

# International Hydrographic Organization



## S-100 Geospatial Information Registry Brief



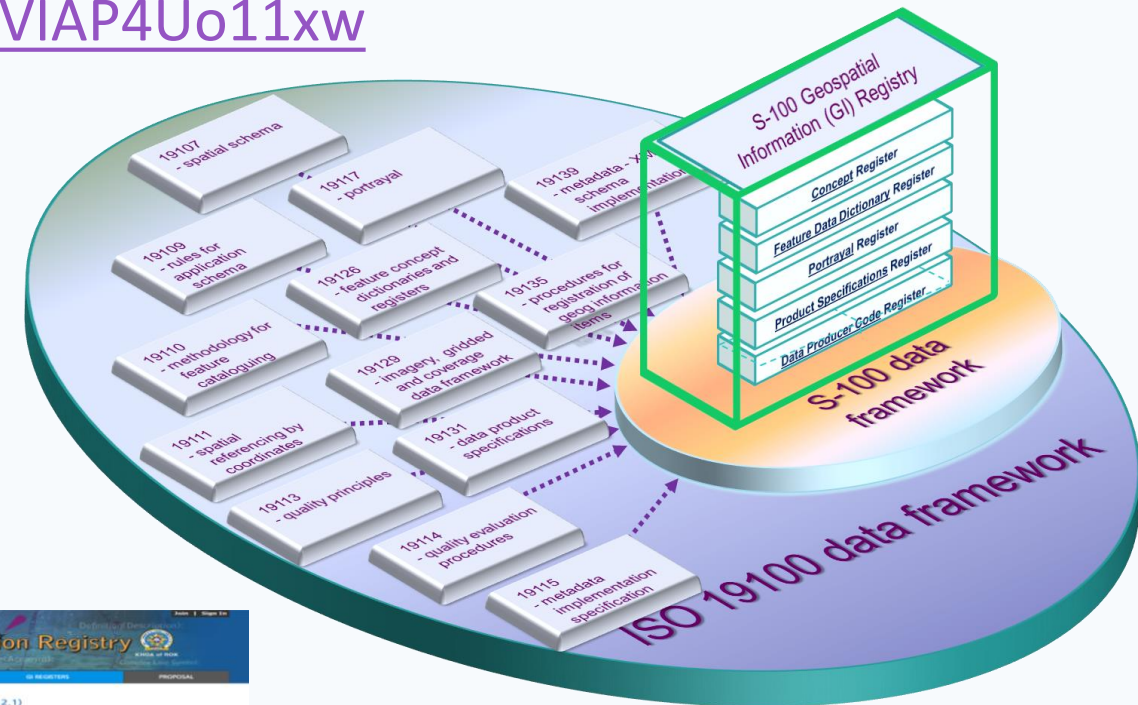
# S-100 Introduction

S-100 Intro video - <https://www.youtube.com/VIAP4Uo11xw>

January 2010 - IHO adopted S-100

S-100 is underpinned by a Geospatial Information (GI) **Registry** and component **Registers** based on ISO 19135

**IHO owns and manages the IHO Geospatial Information (GI) Registry**



Welcome to the S-100 Geospatial Information Registry (Version 2.1)

This registry is owned by the International Hydrographic Organization (IHO) and managed by the Secretariat of the IHO. The site contains many registers of hydrographic information together with registers of supplementary information owned by specialist domain experts. Each register has a further sub-domain and a hydrographic metadata publication, see below (PDF). The administration of this registry conforms to ISO Publication 19135 Operational Procedures for the Organization and Management of the S-100 Geospatial Information Registry, a copy of which can be downloaded [here](#).

The information contained in the Registry can be freely accessed. However items can only be added or changed by the managers of approved Submitting Organizations. Application to become a Submitting Organization can be made by fulfilling the requirements of the operational procedures. Please note: It is not necessary to be a submitting organization in order to request new (S-100) Data Producer codes. Requests for new Data Producer codes, or changes to existing codes should be sent to the following email address: [info@iho.int](mailto:info@iho.int).

Once accepted as a submitting organization you are free to submit proposals to any register. The Registry interface undergoes periodic improvements and any difficulties using this site should be reported to the [Registry Managers](#).

Go to [Registry Catalogue Builder](#)

Feature Concept Dictionary Register according to S-100

No.	Type	Valid	Superseded	Retired
1	Feature Type	225	522	148
2	Information Type	22	2	0
3	Simple attribute Type	822	826	85
4	Enumerated Type	2482	823	228
5	Complex attribute Type	104	48	1
6	Code list Type	38	3	0
7	Code list value Type	222	6	0

Portrayal Register

No.	Type	Valid	Superseded	Retired
1	Acoustic	552	0	0
2	Line Shape	33	0	0
3	Area HD	16	0	0
4	Point	4	0	0

Registry Owner: Registry Manager: Registry Managers:

