S-164/S-98 items related to TSM topics.

Selected topics

1. Official/Unofficial
2. Versioning revisited
3. Dual Fuel “Data Loading” (view of the ECDIS) and “Equivalence”
4. Part 10b
5. S-104 datasets
6. ISO8211
7. Multiple Languages (and other products?)

8. **Then, S-164 Update…**
9. **Then S-98 Update…**

Official/Unofficial

Current words in S-98 Annex C

The official status of data delivered to the ECDIS is defined by the value of a role. This is encoded in the ST field of the X.509 certificate referenced in the mandatory digitial signature accompanying content in the exchange set catalogue. Digital signatures are mandatory for any data imported into the ECDIS, whether official or not. The mandatory fields within every authenticating certificate are defined as:

- **C** (Country) = ISO Country Code of state making request
- **ST** (State or Province) = A code reflecting the role of the signing entity (below)
- **O** (Organisation) = member state organisation name (text) or other organisation name
- **CN** (Common Name) = IHO data producer code integer and alpha code (as part of a colon separated MRN), e.g. **urn:mrn:iho:aa:181**0 or **urn:mrn:iho:GB:540**. For datasets the CN data producer integer and alpha code must match those contained in the corresponding dataset and its CATALOG.XML entry.

For ECDIS, the ST code holding the role determines whether a dataset or supporting resources is unofficial or official. The following codes are supported by the IHO data protection scheme:

- For S-100 datasets or supporting resources the following roles define official data.
    - **DATA_PRODUCER** Data Producers - producing data content for live navigation under SOLAS. This data is "official"
    - **DATA_AGGREGATOR** RENCs/Aggregators - validate, distribute and (sometimes) digitally sign data on behalf of their members. These organisations do not create data content but can sign data as “official”
- S-128 datasets used for ECDIS Update Status reports. These datasets may also be authenticated by:
    - **AGGREGATOR** S-128 producers – aggregate data together for the purposes of running a service for end users. They can only digitally sign S-128 datasets which support exchange sets and the production of update status reports.
- Catalogues
    - **SCHEME_ADMINISTRATOR** The Scheme Administrator, the IHO. Only digitally signed catalogues with a certificate authenticated by the scheme administrator may be loaded onto the ECDIS.

ST field values using the role **OTHER_DATA_PRODUCER** (or any other value, or those not conforming to the CN MRN format above) represent data or catalogue content which is "unofficial".

IMO Guidelines (SN.243/Rev.2 and MSC.1609) describe "Mariner's Navigational Features" for route planning and route monitoring chartwork. The descriptions may be in the same format as chart features, in order to avoid the ECDIS having to deal with two differently coded types of data.

Mariners may alter the IMO categories for Mariner's Features (but not for ENC features). Note, however, that IMO MSC.530(106) section 11.4.1 requires that own ship’s position and selected planned route should always appear when the display covers either, and these “features” must

Versioning

- FC:
  - `<S100FC:versionNumber>1.2.2-DRAFT</S100FC:versionNumber>`
  - `<S100FC:versionDate>2024-03-14</S100FC:versionDate>`
  - `<S100FC:productId>S-101</S100FC:productId>`
- PC:
  - `productId="S-101" version="1.2.0-PR">`
- Datasets (ISO8211) have:
  - `<PRSP>INT.IHO.S-101.1.2.0</PRSP>`
  - `<PRED>1.2.0</PRED>`
- CATALOG.XML

```
<S100XC:productSpecification>
  <S100XC:productIdentifier>S-101</S100XC:productIdentifier>
  <S100XC:number>1</S100XC:number>
</S100XC:productSpecification>
```

Right Now…

- For a given dataset (PRSP = INT.IHO.[text].x.y.z), which feature catalogue(s) describe its structure, and which portrayal catalogues may be used with it.

C-21.1 Multiple product versions and portrayal

The ECDIS must be able to carry and use multiple versions of the Feature Catalogue for a product. Catalogue management is based on the version number of the Product Specification and Catalogues. For example, the ECDIS will need to carry all valid Catalogues that are used for datasets that have been produced from an earlier edition of a Product Specification; but may retire a superseded version after the last such dataset has been cancelled.

See Appendix C-2 for loading and ingest processes including SSE Codes relating to Product Specification and Interoperability Catalogues.

IHO Publication S-97 recommends that the versioning of Product Specifications follow the same rules as S-100, which uses a three-part version number (*Edition.Revision.Clarification*). The significance of each component is summarised below.

- Edition: New Editions introduce significant changes, such as the ability to support new functions or applications; or the introduction of new constructs or data types. New Editions are indicated by incrementing the *Edition* component of the version number and resetting the other components to 0.
- Revision: Revisions introduce substantive semantic changes. Changes in a Revision ensure backward compatibility with previous versions within the same Edition. A Revision, for example, may introduce new features and attributes, but will not delete a feature or attribute. New Revisions are indicated by incrementing the *Revision* component of the version number and resetting the *Clarification* component to 0.
- Clarification: Clarifications are non-substantive changes. Typically, Clarifications remove ambiguity; correct grammatical and spelling errors; amend or update cross references; and/or insert improved graphics, spelling, punctuation and grammar. Clarifications must not cause any substantive semantic changes. Changes in a Clarification are minor and ensure backward compatibility with the previous versions within the same Edition. Clarifications are indicated by incrementing the Clarification component of the version number.

TSM View

- Agree/Disagree/Neutral
- Agree/Disagree/Neutral
- Agree/Disagree/Neutral

The consequences for portrayal are:

1) It should be possible to process datasets conforming to an earlier Revision within the same Edition, with the Feature and Portrayal Catalogues for the latest Revision in that Edition.
2) It should be possible to process datasets conforming to an earlier Revision or Clarification within the same Edition with the Feature and Portrayal Catalogues for the latest.
3) A Portrayal Catalogue for a new Clarification can always rely on earlier versions of the Feature Catalogue within the same Edition. (Note that an old Feature Catalogue cannot be relied on for processing the dataset for a newer Revision. That is OldDataset+OldFC+NewPC is processable, but NewDataset+OldFC+NewPC is not.)
4) It should be possible to process datasets conforming to a Clarification with the Feature and Portrayal Catalogues for an earlier Clarification within the same Edition and Revision.
5) The significance of changes to only a Portrayal Catalogue (without a concomitant change to the Product Specification or Feature Catalogue) can be more difficult to classify (as a New Edition, Revision, or Clarification), because in addition to data model semantics, human factors effects for user interfaces and IMO guidance about compatibility, text abbreviations, etc, must also be considered.

   In general, the IHO and/or Type Approval Authority should be consulted to determine the significance of the change. This also applies to Revisions planned by Project Teams.

TSM View

1. Agree/Disagree/Neutral
2. Agree/Disagree/Neutral
3. Agree/Disagree/Neutral
4. Agree/Disagree/Neutral
5. Agree/Disagree/Neutral

Versioning 3 – what should S-164 test?

- **The ECDIS must be able to load >=2 sets of catalogues and allow for simultaneous operation with multiple revisions of products**
- **Must the ECDIS be able to load only products which are in the IHOs list of products by Phase (1 and 2). What about the future?**
- **We have an "arbitrary product loading" test**
- **Related to catalogue loading questions?**

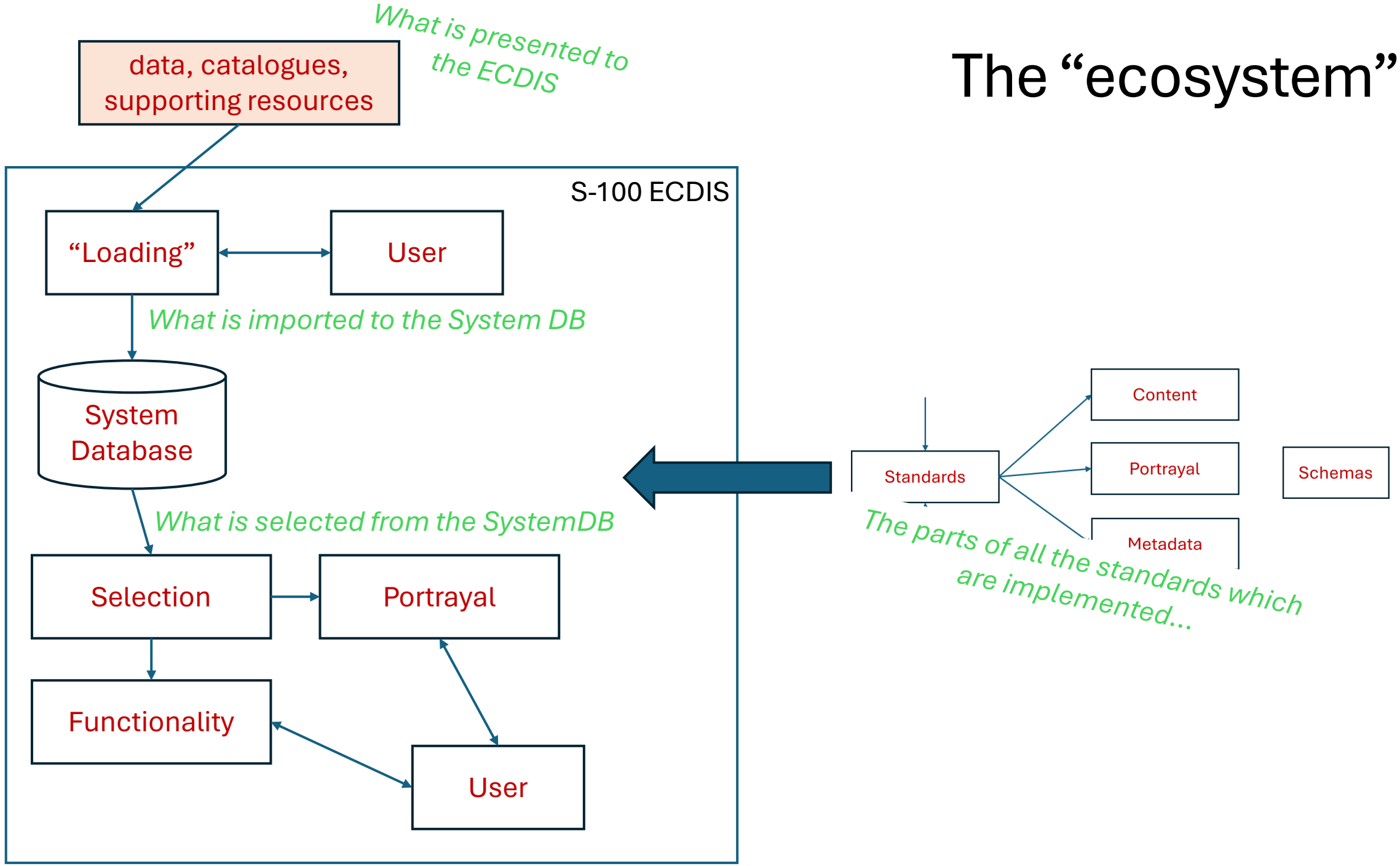
S-98 should be the document to specify which product specifications are mandatory to be handled by ECDIS (phase 1). Therefore this section should be normative and not informative. It has to be amended when the second phase of the IHO Roadmap for the S-100 Implementation Decade comes into force.

