Inside S-100

Technical overview

Introduction

Providing support not only for nautical charts but also for other marine or hydrographic-related digital data, e.g. gridded bathymetry, NtMs, tides, weather ...

- Based on ISO 19100 series of geospatial standards, developed by the ISO TC 211
- Closely aligned with other standards, e.g. Open Geospatial Consortium (OGC)

Introduction

Dividing technical specifications from product specifications

- S-100 only specifies the data models, data formats, presentation mechanisms and encapsulation
- S-10x specifiy the content of data and the presentation (how and not with what)

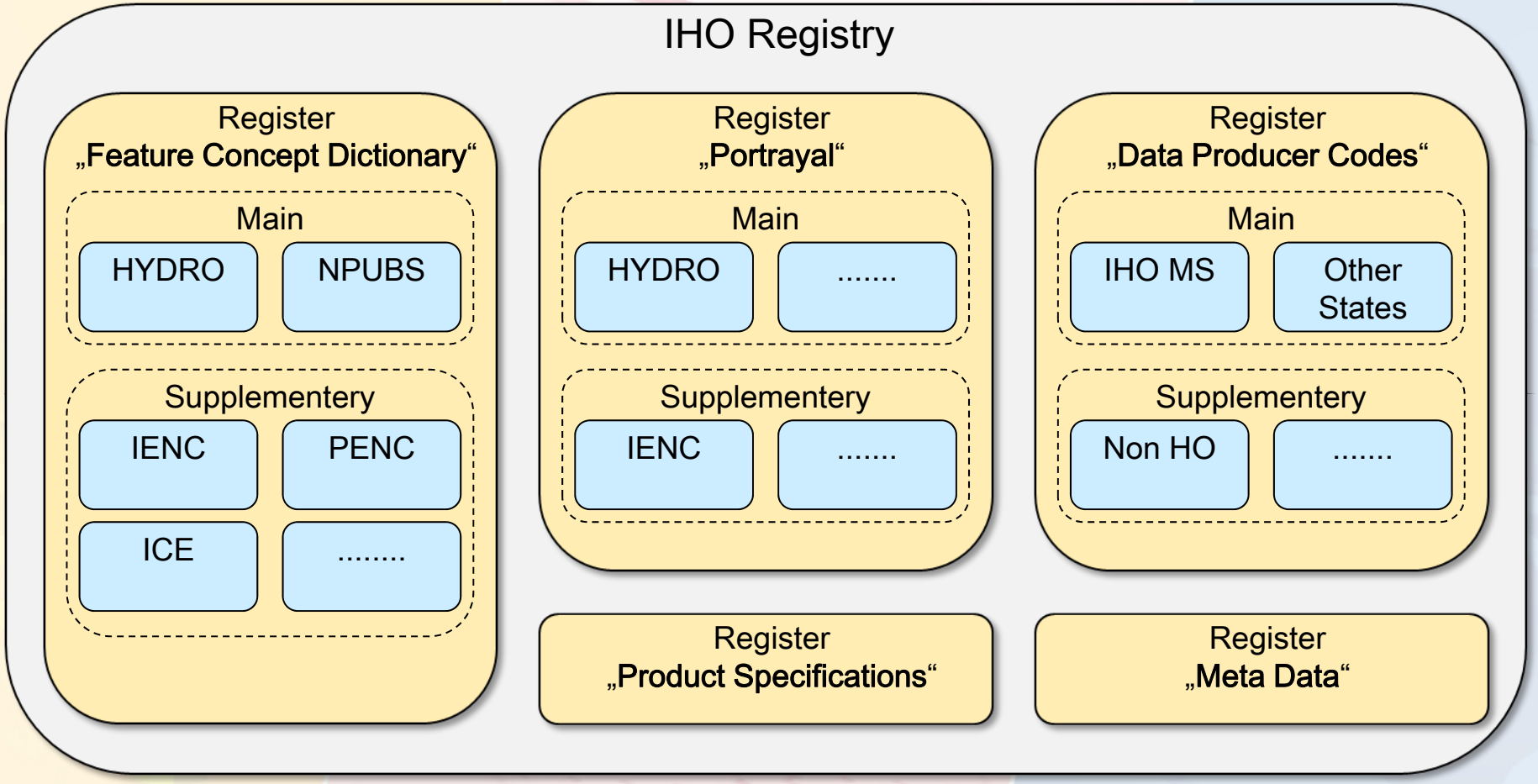
Content

- Part 1 – Conceptual Schema Language
- Part 2 – **Management of IHO Geospatial Information Registers**
- Part 3 – **General Feature Model**
- Part 4 – Metadata
- Part 5 – **Feature Catalogue**
- Part 6 – Coordinate Reference Systems

Content

- Part 7 – **Spatial Schema**
- Part 8 – Imagery and Gridded Data
- Part 9 – **Portrayal**
- Part 10 – Encoding (Encapsulation) Formats
- Part 11 – Product Specifications
- Part 12 – Maintenance