<http://registry.iho.int/>



# IHO Geospatial Information (GI) Registry

## ❑ Registry

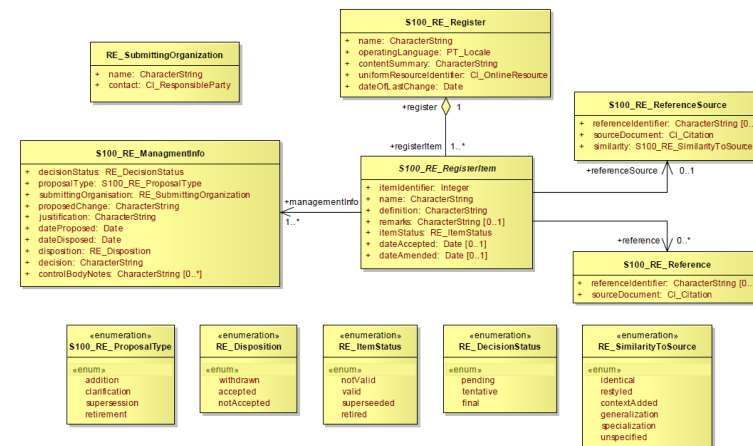
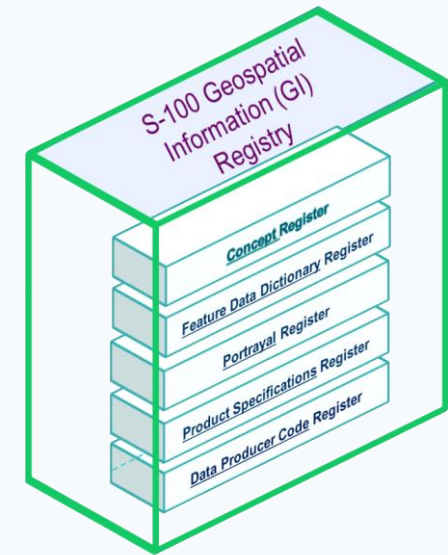
- *A registry is the information system on which registers are maintained.*

➤ **Registry** = collection of **registers**

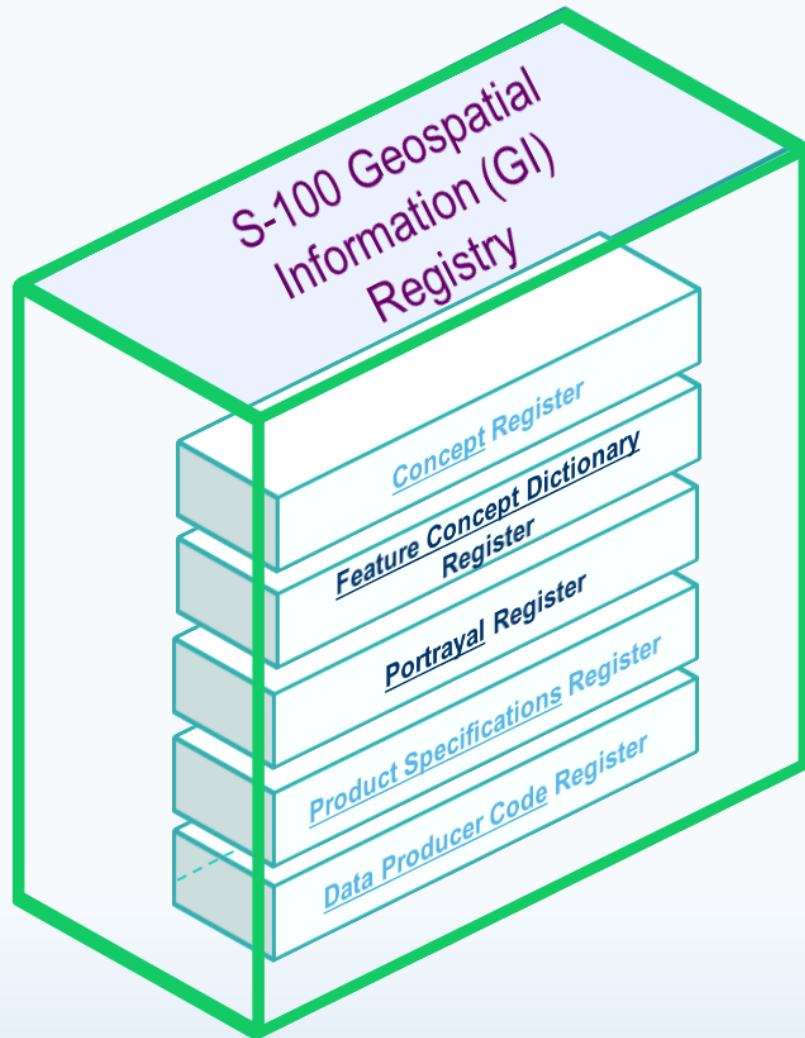
## ❑ Registers

- *A register is simply a managed list. It is easier to maintain than a fixed document, because new items can be added as needed to the register, and existing items in the register can be clarified, superseded or retired.*

➤ **Register** = collection of **tables**



# IHO GI Registry - Registers



## Feature Concept Dictionary (FCD) Register

- Register containing definitions on how to digitally describe and encode any piece of information

- a buoy
- a sounding
- a ship position
- a radio service
- .....

Details	
Item Type :	Complex Attribute
Proposal Type :	Unspecified
Domain :	DND Hydro
AlphaCode :	Unspecified
Complex AttributeName(s) :	Feature Name
Alias :	Unspecified
CancelCase :	featureName

Management Details	
Proposal Type :	Addition
Submitting Organisation :	unknown
Proposed Change :	From S-021 PT
Justification :	From S-021 PT
Proposed :	2008-02-17
Accepted :	2008-02-17
Amended :	
Successor :	-
Predecessor :	-

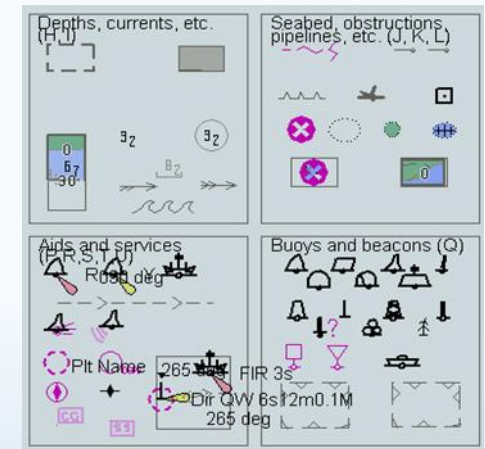
No	Attribute	Lower	Upper	Conditional
1	[Att.] Display Name	0	1	False
2	[Att.] language	0	1	False
3	[Att.] name	1	1	False

**Definition :** The complex attribute provides the name of an entity, defines the national language of the name, and provides the option to display the name at various system display settings.

