creation.

Action Required of S-101PT

The S-101PT4 is invited to:

- a. Note this paper
- b. Discuss the S-101 FC issues reported by this paper
- c. Request to update the S-101FC accordingly