It cannot be expected that an S-100 DF-ECDIS type approved by applying S-164 edition 2.0.0 tests and on the market beginning of 2026 will be compliant to all S-100-based data products developed after phase 1.

S-164 in the first implementation phase is rather testing compliance with the product specifications listed for phase 1 than testing compliance with all aspects of S-100. For further data products there will be not yet any test data. So it cannot be guaranteed that the type approved ECDIS is fully compliant to S-100 as a whole.

The expectation is that S-164 will be amended for phase two to include test data for the additional product specifications. This would mean that the type approval has to be repeated each time new product specifications are introduced.

The “ecosystem” I



A focus on dual fuel

- There is precious little testing nor test beds available for dual fuel. So the impact on the user is not known.
- It makes choices on scheming and scales difficult for data producers because they do not know how the S-100 ECDIS will behave when faced with multiple “fuels”.
- The production aspects are just becoming clearer but the user side is still very difficult to define.
- Equivalence between S-101 and S-57 is being specified in S-128. There remain uncertainties about how, and whether, this is required by the rest of the distribution chain and the S-100 ECDIS.

Equivalence

- S-128 has added equivalence to its model. This allows one or more products to be marked as “equivalent” to one or more other named products.
- The S-128 mechanism is required, because producers need to be able to communicate their equivalence with RENCs and distributors
- Equivalence is many-many (and has many complex characteristics)
- Is this equivalence “required” by the ECDIS.
- Is C-18.1 intended to apply to
  - data loading (e.g. from media)
  - or to the selection of data for portrayal and other functionality
- If not, then is it the distributor/data server’s responsibility to ensure “old” versions are deleted from the ECDIS?

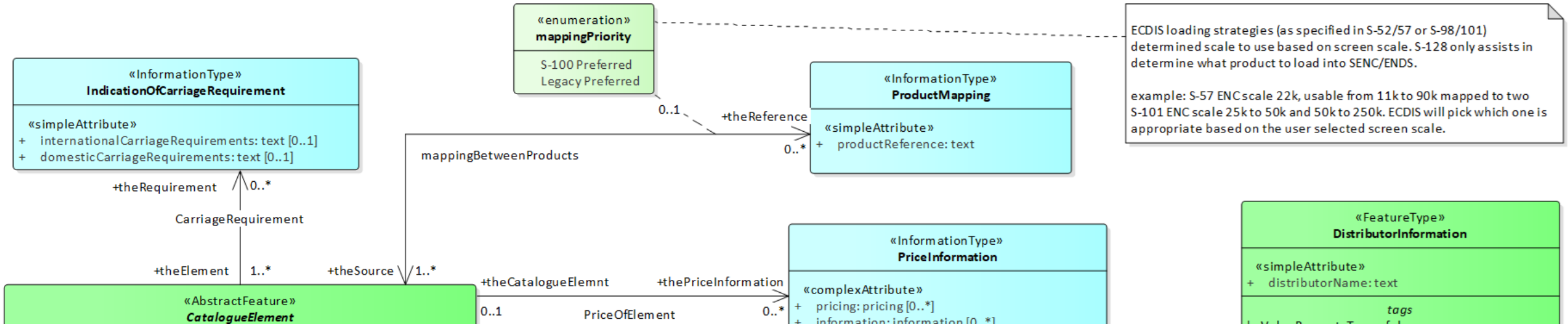
C-18.1 Display of data available in both new and legacy formats

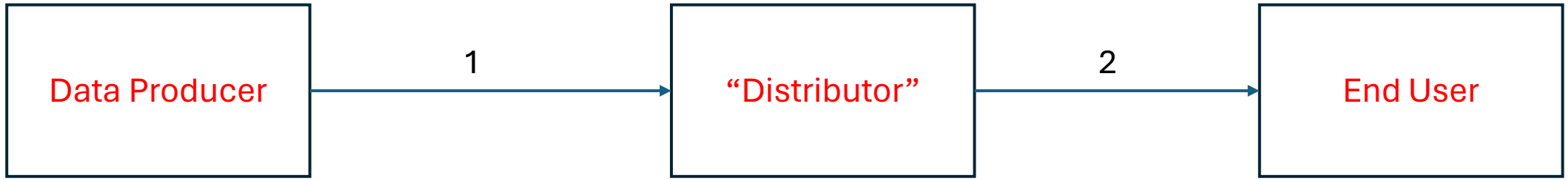
In general, systems should give newer formats priority over the older formats, and utilise data from the older format only when there is no coverage of the new format data at an appropriate scale (that is, when the display scale is out of the scale bounds in dataset metadata).

S-101 ENC data should always be given priority over S-57 ENC data when both S-101 and S-57 ENCs provide data coverage at the Mariner’s set display scale.

The question of handling simultaneous display of data in old and new formats is still to be addressed by the IHO at the time this document is being written. In the interim, systems should:

1) Indicate when the screen is displaying older-format data.
2) Indicate the boundary between new and old-format datasets if both new and old formats are being simultaneously displayed (one part of the screen is displaying new-format data and another old-format data).
3) Anticipate that the portrayal of newer formats aligns with the portrayal of the older formats during the transition period, so that dual-fuel capable systems will not show significant differences in portrayal of what is essentially the same data in different formats or between different regions where S-100 adoptions are occurring at different paces.


«enumeration»
mappingPriority
S-100 Preferred
Legacy Preferred
ECDIS loading strategies (as specified in S-52/57 or S-98/101) determined scale to use based on screen scale. S-128 only assists in determine what product to load into SENC/ENDS.
example: S-57 ENC scale 22k, usable from 11k to 90k mapped to two S-101 ENC scale 25k to 50k and 50k to 250k. ECDIS will pick which one is appropriate based on the user selected screen scale.
«InformationType»
IndicationOfCarriageRequirement
«simpleAttribute»
+ internationalCarriageRequirements: text [0..1]
+ domesticCarriageRequirements: text [0..1]
«InformationType»
ProductMapping
«simpleAttribute»
+ productReference: text
0..1
+theReference
0..*
mappingBetweenProducts
+theRequirement
0..*
CarriageRequirement
«FeatureType»
DistributorInformation
«simpleAttribute»
+ distributorName: text
tags
«InformationType»
PriceInformation
«complexAttribute»
+ pricing: pricing [0..*]
+theElement
1..*
+theSource
1..*
+theCatalogueElemnt
+thePriceInformation
0..1
PriceOfElement
0..*
«AbstractFeature»
CatalogueElement


Data Producer
1
“Distributor”
2
End User

Part 10b / GML Implementation.

- S-100 Edition 4.0.0 contained examples of GML Profile
  - How to create Schemas
  - Example datasets
- S-100 Edition 5.0.0 rewrote Part 10b from scratch
  - Schemas are definable from the feature catalogue contents. They can further restrict the feature catalogue but shouldn't deviate from it
  - Much of Part 10b is still untested. Few implementations exist and while some interoperability testing has been done there are few conclusions.
  - **How can we make things more resilient?**
- Options:
  - Do Nothing ☹
  - Insert examples into Appendix 10b-B (still there, empty)
  - Develop guidance for inclusion in edition 6, keep in S-98 Annex C for now…
  - Get consensus from implementers before publishing GML Schemas for Phase 1 products (S-128, S-124, S-129)

Appendix 10b-B
Use of Profile in GML Application Dataset
(informative)

10b-B-1. Introduction

This clause illustrates the use of the GML profile (10b-8) and base schema (10b-9) and a GML application schema (App. 10b-A) for an S-100-based data product and a GML dataset.

10b-B-2. Dataset structure in GML application schema

An example of the format of a GML dataset is shown in the figure below. This dataset defines data objects as information objects, spatial objects. or feature objects. It specifies the sequence of objects in the file as information objects first, followed by spatial objects, then features.

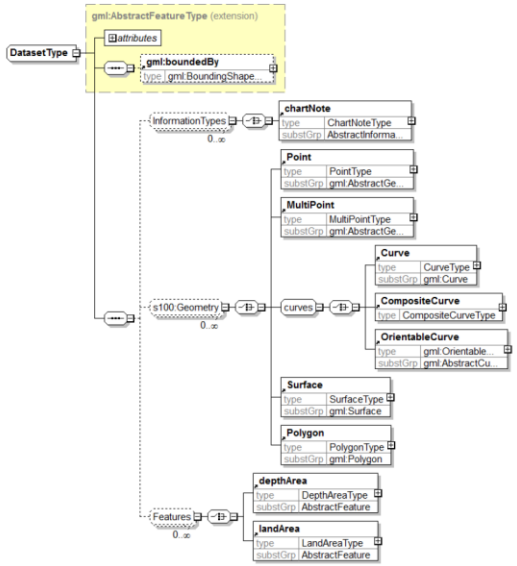


Figure 10b-B-1 – Example of dataset definition in GML application schema

10b-B-3. Dataset examples in XML/GML

The figure below shows a partial example dataset. Content in *italics* has been omitted for brevity.

```
<Dataset (... namespaces and schemaLocation ...) gml:id="ds">

 <gml:boundedBy>
  <gml:Envelope srsName="http://www.opengis.net/def/crs/EPSG/0/4326">
```

?