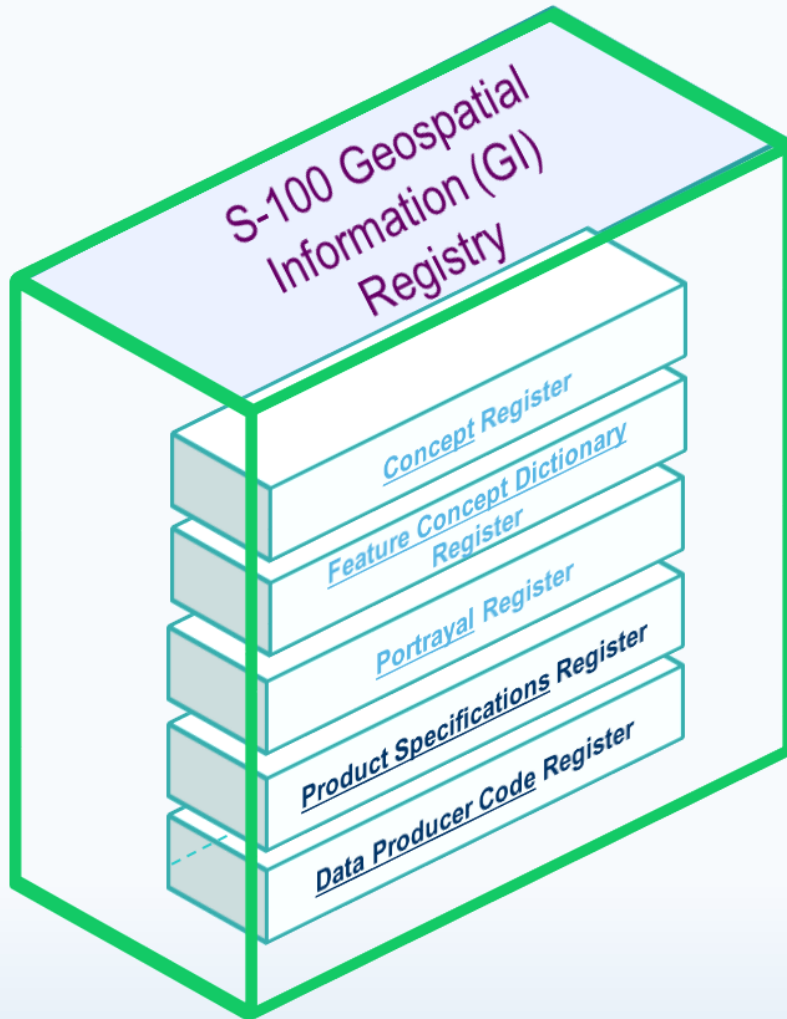
## Portrayal Register

- Register containing the elements of portrayal schemes such as

- point and pattern symbols
- complex line styles
- colour tokens



# IHO GI Registry - Registers



## Product Specifications Register

- **Repository for published versions of S-100 product specifications or data exchange standards**
  - **ENC product specification**
  - **real-time tidal height exchange standard**
  - **sea ice product specification**
  - **ship reporting exchange standard**
  - **VTMS route definition product specification**
  - **IALA, WMO, IEC, .....**
  - **AML**

S-101 ENC  
S-102 Bathymetry  
S-112 Dynamic Water Level  
S-121 Maritime Boundaries  
.....  
S-201 AtoN Information  
S-210 Inter-VTS Exchange  
.....  
S-401 Inland ENC  
S-411 Ice Information  
S-412 Weather Overlay  
.....

## Data Producer Code Register

- **Register containing the list of codes identifying the official producers of a particular data product**

**S-62**





# Register Domains

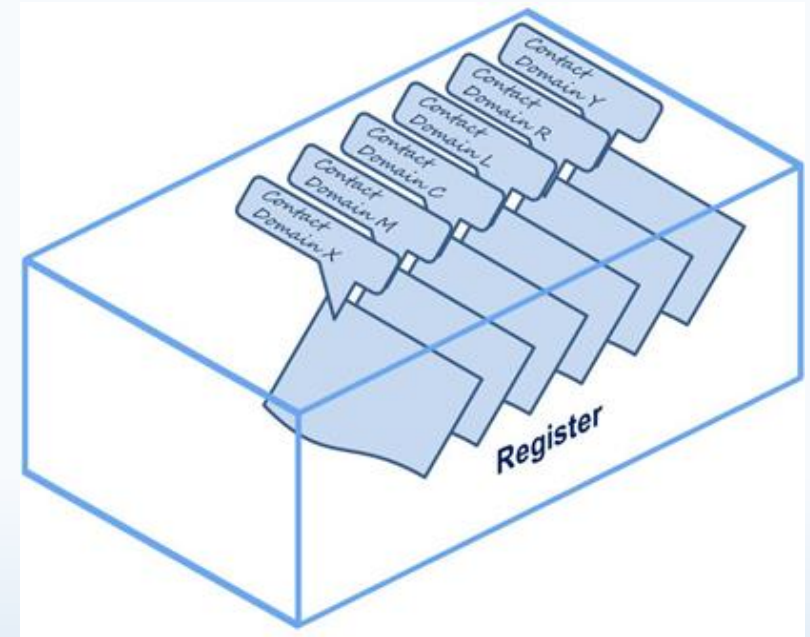
- **Domains**

*Within the Feature Concept and the Metadata Registers each entry is assigned to a recognized Domain. The purpose of designating domains and a related Domain Control Body is to ensure that the key stakeholders (as represented by the domains) are consulted in any subsequent proposals to add or amend items contained in a Register.*

