Paper for Consideration by TSMAD and DIPWG

Feature and Portrayal Catalogue Management in S-101

Submitted by:	S-101 Work Item Leader
Executive Summary:	One of the key components of S-101 is the utilization of Feature and Portrayal Catalogues. In preparing the initial final draft of S-101, one of the gaps that was noted was that there was no guidance on the management of FC and PCs for the ECDIS
Related Documents:	S-101 Product Specification (Implementation Guidance)
Related Projects:	S-101 and possibly other specifications that use S-100

Introduction / Background

One of the new concepts that are introduced in S-101 are machine readable feature and portrayal catalogues which can be easily updated and released for use on and ECDIS.

The Feature Catalogue contains the bindings for the features, attributes, and enumerates. It also includes defines if the feature can be a point, line, area, or a combination of all three.

The Portrayal Catalogue contains the rules and symbols for portraying the feature and attribute combinations in the feature catalogue.

After TSMAD25 a new version of S-101 was prepared incorporating all the decisions made at that meeting. During a review it was noted that there was a distinct lack of guidance on how the updating process of feature and portrayal catalogues were to behave on the ECDIS. There is documentation regarding version control of the product specification and what would trigger a new minor/major edition of the product specification – which may or may not include changes to the feature and portrayal catalogues. This only takes care of the release of the next edition, however, it does not account for how systems should handle the intake of these different versions of the product specification (which may have an updated feature and portrayal catalogue) and that in reality at any given point there will be ENC data that is built on two or more editions of the product specification.

This paper seeks to outline the potential scenario that may happen and provide tow options for discussion and potential inclusion into S-101.

Analysis/Discussion

As S-101 is under version control, if a new feature is accepted it will trigger a new version of the product specification, the same if a new portrayal is accepted, or a combination of both. However, that leads to the issue of how will ECDIS control the display of data that is created on different versions of the product specification and will the IHO need to sunset out older versions of products based on earlier versions of the product specification.

The following table shows a potential scenario:

S-101 Product Specification version	FC/PC Version	[1]OEM action	Reason for version change	ENC dataset version
1.0.0	1.0.0	Y	Initial Draft	1.0.0
1.0.1	1.0.1	N	Clarification to a definition	1.0.0
1.1.0	1.1.0	N	Correction to a definition	1.0.0
1.2.0		Y	Correction to portrayal	1.0.0 1.2.0
1.3.0		N	Correction to DCEG	1.0.0 1.2.0 1.3.0
2.0.0		Y	New feature added, new portrayal added	1.0.0 1.2.0 1.3.0 2.0.0

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[1] OEM action means that either the ECDIS or software and validation manufactures will have to take action and implement the changes

At any given point in time there may be different datasets available that are tied to different versions of the product specification. The main reason is that some hydrographic offices may not need to move to that version of the product specification as the changes do not affect their area of responsibility. The most likely scenario is that at any given time all HO's will be in a mixed state of product specifications. For example, once a new product specification is introduced the HO will move all new edition publications to that version; however, older data that does not need a new edition will remain on the previous version.

As this mixed state will be a reality, S-101 must provide some implementation guidance for the ECDIS on how to treat this issue.

OPTION 1: ECDIS manages multiple feature and portrayal catalogs in order to correctly portrayal data that was created on different versions of the product specification. The metadata associated with each dataset notates which product specification it is tied to.

The IHO should also specify a sunset clause for different editions of product specifications. For example, the IHO will put in place a transition period for hydrographic offices to move from one version of the product specification to the next.

In addition, there will have to be specific guidance that states OEMs must be able to read valid versions of the product specification feature and portrayal catalogues and ensure that data that is associated with that version must be properly displayed.

OPTION 2: For each new edition of the product specification, a cumulative feature and portrayal catalog is released. Therefore the ECDIS will only have to manage a single feature catalog and portrayal catalog.

In order for Option 2 to be feasible there will have to be some rules outlined. In order to develop the proper rules a few scenarios are outlined.