TM

Thomas Mellor

To: Julia Powell <Julia.Powell@noaa.gov>; **+2 others**

Tue 12/03/2024 15:39

Cc: Christian Mouden <christian.mouden@shom.fr>

Afternoon Guys

Hope TSM is going well, I had a call with Shom today with focus on tidal products. Shom are planning on issuing S-104 based on astronomical predictions and UKHO are investigating the possibility of issuing both predicted and forecast S-104. This got us thinking about how the ECDIS would prioritise the use of the data if both products were present in the ECDIS simultaneously. Not sure if this has already been considered but we wanted to raise this for possible discussion this week if you have time.

Best regards,
Tom

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UK Hydrographic Office

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Water level data are categorised as follows, based on the data source:

1. Observed, predicted, or forecasted values at a number of stationary locations;
2. Computed values (for example hindcast or forecast data from hydrodynamic models) arranged in a regular grid; and
3. Values at multiple locations but not in a regular grid.

Multiple Languages (for all products)

a

```
{
    nameUsage=1
    name=Rathlin
    language=eng
}
{
    nameUsage=2
    name=Reachlainn
    language=gle
}
{
    nameUsage=2
    name=Racherie
    language=gla
}
```

b

```
{
    nameUsage=1
    name=Sanda
    language=eng
}
{
    nameUsage=2
    name=Sandaigh
    language=gla
}
```

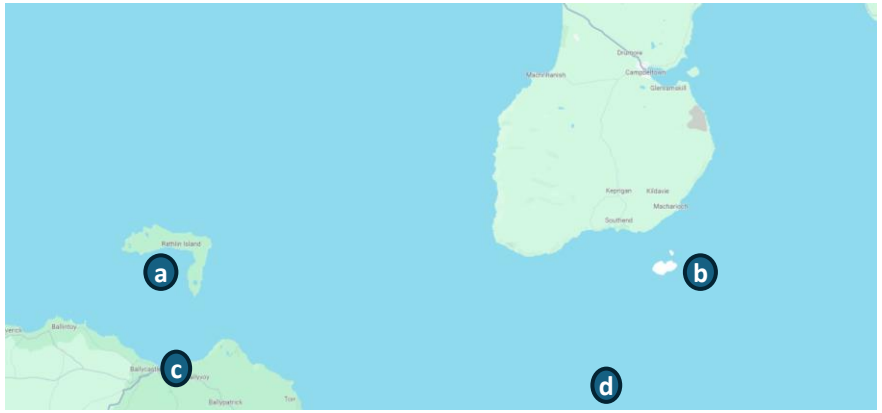
c

```
{
    nameUsage=1
    name=Baile an Chaistil
    language=gle
}
```

d

```
{
    nameUsage=1
    name=Môr Manaw
    language=cym
}
{
    nameUsage=2
    name=Irish Sea
    language=eng
}
```

gle=Irish Gaelic, **gla**=Scots Gaelic, **cym**=Welsh, **eng**=English



[gle,gla,eng]	Reachlainn	Sandaigh	Baile an Chaistil	Irish Sea
[eng,gla]	Rathlin	Sanda	Baile an Chaistil	Irish Sea
[gle,gla]	Reachlainn	Sandaigh	Baile an Chaistil	Môr Manaw
[gla,gle]	Racherie	Sandaigh	Baile an Chaistil	Môr Manaw
[gle]	Reachlainn	Sanda	Baile an Chaistil	Môr Manaw
[]	Rathlin	Sanda	Baile an Chaistil	Môr Manaw
	a	b	c	d

a

```
{
   nameUsage=1
   name=Rathlin
   language=eng
}
{
   nameUsage=2
   name=Reachlainn
   language=gle
}
{
   nameUsage=2
   name=Racherie
   language=gla
}
```

b

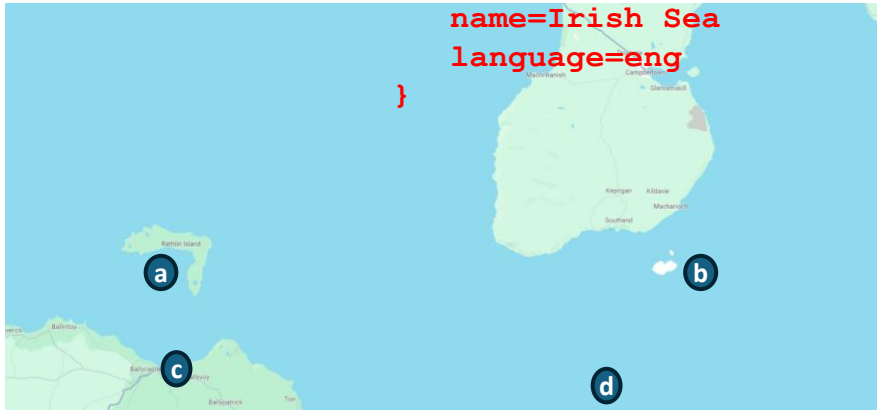
```
{
   nameUsage=1
   name=Sanda
   language=eng
}
{
   nameUsage=2
   name=Sandaigh
   language=gla
}
```

c

```
{
   nameUsage=1
   name=Baile an Chaistil
   language=gle
}
```

d

```
{
   nameUsage=1
   name=Môr Manaw
   language=cym
}
{
   nameUsage=2
   name=Irish Sea
   language=eng
}
```



gle=Irish Gaelic, **gla**=Scots Gaelic, **cym**=Welsh, **eng**=English

Part 10a – ISO8211 encoding

- We have not created “exhaustive” test data for Part 10a (Yet)
- Some ambiguities have tripped up implementers already
- Others may exist
- Updating particularly is untested by all providers
- Although it doesn’t require specific tests we should aim to put as many different combinations into Part 10a
  - Examples of all different types of geometry and feature / attribution updating
  - Different kinds of geometry
  - Multiplicities and fields which may vary on ECDIS (curves, surfaces etc)
  - Which parts must be “fixed” in ECDIS, e.g. WGS84?

Composite Curves. The two ways of encoding.

```
<RECORD>
 <CCID>
  <RCNM>125</RCNM>
  <RCID>20</RCID>
  <RVER>1</RVER>
  <RUIN>1</RUIN>
 </CCID>
 <CUCO>
  <RRNM>120</RRNM>
  <RRID>1</RRID>
  <ORNT>2</ORNT>
 </CUCO>
 <CUCO>
  <RRNM>120</RRNM>
  <RRID>2</RRID>
  <ORNT>2</ORNT>
 </CUCO>
 <CUCO>
  <RRNM>120</RRNM>
  <RRID>3</RRID>
  <ORNT>2</ORNT>
 </CUCO>
 <CUCO>
  <RRNM>120</RRNM>
  <RRID>4</RRID>
  <ORNT>2</ORNT>
 </CUCO>
</RECORD>
```

```
<RECORD>
 <CCID>
  <RCNM>125</RCNM>
  <RCID>98</RCID>
  <RVER>1</RVER>
  <RUIN>1</RUIN>
 </CCID>
 <CUCO>
  <RRNM>120</RRNM>
  <RRID>356</RRID>
  <ORNT>1</ORNT>
  <RRNM>120</RRNM>
  <RRID>357</RRID>
  <ORNT>1</ORNT>
  <RRNM>120</RRNM>
  <RRID>236</RRID>
  <ORNT>1</ORNT>
  <RRNM>120</RRNM>
  <RRID>358</RRID>
  <ORNT>1</ORNT>
  <RRNM>120</RRNM>
  <RRID>359</RRID>
  <ORNT>1</ORNT>
  <RRNM>120</RRNM>
  <RRID>108</RRID>
  <ORNT>1</ORNT>
 </CUCO>
</RECORD>
```

10a-5.8.2 Composite Curve record structure

```
Composite Curve record
   |
   |--CCID (4): Composite Curve Record Identifier field
      |
      |-<0..*>-INAS (5\\*5): Information Association field
      |
      |-<0..1>-CCOC (3): Curve Component Control field
      |
      |-<0..*>-CUCO (*3): Curve Component field
```

Data Descriptive Field

```
1100;&□□□Curve□Component□Control▲CCUI!CCIX!NCCO▲(b11,2b12)▼
```

10a-5.8.2.3 Curve Component field structure

Field Tag: **CUCO**	Field Name: Curve Component

Subfield name	Label	Format	Subfield content and specification
Referenced Record name	*RRNM	b11	Record name of the referenced record
Referenced Record identifier	RRID	b14	Record identifier of the referenced record
Orientation	ORNT	b11	{1} - Forward {2} - Reverse

S-164

S-164 Items

- This is a workshop, no papers to ask for changes to S-100. There may be impacts into S-98 Annex C and inputs are required for S-164, e.g.
  - Missing tests
  - Different outcomes
  - Things we haven't considered
  - Undefined product specific functionality.
- Also cover S-164 Status
- Plan Update
  - Interaction/Dependencies with other product specifications
  - How to process changes
- The Main challenges
- Big Gaps/Issues
- Some specific areas which we need input on.