**Domains of the Feature Concept Dictionary Register:**

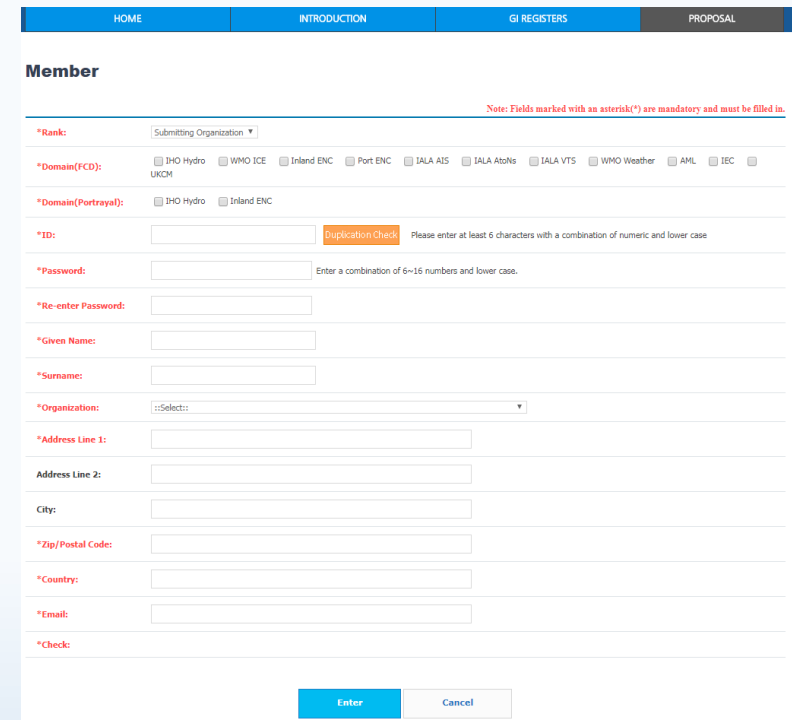
- IHO Hydrographic – (IHO Working Groups (S-100WG, NIPWG, S-101PT, TWCWG, WWNWS Sub-WG, ....))
- Inland ENC's – (IEHG)
- Sea Ice – (WMO)
- Weather – (WMO)
- IALA AtoNs – (IALA)
- IALA VTS – (IALA)
- IALA AIS – (IALA)
- Under Keel Clearance Management – (UKCM Project Team)
- IEC – (IEC)
- UML – (??)

Note: Additional domains can be added to the Register as required



# Register Domains

- Establishment of Domains
  - Any recognized organization or the Register Manager may propose a new Domain if there is a need or new requirement.
    - Application for a new Domain is submitted by email to the Register Manager.
  - IHO has an application form on-line for the establishment of roles within a Domain, with the mandatory fields for the information required for prospective members.
    - Each Domain should assign at least one representative to act as Submitting Organization and Domain Control Body representatives.
  - The Register Manager reviews all and endorses the proposals, and consults with the Executive Control Body as required.



The screenshot shows a web application interface for registering domains. At the top, there is a navigation bar with four tabs: HOME, INTRODUCTION, GI REGISTERS, and PROPOSAL. The 'GI REGISTERS' tab is currently selected. Below the navigation bar, the page is titled 'Member'. A note at the top right states: 'Note: Fields marked with an asterisk(\*) are mandatory and must be filled in.' The form contains several fields, most of which are marked with an asterisk to indicate they are mandatory. These include: \*Rank (with a dropdown menu showing 'Submitting Organization'), \*Domain(FCD) (with checkboxes for IHO Hydro, UKCM, WMO ICE, Inland ENC, Port ENC, IALA AIS, IALA AtoNs, IALA VTS, WMO Weather, AML, and IEC), \*Domain(Portrayal) (with checkboxes for IHO Hydro and Inland ENC), \*ID (with a text input field and a 'Duplication Check' button), \*Password (with a text input field and a note 'Enter a combination of 6-16 numbers and lower case'), \*Re-enter Password (with a text input field), \*Given Name (with a text input field), \*Surname (with a text input field), \*Organization (with a dropdown menu showing 'Select:'), \*Address Line 1 (with a text input field), Address Line 2 (with a text input field), City (with a text input field), \*Zip/Postal Code (with a text input field), \*Country (with a text input field), \*Email (with a text input field), and \*Check (with a text input field). At the bottom right of the form, there are two buttons: 'Enter' and 'Cancel'.



# Roles and Responsibilities

S-99 describes the expectations for the following Roles:

- Registry Owner – IHO owns the IHO GI Registry
- Registry Manager – IHO Secretariat appointed manager responsible for the day-to-day operation of the Registry
- Register Owner – IHO owns all of the registers
- Register Manager – responsible for the administration of a register
- Register Control Body
  - Domain Control Body (DCB) – assess and endorse proposals
  - Executive Control Body (ECB) – oversees the DCB operations and adjudicates disputes.
- Representatives of Submitting Organizations – nominated spokesperson for their submitting Organization.