Management of IHO Geospatial Information Registers

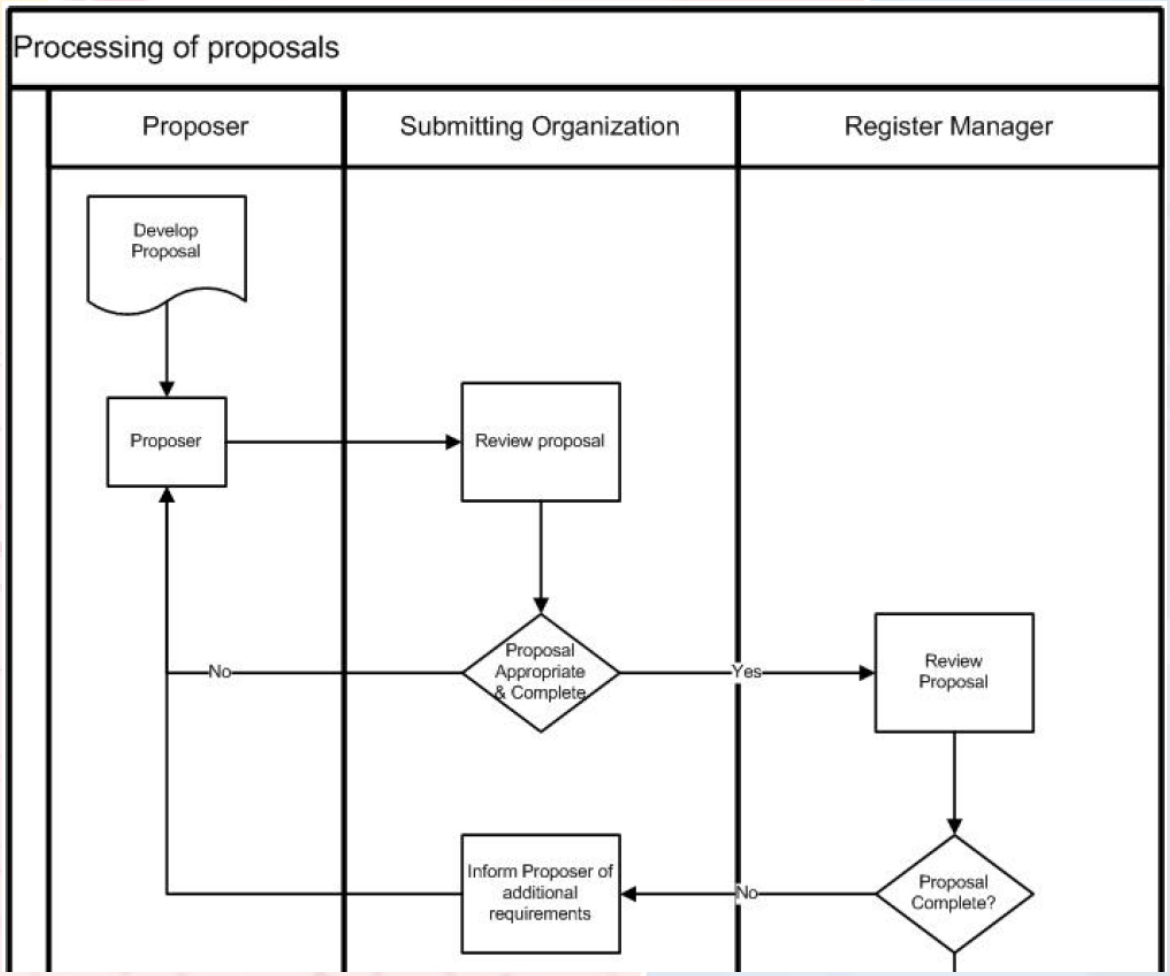


Register Roles

- **Register Owner** (IEHG)
- **Register Manager** (Pieta Kluytenaar, Denise LaDue)
- **Control Body** (IEHG)
- **Submitting Organizations** (IEHG)
- **Register User** (anyone interested in InlandENCs, e.g. member of waterway authorities, skipper representives)

Register – Proposal Process

- Evaluation
- Approval
- Withdrawal
- Appeals



Feature Concept Dictionary (FCD) Registers

- **Feature**
  Abstraction of real world phenomena.
- **Attribute**
  Description of the characteristic of a feature.
- **Enumerated Value**
  One of a list of possible values for an attribute
- **Information**
  Abstraction of thematic information without any spatial relation