Plan Items

- S-164 Status (detail)
  - S-101
    - **Generally ok, but not supporting S-101 v1.2 yet. Close but exchange sets remain to be made. Support for PC development has taken priority**
    - **But, methodology for creating such datasets is now finalized**
    - **Automated exchange set creation is now working and has been migrated to 5.2.0 digital signatures**
    - **We need to extend this to a more detailed plan for operational 2.0.0 stage**
  - Other Phase 1 products
    - **Little progress on operational, or near-operational FC and schemas**
    - **Makes it difficult to prepare meaningful test data samples, also S-101 has taken priority**
    - **Likely to change significantly in coming weeks.**
    - **Ambiguities over GML is also a concern**
    - **Any doubts on WLA/USSC and other functions will add risk**
    - **Migration issues will also be a problem for other products.**

Plan Items

- S-164 Status (detail)
  - Goal is to build methods for quickly adding other Phase 1 products to S-164
  - Need to know if tests are “complete” and consistent.
  - **Plan is not resilient and does not promote efficient testing.**
    - We have nothing formally coordinated between the groups, and no contingency when things go wrong.
    - From observation, the most common problems are likely to be:
      - incorrect/inconsistent feature catalogues
      - undeveloped portrayal catalogues
      - Schemas which don’t match feature catalogues
      - lack of test data
      - lack of tools to support data creation.

S-164 Big Issues

- No Interoperability Mode
- No Dual Fuel Mode
- No Water Level Adjustment or User Selected Safety Contour
- Immature “other” product Specs
  - **S-128**
  - **S-124**
  - **S-129**
  - **S-102 / S-104 / S-111**

  (when can we expect these FC/PC? To a known standard)
- There is a time lag to integrate other product specifications into exchange sets and tests.
- Haven’t got tests for data lifecycle defined yet.
- Concern we have missed areas of functionality which require testing.
- Are “we” (IHO community) ready to support S-100 for operational use by stakeholders, Data Producers, Distribution Chain, ECDIS OEMs, Regulators and End Users.
- Also concerned we are not prescriptive enough about which parts of S-100 are required for ECDIS.

Reminders, Layout S-164 (and status)

- Part 1 - Intro
- Part 2 – Chart Loading and Updating
- Part 3 – Chart Display
- Part 4 – Chart Related Functions
- Part 5-7 Detection and Notification of Hazards, Special Conditions, Safety Contour
- Part 8 – S-57 ENC
- Part 9 – Dual Fuel Mode
  - Chart Loading
  - Chart Display
  - Detection and Notification of Hazards, Special Conditions, Safety Contour

Data and The Forward Plan

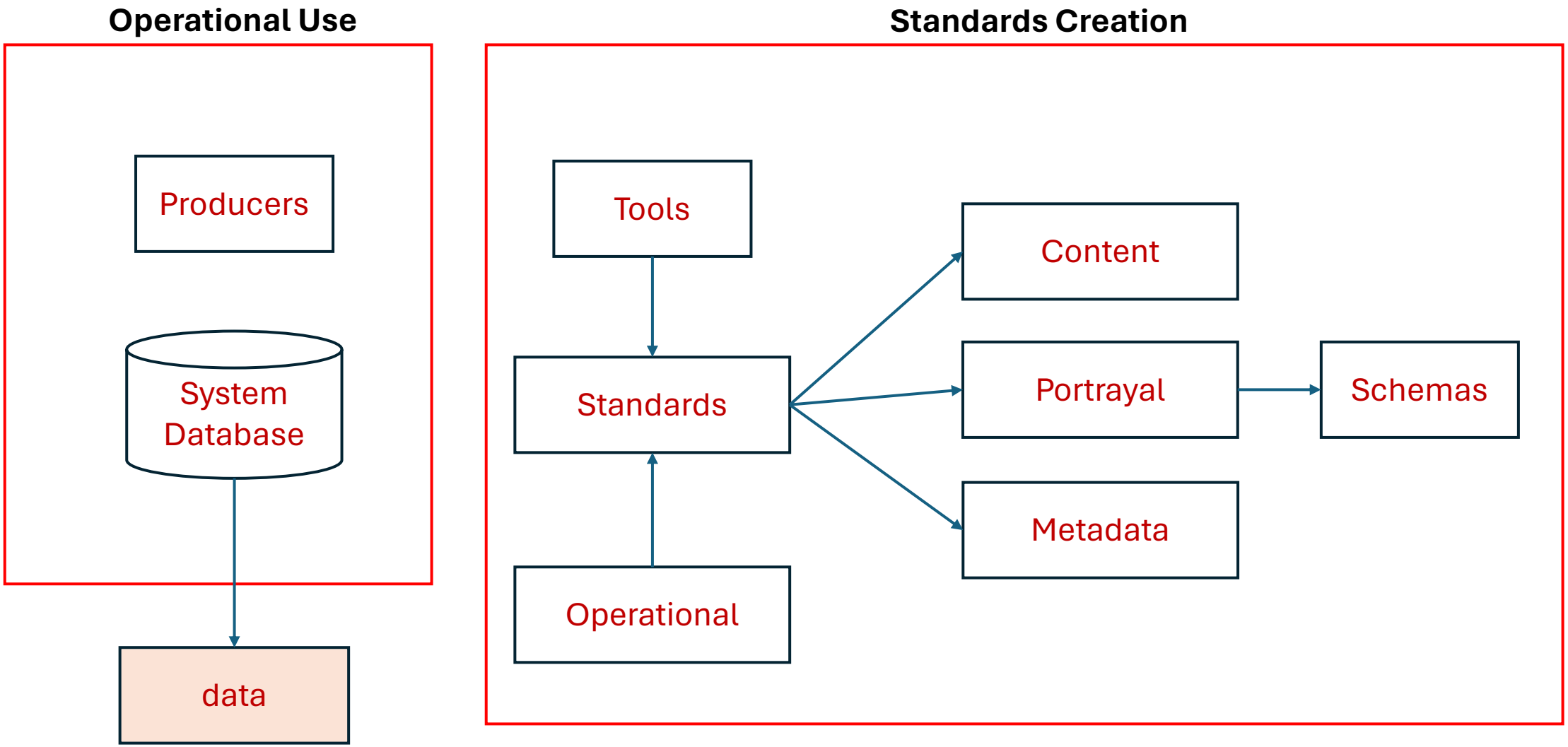
- How to migrate from 1.2 to 2.0 for ENC
- Availability of other phase 1 products?
- Integration of S-102 and other gridded products with the S-101 elements of S-164. How can we speed that up?
- How can we publish an S-164 when there are no test beds which have all the functionality?

- Process for completion, and the resilience of that process is a major barrier. What do we do when something goes wrong?

A resilient test review by S-100 Part

- To find issues which are lurking, we probably need to do the following:
  - For each Part of S-100, make sure we have adequate tests for functionality required on ECDIS
- For each existing S-64 dataset, divide them into
  - **“the content matters”** – the content is designed to be exhaustive, or to test specific cases (e.g areas with special conditions, text display etc…)
  - **“the content is not so important”** – where data content isn’t crucial, where datasets are not designed to be exhaustive in any way.
- For the “content matters” datasets, double check the content is still “correct” – particularly for parts 5,6 and 7

The “ecosystem” II



Part 2 tests – details (for data lifecycle).

- Unencrypted Data
  - Load Catalogues
  - Load Data
  - Updates
- Testing Encryption and Authentication
  - Loading Permits, including multiple service providers
  - Root Certificates
  - Authentication
  - Multiple data servers
  - Permit Expiry
  - Cancel and replacement
  - Reissues
  - Support Files
  - Update Status Report (ENC and ENP)
- **What else is required, and what needs fixing, for testing data lifecycles?**

Focus on Part 2 – what is dataset lifecycle?

- Data Lifecycle
  - Install
  - Update
  - Supplementary files
  - Cancel/Replace (both types)
  - S-128
  - Reissues
  - Tests in S-164 for every aspect
  - Roles and Responsibilities (official/unofficial) including aggregators
- Part 15
  - Multiple Service providers
  - Same data, multiple providers
  - Dual Fuel Selection
  - Use of Intermediary data servers – and non S-1XX products. (particularly +SECOM)