INTERNATIONAL HYDROGRAPHIC ORGANIZATION



**Operational Procedures for the Organization  
and Management of the  
S-100 Geospatial Information Registry**

Edition 1.1.0 – November 2012

**IHO Publication S-99**

Published by the  
International Hydrographic Bureau  
MONACO





# Administration of the Registers

- The FCD and Portrayal Registers can have the following proposal submission types:
  - Addition of new registered items
  - Clarification of registered items
  - Supersession of registered items
  - Retirement of registered items

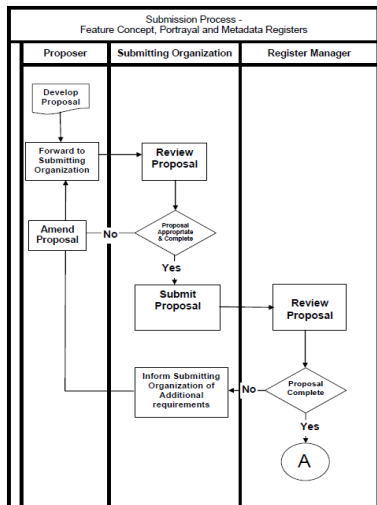


Figure 3 – Processing of Proposals

**Proposal : FCD**

Item Type :

Proposal Type :

Domain :

Dropdown menu for Proposal Type:

- ::Select::
- ::Select::
- Addition
- Clarification
- Supersession
- Retirement

**IHO Geospatial Information Registry**

Definition(Description): KHOA of ROK  
Alpha Code(Acronym):  
Complex Line Symbol:

HOME INTRODUCTION GI REGISTERS PROPOSAL

· FCD · Portrayal

**Proposal : FCD**

Select Category

Item Type :

Proposal Type :

Domain :

Continue

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KHOA Acknowledgements



# Product Specification Register

- A list of IHO Published and adopted specifications
  - S-102 - Bathymetric Surface Product Specification :  
Edition 1.0.0 - April 2012

- IHO Product Spec's under development:

- S-98 - Interoperability Specification for ECDIS
- S-101 - ENC
- S-104 - Tidal Information for Surface Navigation
- S-111 - Surface Currents
- S-121 - Maritime Limits and Boundaries
- S-122 - Marine Protected Areas
- S-123 - Radio Services
- S-124 - Navigational Warnings
- S-125 - Navigational Services
- S-126 - Physical Environment
- S-127 - Traffic Management
- S-128 - Catalogues of Nautical Products
- S-129 - Under Keel Clearance Management

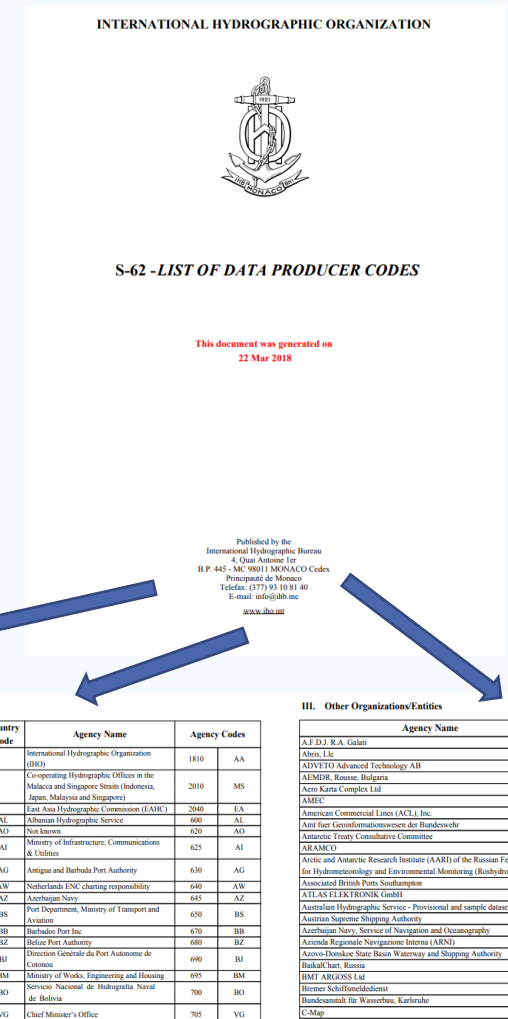


# Data Producer Code Register

The Registry web interface has two distinct lists for data Producer Codes:

- Government Authorities –allocated to Governments, authorised Hydrographic Offices or relevant government institutions.
- Others – all other accredited organizations and entities.

Conforms to IHO Publication S-62.



I. IHO Member States				
Country Name	Country Code	Agency Name	Agency Codes	
Argentina	AR	Australian Hydrographic Service (AHS)	1	AR
Australia	AU	Australian Hydrographic Service - Navy and Defence	11	AN
Bahrain	BH	Hydrographic Survey Office	20	BH
Bangladesh	BD	Hydrographic Department	660	BD
Belgium	BE	MDK - Afdeling Kart - Divisies Coast (DIN)	30	BE
Brazil	BR	Directorate of Hydrography and Navigation	40	BR
Brunei	BN	Department of Marine	710	BN
Danmark	DK	Survey Department	715	BZ
Denmark	DK	Port Autonome de Douala (PAD)	740	CM
Canada	CA	Canadian Hydrographic Service (CHS)	50	CA
Canada	CA	Canadian Forces	51	C4
Chile	CL	Servicio Hidrográfico y Oceanográfico de la Armada (SHOA)	60	CL
China	CN	Maritime Safety Administration (MSA)	70	CN
China	CN	The Navigation Guarantee Department of The Chinese Navy Headquarters	71	C1
China	CN	Hong Kong Special Administrative Region	72	C2
China	CN	Macau Special Administrative Region	73	C3
Colombia	CO	Ministerio de Defensa Nacional	760	CO