At this point we will only focus on Feature Catalogues, although the principles should be the same for portrayal catalogues.

- A key principle is each version a feature catalogue is tied to the version of the product specification.

- A single feature catalogue must be backwards compatible with existing data. Older FC data must load when a newer FC is in use.

- Data can only be issued conforming to the new catalogue when that catalogue has been published.

- Data must not load if it conforms to a FC not held by the system.

There are at least three scenarios that will trigger a change to a feature catalogue where specific rules must be laid out.

Scenario	Data exists	OK?	PS Ver	FC Ver
Add new item	-	Y	1.1.0	1.1
Change item	N	Y	1.1.0	1.1
Change item	Y	Y (add)	1.1.0	1.1
Remove item	N	Y	1.1.0	1.1
Remove item	Y	N (sunset)	-	-

Scenario 1 – Additions to the Feature Catalogue

Over time, there will be additions to the feature catalogue. There can be additions of **attributes**, **attribute values** or **features**. Once the new additions have been approved the Product Specification and accompanying Feature Catalogue must uptick accordingly. Existing data must not already contain these values and in order to reflect their inclusion data has to be edited.   Historically most issues can be addressed with an addition.

Additions Example – The addition of a new Topmark Feature

1. A new Topmark is proposed to TSMAD
2. TSMAD agree the addition and it's submitted to the registry and added to a revised Feature Catalogue.
3. The feature catalogue is tested by producers and ECDIS manufacturers.
4. The catalogue is published and made available. (Along with an uptick in the Product Specification)
5. Producers begin to encode the new values.
6. In systems which do not have the latest catalogue datasets conforming to it will not load data conforming to the new catalogue.
7. Data conforming to older catalogues still loads.

Scenario 2 – Changes to the Feature Catalogue

A change can be a complex attribute replacing a simple attribute or the removal of a feature, attribute or feature attribute. The following rules must apply;

1) Changes where data is currently encoded in this way must be additions for example a complex attribute in addition to an existing simple attribute. Existing data can then be deprecated (sunset).

2) Removals must only be made when no ENC data contains these values. TSMAD will manage deprecation of items through the DCEG.

Change Example - A new complex is created for light sectors

1. A proposal is made to create a complex for light sectors, thus replacing SECTR1 and SECTR2
2. TSMAD agree the addition and it's submitted to the registry and added to a revised Feature Catalogue.
3. The feature catalogue is tested by producers and ECDIS manufacturers.
4. The catalogue is published and made available. (Along with an uptick in the Product Specification)
5. Producers begin to encode the new values.
6. In systems which do not have the latest catalogue datasets conforming to it will not load data conforming to the new catalogue.
7. Data conforming to older catalogues still loads

Removal Example – Values are removed from the feature catalogue

1. As a result of the creation of a complex attribute the attribute values SECTR1 and SECTR2 are removed from the feature catalogue.
2. TSMAD agree the removal and it's submitted to the registry and removed from a revised Feature Catalogue.
3. The feature catalogue is tested by producers and ECDIS manufacturers.
4. The catalogue is published and made available. (Along with an uptick in the Product Specification)
5. Producers begin to encode the new values.
6. In systems which do not have the latest catalogue datasets conforming to it will not load data conforming to the new catalogue.
7. Data conforming to older catalogues still loads

Recommendations
TSMAD and DIPWG should discuss the two proposed options and decide on a way forward. Once a decision is made a small sub working group will flesh out the language for inclusion in the S-101 product specification's implementation guidance. In addition, test cases will be written against the proposed approach and used in the test bed.

Justification and Impacts
It is essential that TSMAD and DIPWG select an option for Feature and Portrayal catalogue management. It should be recognized that this option may be amended as testing progresses.

Action Required of [HSSC] [Relevant HSSC WG]

The TSMAD/DIPWG is invited to:

      a.   discuss the proposed options for FC/PC management

      b.   decide which option should be included in S-101 and subsequently tested