How the model works…

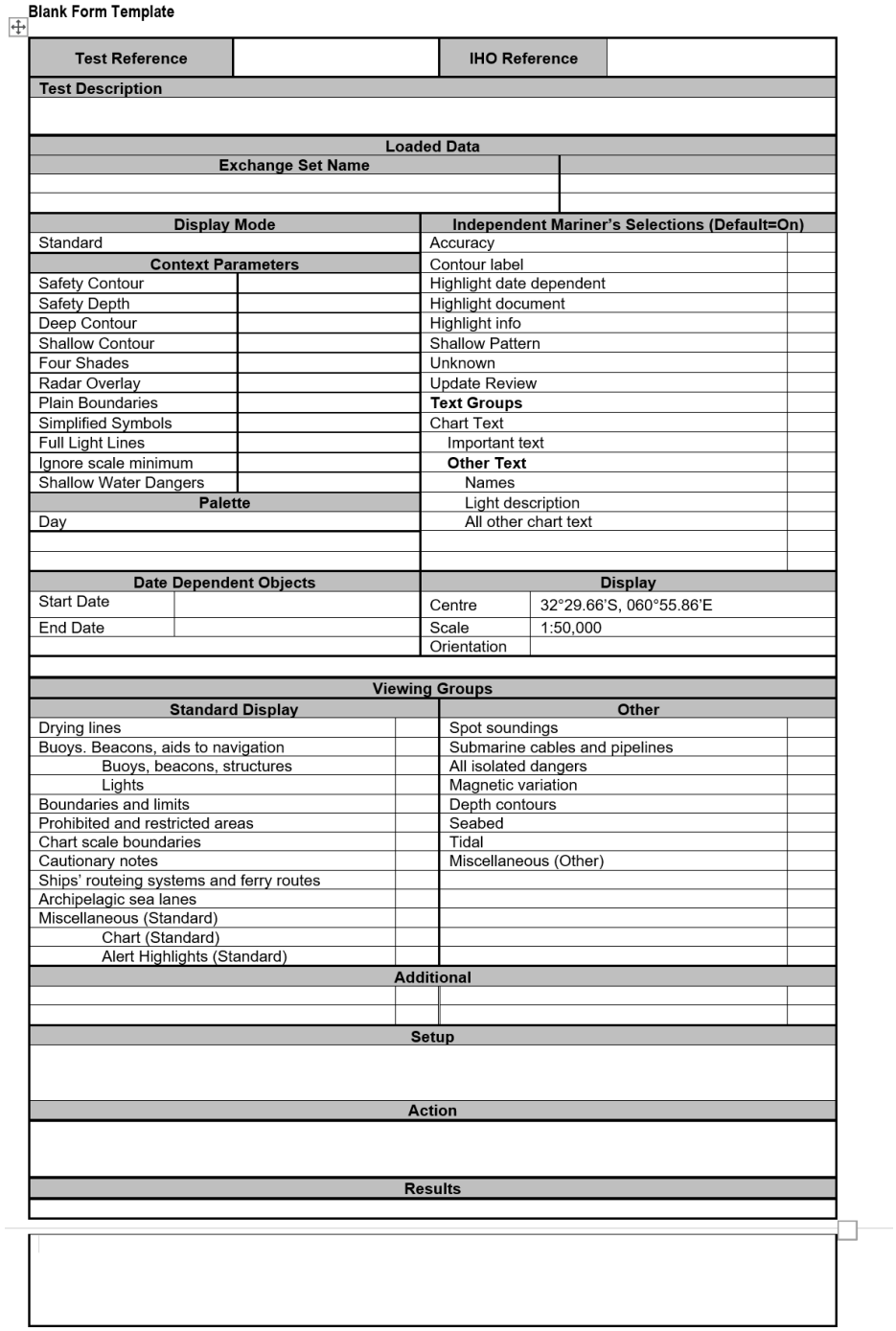
- CATALOG.XML contains
  - List of all resources and their physical location on media
  - A mapping from each supporting resource to the datasets which references them.
- Datasets contain
  - References to supporting resources.
- So, validation can be done between an unencrypted dataset and the support files which are delivered in the exchange set.
- This supports sharing by data providers, and data service providers
- Updates can be done to cells, and support files
  - Update, delete, cancel, modify, new etc etc…
- Does this lead to inconsistencies either in a data service provider or on an ECDIS?

Examples – dependencies on other products

- S-101
  - Display scales / loading strategy
  - Update Information
  - Text Placement
- S-128
  - Update Status report testing and scenarios
  - GML updates
- S-124
  - ECDIS specific functionality yet to be implemented

Test Template for S-164

- This is what it looks like
- Does it need further work?
- The new and improved v2.0.0 of S-164 will use this form exclusively.
- Here's a sample of some tests…



Blank Form Template

Test Reference		IHO Reference	

Test Description

Loaded Data

Exchange Set Name	

Display Mode	Independent Mariner's Selections (Default=On)	
Standard	Accuracy	
Context Parameters	Contour label	
Safety Contour	Highlight date dependent	
Safety Depth	Highlight document	
Deep Contour	Highlight info	
Shallow Contour	Shallow Pattern	
Four Shades	Unknown	
Radar Overlay	Update Review	
Plain Boundaries	**Text Groups**	
Simplified Symbols	Chart Text	
Full Light Lines	Important text	
Ignore scale minimum	**Other Text**	
Shallow Water Dangers	Names	
Palette	Light description	
Day	All other chart text	

Date Dependent Objects		Display	
Start Date		Centre	32°29.66'S, 060°55.86'E
End Date		Scale	1:50,000
		Orientation	

Viewing Groups

Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			

Additional

Setup

Action

Results

Examples – Part 3 Chart Display.

Test Reference	DisplayStandard	IHO Reference	S-98 C-9.5.3

Test Description

The purpose of the test is to verify by observation that ECDIS correctly displays all S-101 ENC features included in the IMO Standard Display category. The test is performed by loading to ECDIS a test S-101 dataset and checking the display against graphical plots.

The test ENC dataset 10100AA_STNDR.000 contains depth and land areas from Display Base plus all S-101 ENC features belonging to Standard Display according to the S-101 Portrayal Catalogue. The features belonging to Standard Display are to be shown if Standard Display is selected in ECDIS HMI and should disappear in the Display Base mode.

Loaded Data

Exchange Set Name	
DisplayStandard	

Display Mode	
Standard	

Context Parameters	
Four Shades	Off
Full Light Lines	Off
Ignore Scale minimum	Off
Plain Boundaries	On
Radar Overlay	Off
Shallow Contour	-
Shallow Water Dangers	On
Simplified Symbols	On
Safety Contour	10m
Safety Depth	10m
Deep Contour	-

Palette
Day

Independent Mariner's Selections (default=On)	
Accuracy	
Contour label	
Highlight date dependent	
Highlight document	
Highlight info	
Shallow Pattern	Off
Unknown	
Update Review	
Text Groups	
Chart Text	Off
Important text	Off
Other Text	Off
Names	Off
Light description	Off
All other chart text	Off

Date Dependent Objects	
Start Date	
End Date	

Initial Display	
Centre	10.09180N 010.0899E
Scale	1:70,000
Orientation	

Viewing Groups

Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			

Additional

Setup

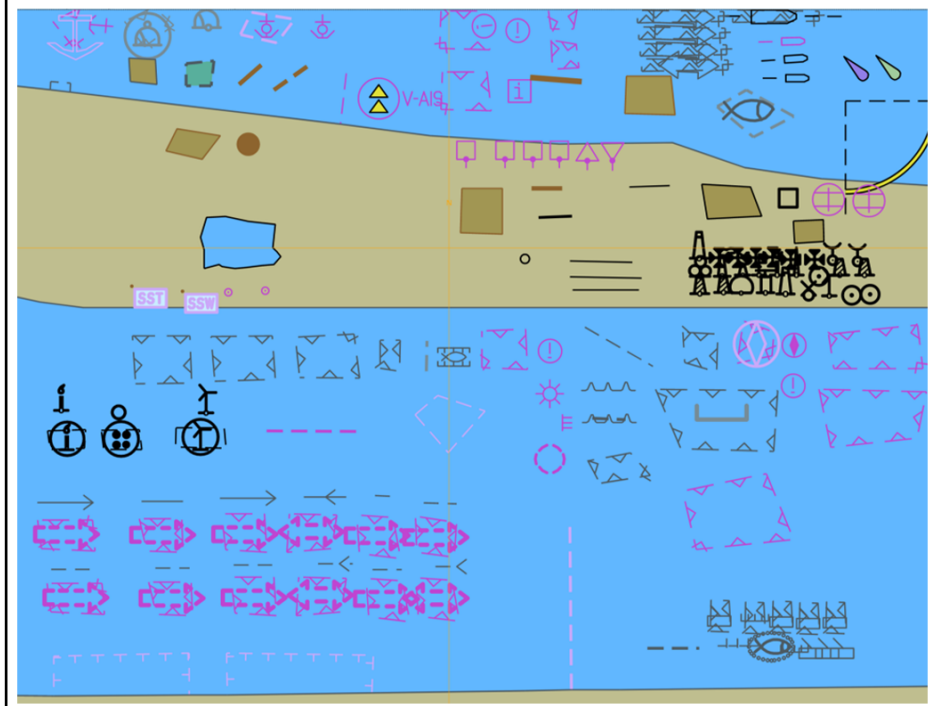
*Load the exchange set **DisplayStandard** (10100AA_STNDR.000) with the settings provided.*

Action

Check ENC symbols shown in ECDIS against graphical plot

Results

- *Confirm that depth and land areas from Display Base are shown*
- *The ENC in the ECDIS should be shown as in the picture below*



Part 4 – Test list

Existing Chart Related functions. More required?

- 4 CHART RELATED FUNCTIONS 190
- 4.1 Mode and orientation
  - Orientation, NoData,
- 4.2 Display of scale bar
- 4.3 Display of latitude bar
- 4.4 Feature information
  - Pick Reports, User defined Pick Report parameters, Feature information, Unknown Attributes, TidalStreamPanelData, Supporting Files (IMG/Text)
- 4.5 Radar and Plotting Information
- 4.6 Accuracy
- 4.7 Symbols
  - Chart 1, Text Size, Units Legend, Data Quality Indicators

Parts 5,6 and 7

For each of these:

- Detection and Notification of Navigational Hazards
- Areas Where Special Conditions Exist
- Detection and Notification of the Safety Contour