II. Other States				
Country Name	Country Code	Agency Name	Agency Codes	
		International Hydrographic Organization (IHO)	1810	AA
		Co-operating Hydrographic Offices in the Malacca and Singapore Straits (Indonesia, Japan, Malaysia and Singapore)	2010	MS
		East Asia Hydrographic Commission (EAHC)	2040	EA
Albania	AL	Albanian Hydrographic Service	600	AL
Angola	AO	Not known	620	AO
Anguilla	AI	Ministry of Infrastructure, Communications & Utilities	625	AI
Antigua and Barbuda	AG	Antigua and Barbuda Port Authority	630	AG
Aruba	AW	Netherlands ENC charting responsibility	640	AW
Azerbaijan	AZ	Azerbaijan Navy	645	AZ
Bahamas	BS	Port Department, Ministry of Transport and Aviation	650	BS
Barbados	BB	Barbados Port Inc	670	BB
Belize	BZ	Belize Port Authority	680	BZ
Belize	BZ	Direction Générale du Port Autonome de Cotonsou	690	BZ
Bermuda	BM	Ministry of Works, Engineering and Housing	695	BM
Bolivia	BO	Servicio Nacional de Hidrografía Naval de Bolivia	700	BO
British Virgin Islands	VG	Chief Minister's Office	705	VG

III. Other Organizations/Entities				
		Agency Name	Agency Codes	
		A.F.D.J. R.A. Galati	16203	3R
		Alsea, LLC	36363	BT
		ADVENT Advanced Technology AB	20116	4S
		AEMDR, Roussie, Bulgaria	15163	3B
		Aero Karta Complex Ltd	16038	3Z
		AEMC	27282	6A
		American Commercial Lines (ACL), Inc.	23130	5A
		Amit fuer Geoinformationssysteme der Bundeswehr	7453	1D
		Antarctic Treaty Consultative Committee	1660	QM
		ARASMO	6682	1A
		Arctic and Antarctic Research Institute (AARI) of the Russian Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet)	19018	4A
		Associated British Ports Southampton	44444	5S
		ATLAS ELECTRONIC GmbH	5678	0R
		Australian Hydrographic Service - Provisional and sample datasets	32328	7U
		Austrian Supreme Shipping Authority	7980	1S
		Azerbaijan Navy, Service of Navigation and Oceanography	31354	7A
		Academia Regional Navagacione Interna (ARNI)	10794	2A
		Azov-Donkoe State Basin Waterway and Shipping Authority	14906	3A
		BeikaChart, Russia	19275	4B
		BMT ARGOSS Ltd	3617	0M
		Bremer Schiffahrtsdienst	24181	5H
		Bundesanstalt für Wasserbau, Karlsruhe	11051	2B
		C-Map	12083	2F



# Not just for the IHO ....

- Non-IHO Product Specifications

- IALA S-201 - Aids to Navigation Information
- IALA S-210 - Inter-VTS Exchange Format
- IALA S-230 - Application Specific Messages
- IALA S-240 - DGNSS Station Almanac
- IALA S-245 - eLoran ASF Data
- IALA S-246 - eLoran Station Almanac
- IEHG S-401 - Inland ENC
- IEHG S-402 - Bathymetric Inland ENC
- WMO JCOMM S-401 - Ice Information
- WMO JCOMM S-402 - Weather Overlay



- GI Registry: IALA, IEC, IEHG & WMO JCOMM currently involved in maintaining domains in the FCD Register



# S-100 Howto

- Identify the requirement
  - What information does one want to exchange in a digital, standardised way ?
  - “enter once – use many” applications

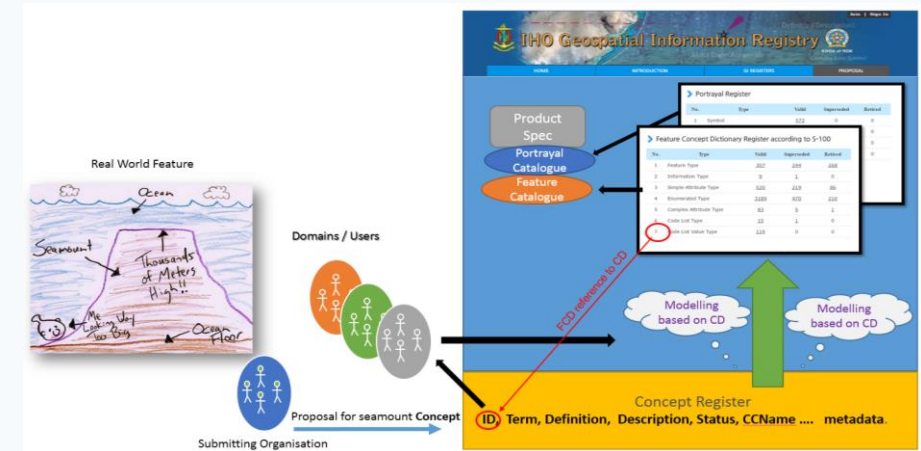
**FCD Register**

Domain:  Item Type:  Status:  [Go to index](#)

Search:

Details		Management Details	
Item Type :	Enumerated	Proposal Type :	Addition
Proposal Type :	Unspecified	Submitting Organization :	unknown
Domain :	IHO Hydro	Proposed Change :	NULL
Associated Attribute :	<input type="text" value="categoryOfSeaArea (Valid)"/>	Justification :	NULL
EnumeratedName:	seamount	Proposed :	
Enumerated Value Code Number :	16	Accepted :	
Enumerated Value Code In Use :		Amended :	
Alias :	Unspecified	Successor :	-
CancelCase :	seamount	Predecessor :	-
Definition :	a large isolated elevation, greater than 1000m in relief above the sea floor, characteristically of conical form.		
Reference :			
Definition Source :			
Similarity to Source :	Unspecified		
Int1 :	<input type="text" value=""/>		
S4 :	<input type="text" value=""/>		
Remarks :	Unspecified		

[Back](#)



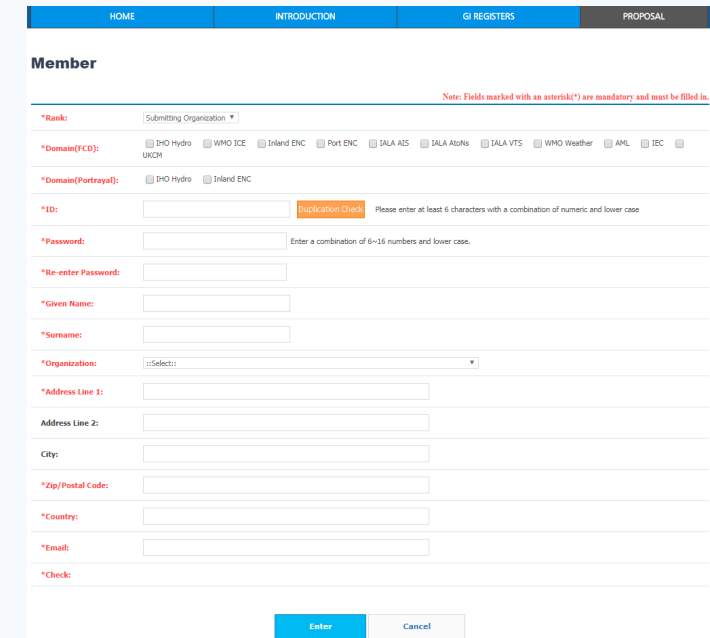
- Are the definitions that one needs already in the S-100 Registry?
  - Yes => Go ahead
  - develop own Product Specification / Exchange Standard





# S-100 Howto

- No? (Definitions not in the registry):
  - Find or become a submitting organization to:
    - revise an existing entry
    - propose something new
  - Then develop own Product Specification / Exchange Standard



The screenshot shows the 'Member' registration page of the International Hydrographic Organization (IHO). The page has a navigation bar with 'HOME', 'INTRODUCTION', 'GI REGISTERS', and 'PROPOSAL'. The 'Member' section includes a note: 'Note: Fields marked with an asterisk(\*) are mandatory and must be filled in.' The form fields are: \*Rank: Submitting Organization; \*Domain(FCD): IHO Hydro, IHO XCE, Inland ENC, Port ENC, IALA AIS, IALA Abnls, IALA VTS, WMO Weather, AML, IEC; \*Domain(Portrayal): IHO Hydro, Inland ENC; \*ID: (with a 'Duplication Check' button and a note: 'Please enter at least 6 characters with a combination of numeric and lower case'); \*Password: (with a note: 'Enter a combination of 6-16 numbers and lower case'); \*Re-enter Password; \*Given Name; \*Surname; \*Organization: (a dropdown menu); \*Address Line 1; Address Line 2; City; \*Zip/Postal Code; \*Country; \*Email; and \*Check. At the bottom are 'Enter' and 'Cancel' buttons.

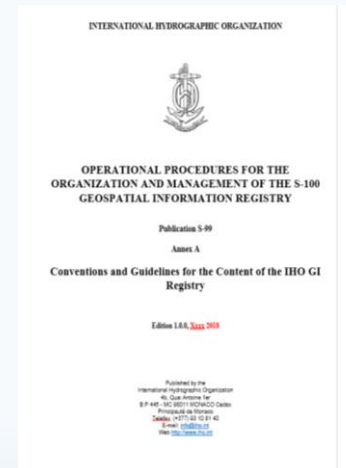
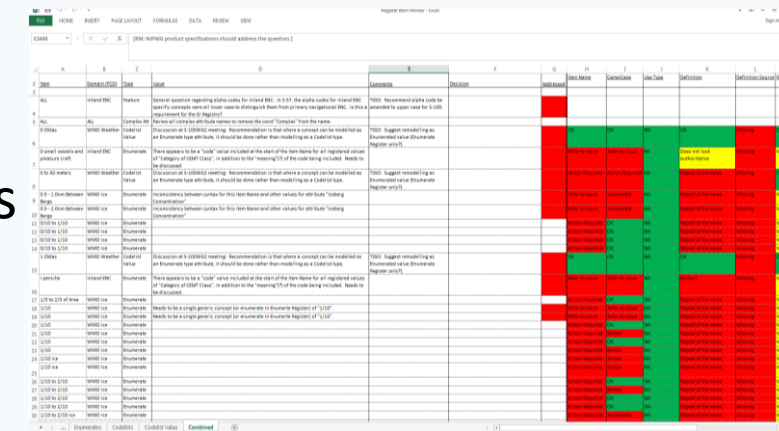


- IHO/HSSC will not create or control definitions or standards outside its scope
  - But it can help and advise if asked ...