- A FCD does not contain feature-attribute bindings, units, etc.

FCD Rules

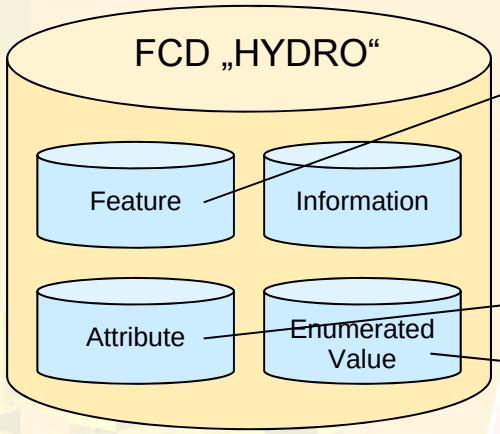
- In a FCD items are registered for ever, i.e. an item must never be deleted.
- Instead of deleting items there status is set to either **superseded** or **retired**
- Syntax errors do not require change of status

Example:

Changed definition of a feature →Status = superseded

Feature moves to another FCD → Status = retired

FCD vs. Feature Catalogue



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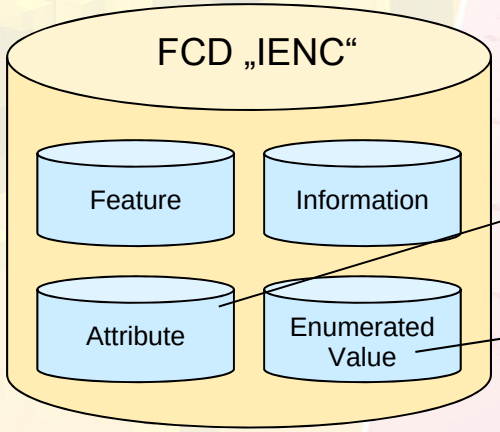

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Feature

Name:	Anchorage area
Code:	AnchorageArea
Alias:	ACHARE
Primitive:	point, surface
FCD Reference:	HYDRO
Attribute Bindings:	**Attribute 1**