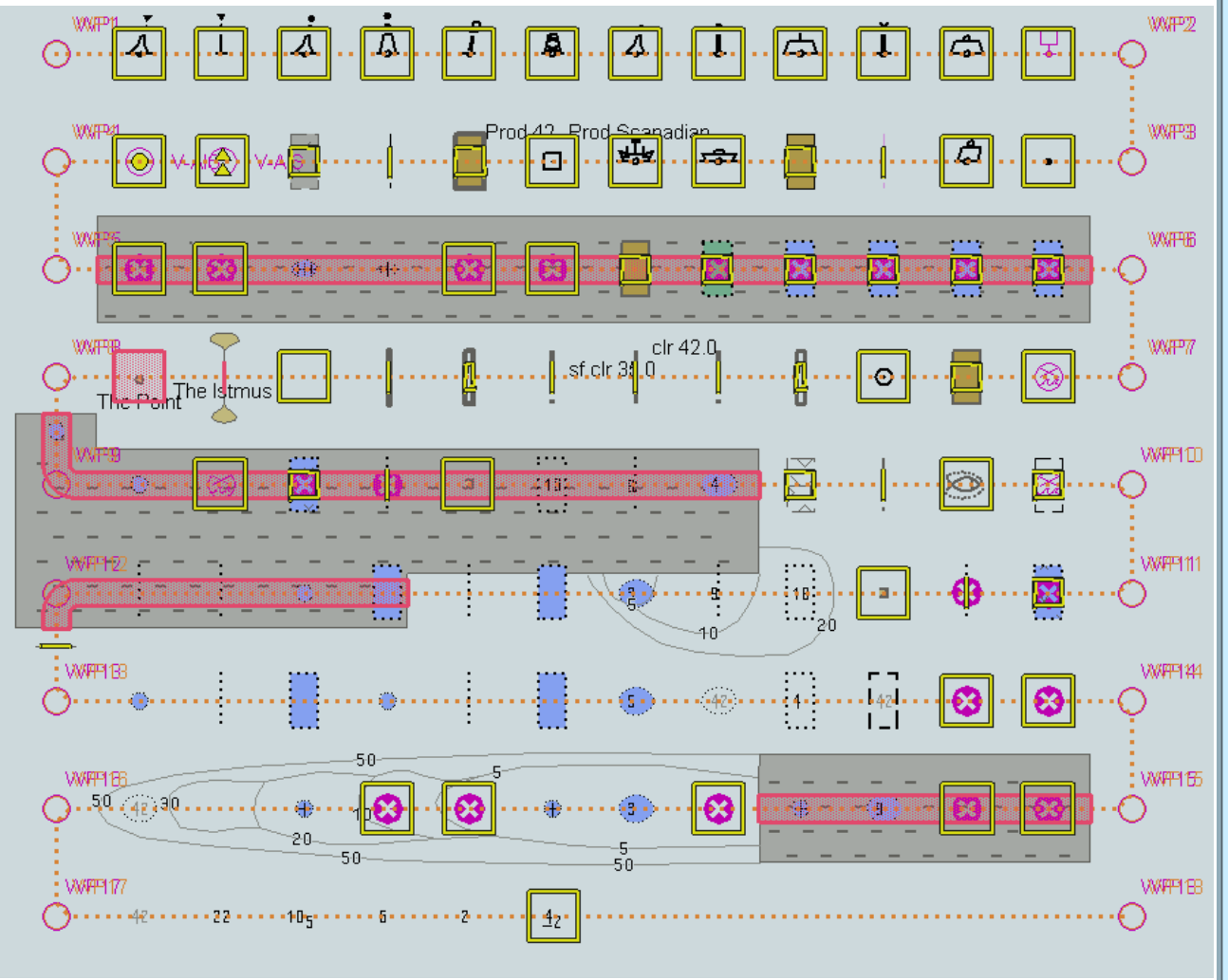
Using Dataset

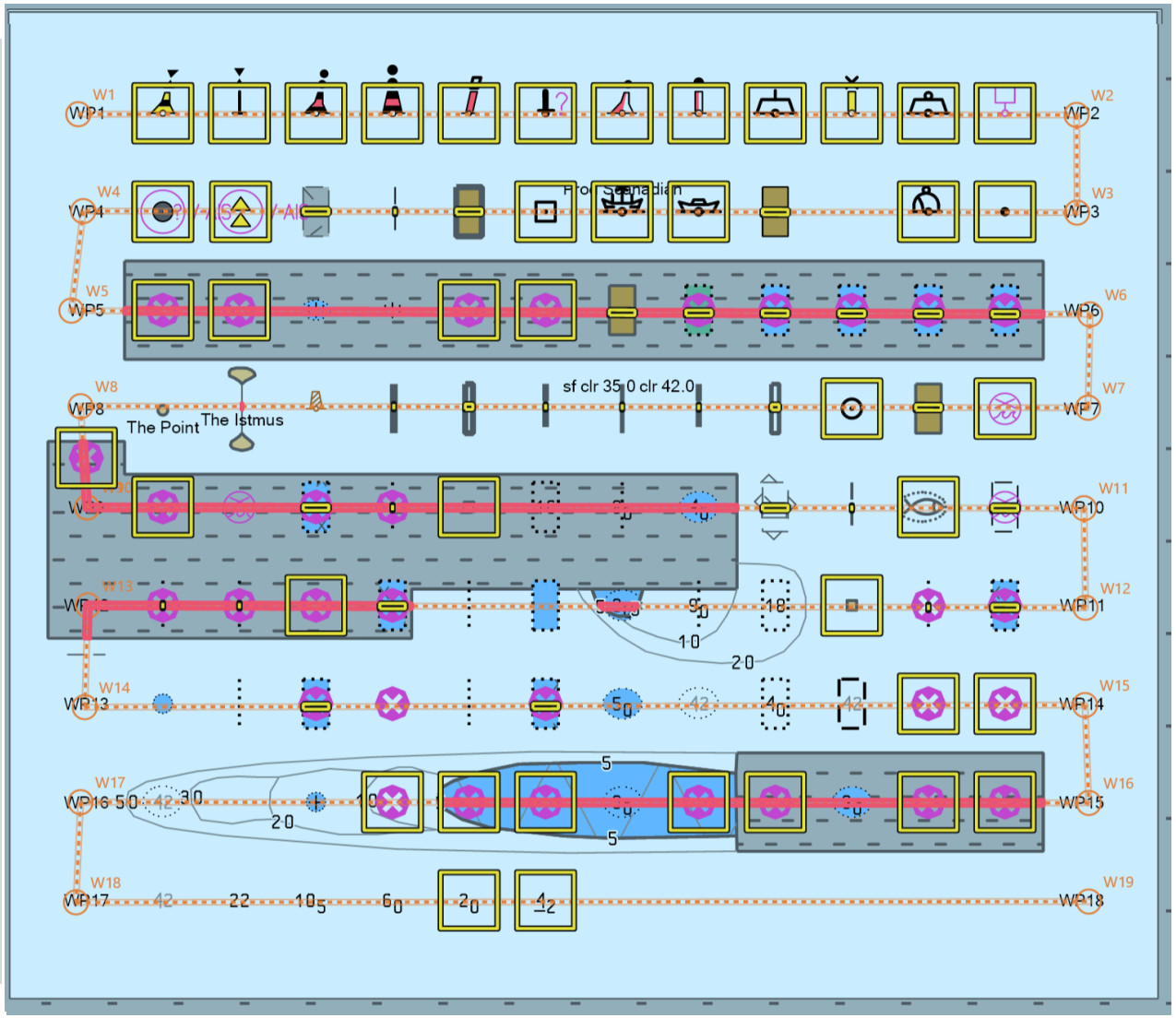
- NavHaz
- SCPC
- SAFCO

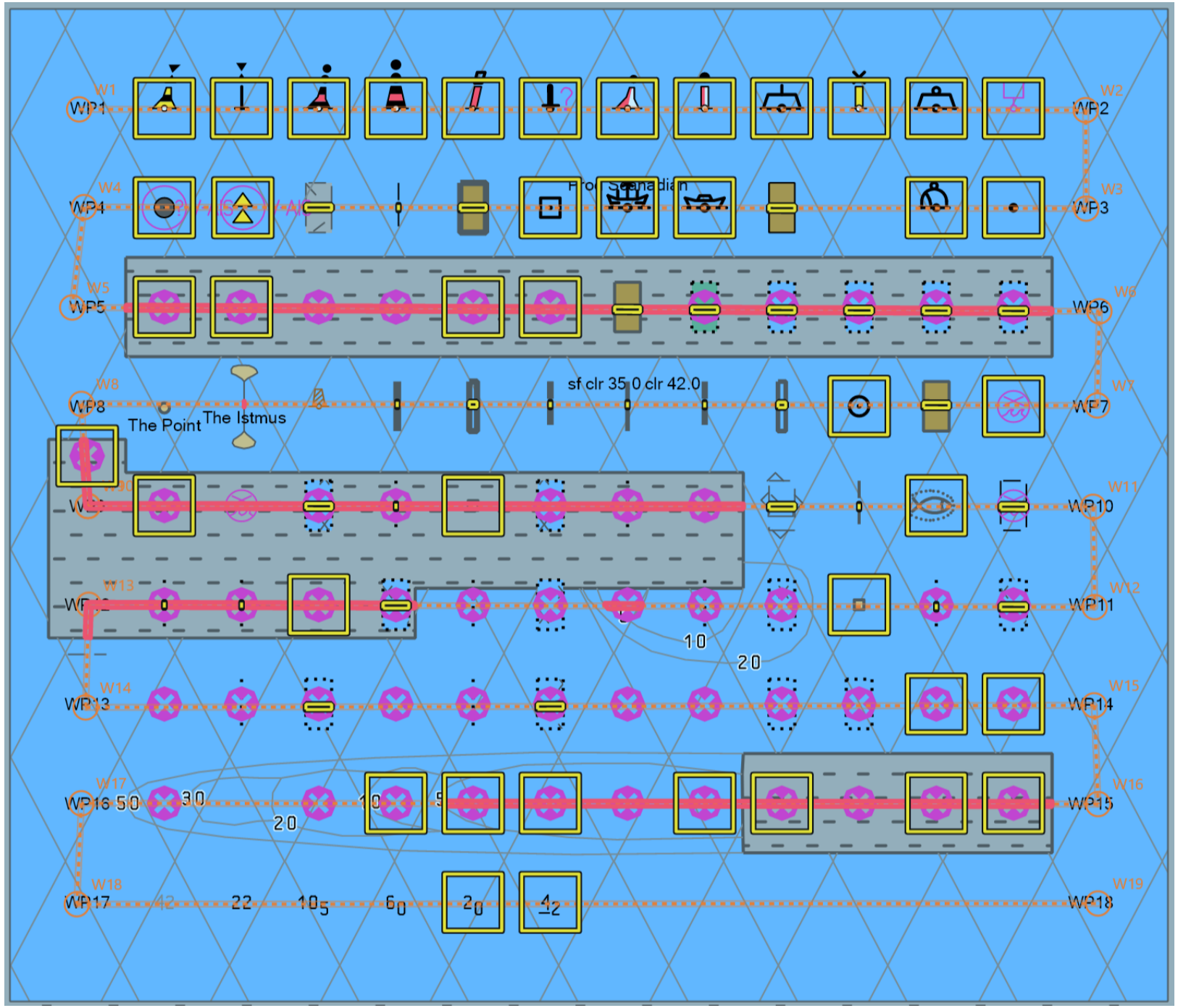
Perform these tests:

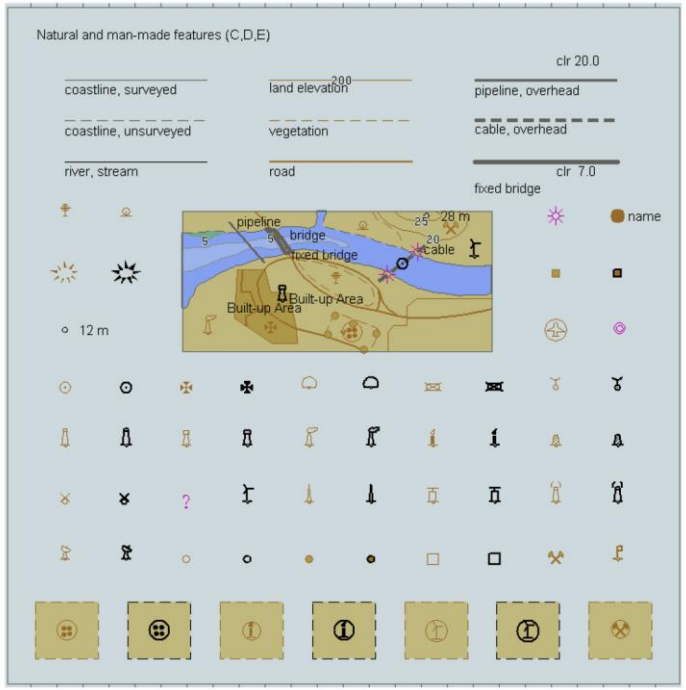
- Basic Test – Navigational Hazards
- Use of Largest Scale Available *(+OvrVu dataset)*
- Basic Test - Monitoring Mode
- Use of Largest Scale Available – Monitoring Mode*(+OvrVu dataset)*

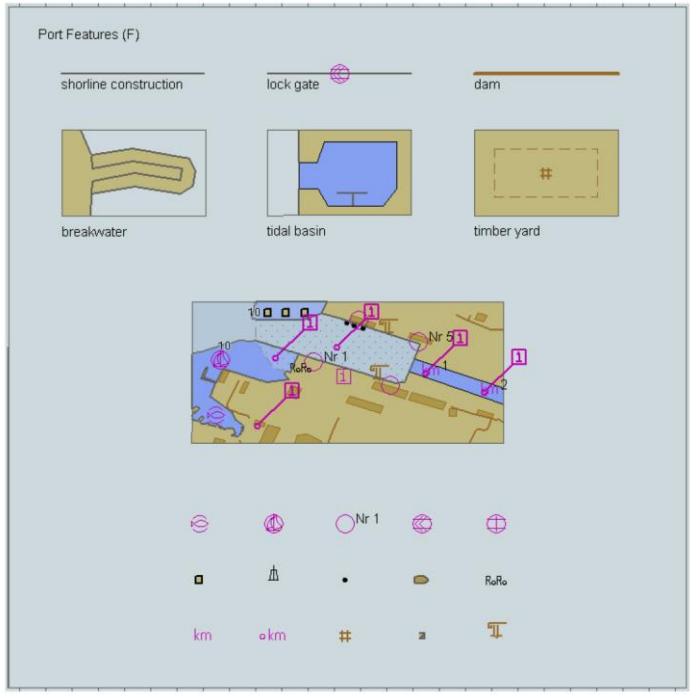
These only use S-101 and S-102/S-104 (WLA/USSC). Dual Fuel only adds S-57 alongside for testing. Are we missing anything? Data Quality Portrayal to be added…

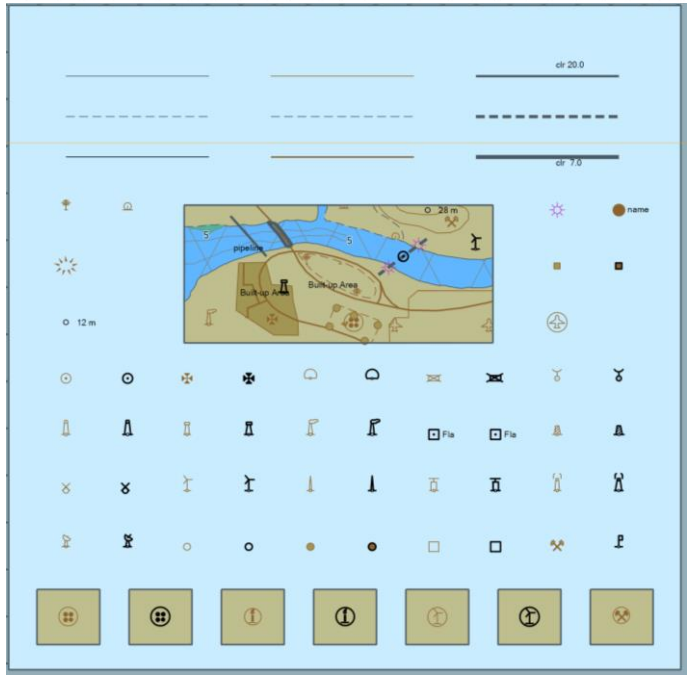

WP1
WP2
WP4
WP3
Prod 42 Prod Scanadian
WP5
WP6
WP8
WP7
The Point
The Istmus
sf clr 35.0
clr 42.0
WP9
WP10
WP12
WP11
WP13
WP14
WP15
WP16
WP17
WP18


W1
WP1
W2
WP2
W4
WP4
W3
WP3
W5
WP5
W6
WP6
W8
WP8
The Point
The Istmus
sf clr 35.0 clr 42.0
W7
WP7
W11
WP10
W12
WP11
W14
WP13
W15
WP14
W17
WP16
W16
WP15
W18
WP17
W19
WP18


W1
WP1
W2
WP2
W4
WP4
W3
WP3
W5
WP5
W6
WP6
W8
WP8
The Point
The Istmus
sf clr 35.0 clr 42.0
W7
WP7
W11
WP10
W13
WP11
10
20
W14
WP13
W15
WP14
W17
WP16
50
30
20
10
5
W16
WP15
W18
WP17
42
22
10
5
6
0
2
0
4
2
W19
WP18