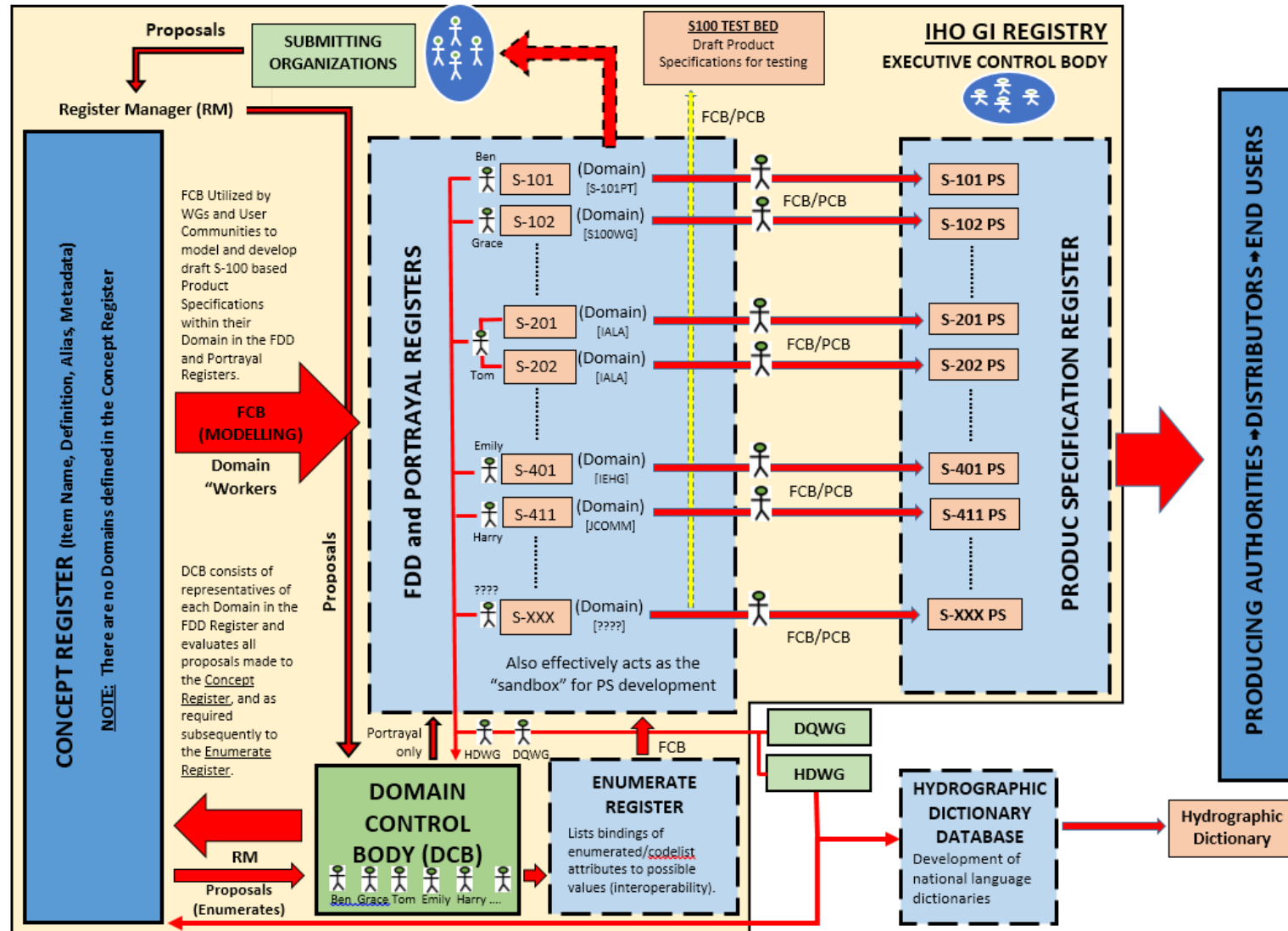


# Ongoing Development

- Implement a “true” Concept Register
  - Subsequent possible restructure of the FCD Register
  - Introduction of “Enumerate” and “Codelist” Registers
- Review current content of the FCD Register
  - Likely impact on PS in development
- Draft Guidelines and Conventions document for Register content and Registry users
  - Proposers, Control Bodies, PS developers
- Connection and establish relationship with Hydrographic Dictionary database
- Review of S-99

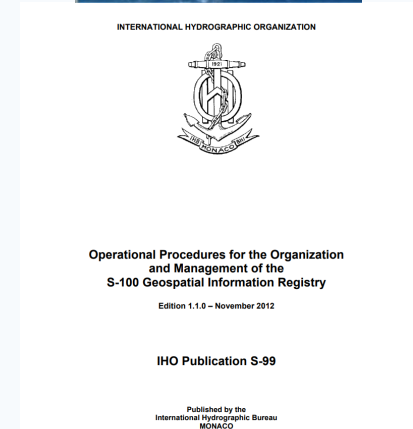
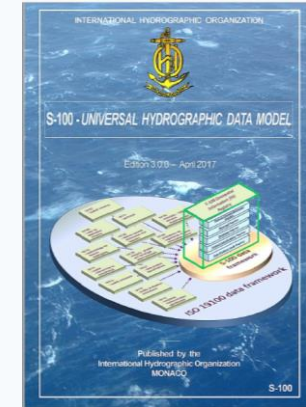


# Ongoing Development



# S-100 References

- S-100 - Universal Hydrographic Data Model  
Edition 3.0.0 – April 2017
- S-99 - Operational Procedures for the Organization  
and Management of the S-100 Geospatial  
Information Registry  
Edition 1.1.0 - November 2012
- S-100 on-line GI Registry: <http://registry.iho.int/>



# Questions?

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For more information: <https://www.iho.int>  
IHO Secretariat Contact: [jeff.wootton@iho.int](mailto:jeff.wootton@iho.int)