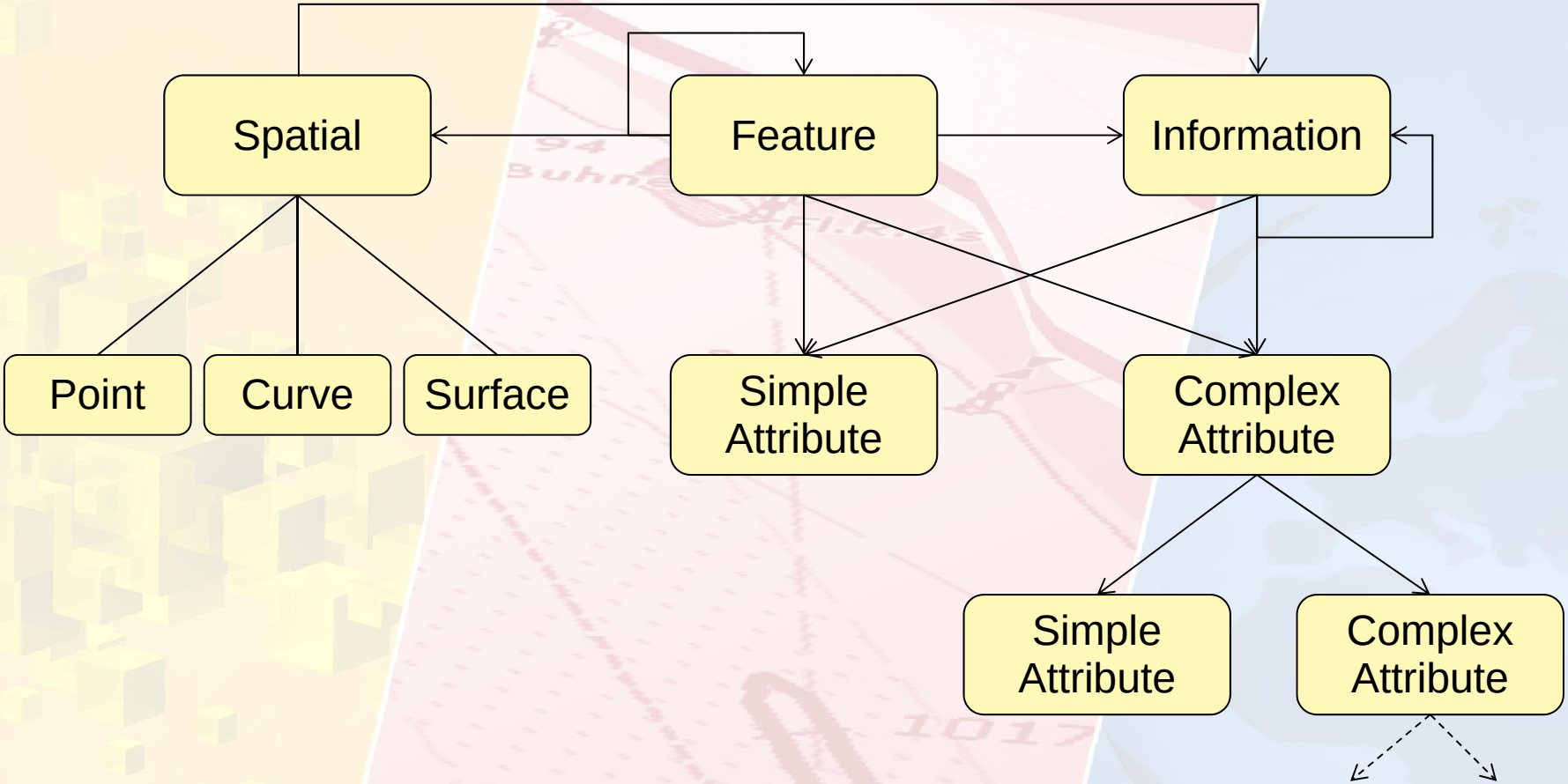
Attribute 1

Name:	Category of anchorage
Code:	categoryOfAnchorage
Alias:	CATACH
Type:	Enumeration
Values:	1,3,4,5,6,7,8,9,10
Sequential:	False
Multiplicity:	1 to 1 (mandatory)
FCD Reference:	HYDRO