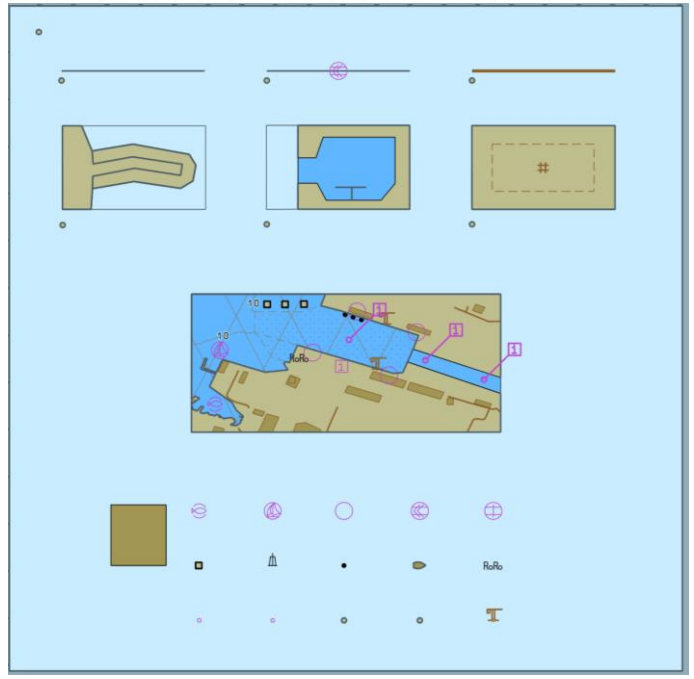


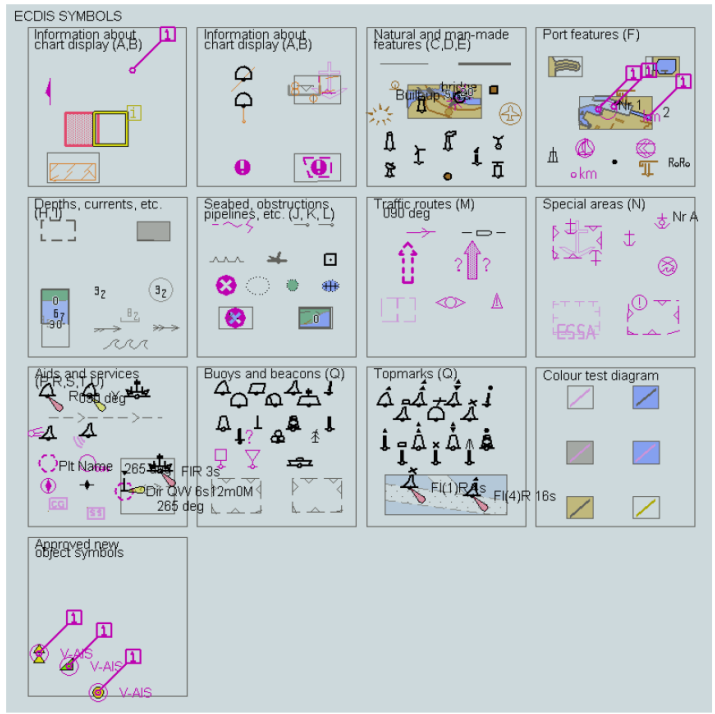
Chart 1, Part 1

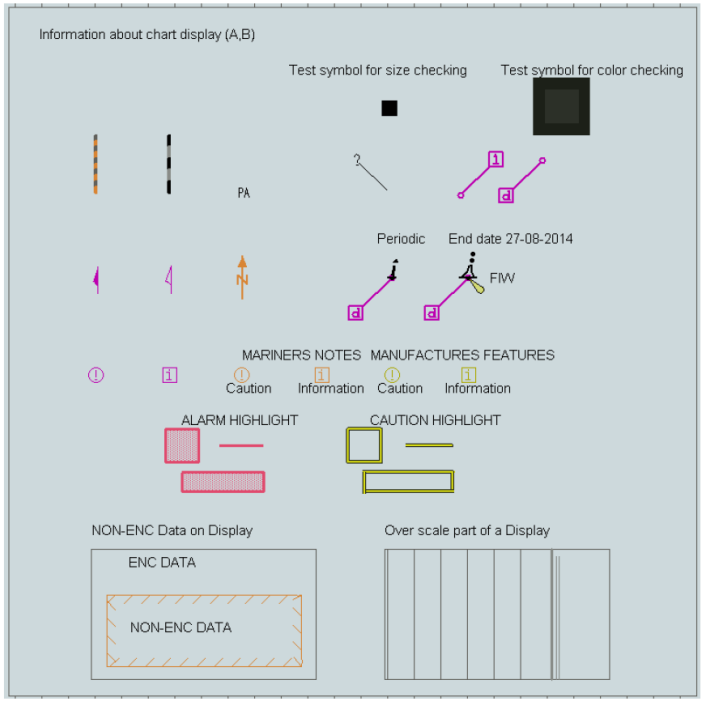
Chart 1, Part 2

- Proposal: Relocate screen shots and tests to S-164?
- Currently in S-52 Part 1

16.2 ECDIS Chart 1

ECDIS Chart 1 symbols





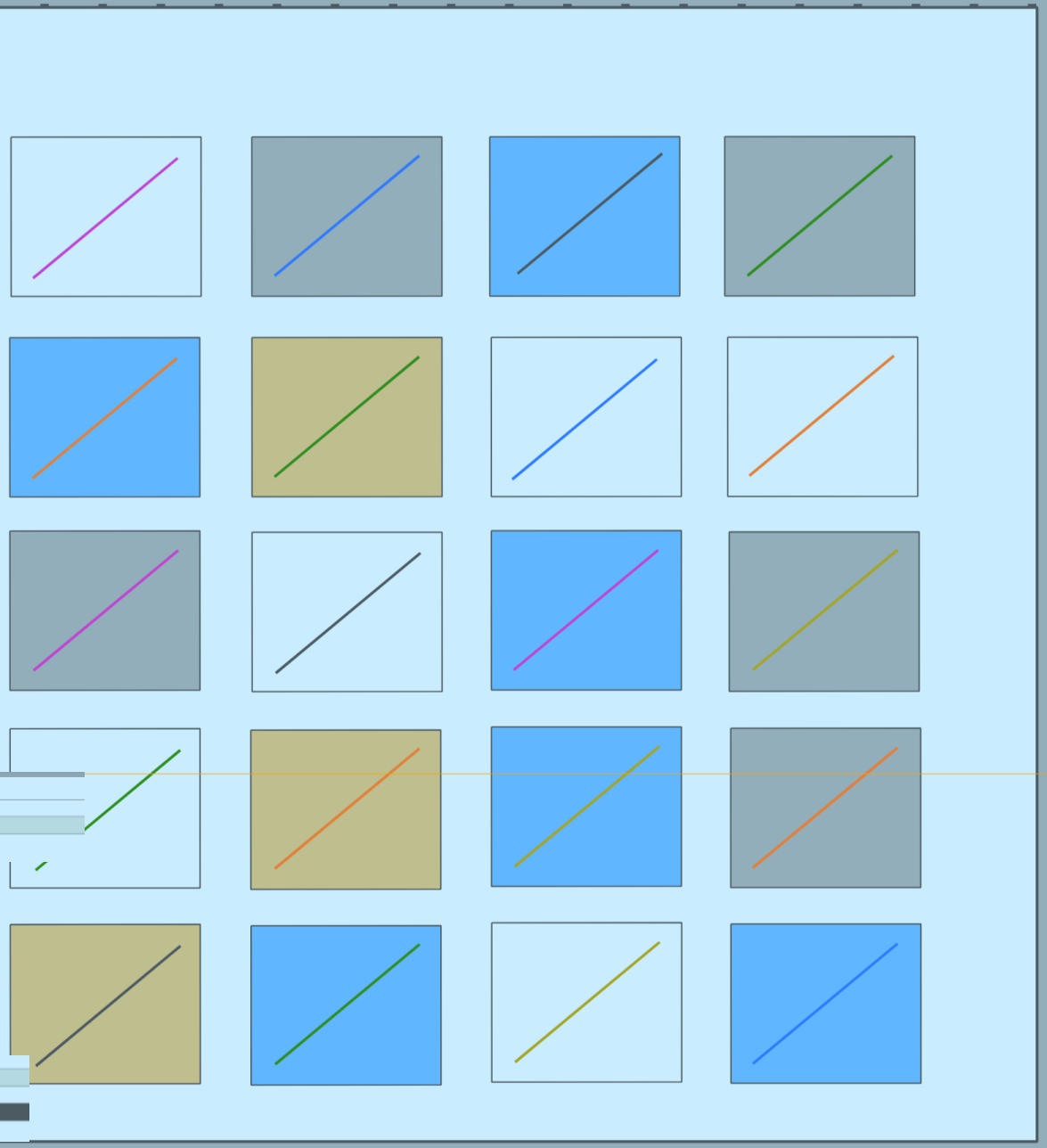
4.9 Other Chart Related Functionality

4.9.1 ECDIS Chart 1

Test Reference	ChartOne	**IHO Reference**	S-52 18.2.2
Test description			
Display of ECDIS chart 1.			
Setup			
N/A			
Action			
Navigate to ECDIS chart 1. *Compare the displayed image with the plots provided in S-98 XXX-XXX. To ensure the same display the ECDIS under test must be configured per the instructions of the ECDIS Chart1 README.TXT;* • *Set Safety Contour value to 10 m* • *Set Shallow Contour value to 5 m* • *Set Deep Contour value to 30 m* • *Set Safety Depth value to 8 m* • *Select Display Category Other* • *Select all Text groups* • *Select Symbolized Boundaries* • *Select Simplified Point Symbols = false* • *Select Contour label* • *Select Four Shades* • *Select Unknown* *Screen plots are as displayed by compilation scale, that is 1:60 000 or 1:14 000. Screen plot number 1 is 1:60 000 and all others are 1:14 000.* *Two of the screen plots (numbers 11 and 13) use "Select Simplified Point Symbols" ~~instead of "Select Paper Chart Symbols~~". One screen plot (number 6) use "Select Accuracy".*			
Results			
Confirm that ECDIS chart 1 is displayed. *Confirm that the displayed image is consistent with the plots provided in S-98.*			

Test Reference	ChartOne2	**IHO Reference**	S-52 18.2.2
Test description			
Interrogation of ECDIS chart 1.			
Setup			
With ECDIS chart 1 displayed.			
Action			
Interrogate 3 symbols by cursor pick.			
Results			
Upon interrogation the description of the symbol as contained in the Presentation Library is presented.			

```
- Name: CheckSym # Was NEWOBJ
  Foid: 1810:329988596:440
  Prim: Point
  Attributes:
    - Name: symbolisationInstruction
      Value: CHKSYM01
  Geometry: P11062
```



Name	Product	Version	Issued	Hash	Installed
portrayal_catalogue.xml	S-101	1.2.0-PR		91B1-9290-364D-6C9E	2024-03-06 12:33:47
portrayal_catalogue.xml	S-101	1.3.0-CHKSYM		4F54-A82F-351F-B9FD	2024-03-06 13:48:54

Name	Product	Version	VersionDate	Issued	Portrayal Catalog	Hash	Installed
S-101_FC_1.2.2.xml	S-101	1.2.2-DRAFT	2024-03-14 00:00:00		1.2.0-PR (6C9E)	1E9C-1CF6-00B4-FB8B	2024-03-06 12:33:20
S-101_FC_1.3.0.xml	S-101	1.3.0	2024-01-18 00:00:00		1.3.0-CHKSYM (B9FD)	D198-A36C-7EC6-F7FF	2024-03-06 13:39:27

10100AA_STNDR.000	INT.IHO.S-101.1.2.0	3	0			1:12,000	1:200,000	1.2.2-DRAFT (FB8B)	2024-03-06 12:35:06
10100AA_DBASE.000	INT.IHO.S-101.1.2.0	3	0			1:12,000	1:200,000	1.2.2-DRAFT (FB8B)	2024-03-06 12:35:07
10100AA_OTHER.000	INT.IHO.S-101.1.2.0	3	0			1:12,000	1:200,000	1.2.2-DRAFT (FB8B)	2024-03-06 12:35:07
101AA005C1WOO.000	INT.IHO.S-101.1.3.0	2	0			1:22,000	1:180,000	1.3.0 (F7FF)	2024-03-06 13:47:54

CheckSym.lua

```
if feature.PrimitiveType == PrimitiveType.Point then
     -- Simplified and paper chart points use the same symbolization
     viewingGroup = 21020
     featurePortrayal:AddInstructions('ViewingGroup:21020;DrawingPriority:12;DisplayPlane:UnderRADAR')

     if feature.symbolisationInstruction then
        featurePortrayal:AddInstructions('PointInstruction:' .. feature.symbolisationInstruction)
     else
        -- default ?
        featurePortrayal:AddInstructions('PointInstruction:CHKPNT01')
     end

  elseif feature.PrimitiveType == PrimitiveType.Curve then
```

The Graphical Catalogue

- Can it be done with S-128?

S-128 Scenarios and Update Status Reports.

- Have we captured all the relevant scenarios?