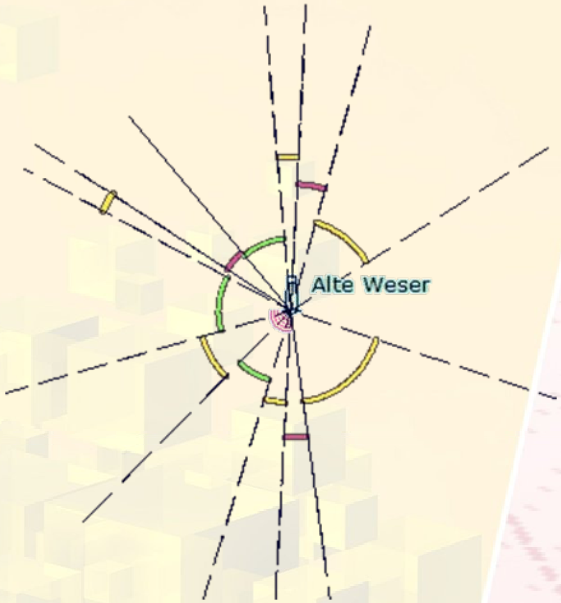
Attribute 2

Name:	Class of dangerous cargo
Code:	classOfDangerousCargo
Alias:	clsdng
Type:	Enumeration
Values:	1,2,3,4
Sequential:	False
Multiplicity:	0 to 1 (optional)
FCD Reference:	IENC

General Feature – Spatial Model



Example: Complex Attribute



Feature:	Light	
Attribute (simple)	**Value**	
Light Characteristic:	Fixed	
Height:	33	
Attribute (complex)	**Attribute (simple)**	**Value**
Light Sector:	Sector limit 1:	246
	Sector limit 2:	286
	Colour:	White
	Value of nominal range:	24
Light Sector:	Sector limit 1:	286
	Sector limit 2:	314
	Colour:	Green
	Value of nominal range:	20
Light Sector:	...	...

Portrayal

- Still under development!
- Completely mashine readable
- Rule based, script language
- Exchange format is XML

```
RULE BCNCAR01( IN FEATURE_TYPE this ) : [ BCNCAR ]
{
  VAR SYMBOL symbol;
  VAR INTEGER catcam := this.getAttribute("CATCAM", 0, 0);
  VAR STRING  objnam := this.getAttribute("OBJNAM", 0, "");
  VAR BOOLEAN hasName := length(objnam) > 0;

  VAR INTEGER num := this.geometryCount();
  VAR INTEGER i := 0;

  WHILE ( i < num )
  {
    VAR GM_OBJECT gobj := this.getGeometry(i);
    IF (gobj.isPoint())
    {
      VAR GM_POINT pnt := gobj.toPoint();
      SWITCH ( catcam )
      {
         CASE (1)
            POINT_SYMBOL(pnt, 8, 17020, "O", "BCNCAR01");
         CASE (2)
            POINT_SYMBOL(pnt, 8, 17020, "O", "BCNCAR02", 0);
         CASE (3)
            POINT_SYMBOL(pnt, 8, 17020, "O", "BCNCAR03", 0);
         CASE (4)
            POINT_SYMBOL(pnt, 8, 17020, "O", "BCNCAR04", 0);
         DEFAULT
            POINT_SYMBOL(pnt, 8, 17020, "O", "BCNDEF13", 0);
      }
      IF ( hasName )
        TEXT(pnt, 8, 17020, "O", "bn " + objnam, 2, 1, 2,
             15110, "CHBLK", 21);
    } /* SWITCH */
    i := i + 1;
  } /* WHILE */
}
```

Many thanks for this opportunity

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