

## Paper for Consideration by S-100WG 2

### [Restructuring of the S-100 Registry]

<b>Submitted by:</b>	NIPWG
<b>Executive Summary:</b>	An outline for an enhancement of the S-100 registry taking into account the adoption of S-100 as the basis of the Common Marine Data Structure by the IMO
<b>Related Documents:</b>	S-100, S-99, MSC94/18/8)
<b>Related Projects:</b>	

#### Introduction / Background

Among administrative entries, the S-100 registry is designated to host various GI registers:

- The Feature Concept Dictionary registers,
- Portrayal,
- Meta data,
- Data Producer Codes, and
- Product Specifications.

The Feature Concept Dictionary contains hydrographic geospatial information in terms of feature, attributes, code lists, enumerates and information types in various domains.

The S-99 specification contains the administrative operational procedures for the organization and management of the S-100 Geospatial Information Registry.

The IMO introduced the Common Marine Data Infrastructure (CMDS) and confirmed at MSC94 that the CMDS should be based on the S-100 framework. That would justify the need of a registry which could be used for IMO purposes as well.

#### Analysis/Discussion

The current structure of the S-100 FCD registers is domain related. It is expected that the more the S-100 framework attracts more marine stakeholder which are acting under the IMO CMDS the more domains will be created. That results in an increased administrative burden for the registry operation.

The domain related structure means in practice that each Domain Owner is responsible for the items which are in the scope of their respective domain. S-99 states that each new submission to the FCD should be agreed by each Domain Control Body Member, independently whether they are familiar with the topic of the submission or not.

One criterion for not accepting proposals is that “an identical or very similar item already exists in the Register or in another Register in the Registry”. That procedure never experienced a proof of concept and it is rather unlikely that a proof will be successful if a large amount of submissions will be made and each individual item requires adoption.

Rather, it is likely that the various FCD domains will contain:

- the same information stored in different FCD domains with slightly different definitions and camelCase,
- similar camelCase in different FCD domains with different definition(s), and
- duplicated FCD items.

Consequently, the GI register is likely to contain redundant and inconsistent information in the future and it is anticipated that the registry will become untidy and unreliable.

A way to avoid the said inadequacies would be the provision of domain-agnostic storage of FCD entries by introducing an additional common domain for the storage for FCD entries which could be used by different domains and name spaces for each item.

The introduction of an additional domain is in line with section 2.1.1 of the S-99 which states that the Register Manager may propose a new domain depending on the need of the Register.

An interim solution could be the introduction of a software based test for new registry entries checking definitions, camelCases etc. However, this software tests would not solve the context depended concepts of new FCD entries.

Example:

The attribute “status” and the respective enumerates may have different meaning(s) in other product than in the S-101.

That can either result in a situation that the submitting Domain Owners search for alternative terms of the various values which might not fit their intention 100% or that the owner of the attribute “status” has to negotiate with submitting Domain Owners and that could result in a downgrade of the intended meaning.

According to various sources is the definition of STATUS

S-101	merriam-webster.com/dictionary	Dictionary.com
Not provided in the S-101 baseline version (2014)	a : position or rank in relation to others <the status of a father> b : relative rank in a hierarchy of prestige; especially : high prestige the condition of a person or thing in the eyes of the law the state or condition with respect to circumstances <the status of the negotiations>	1. the position of an individual in relation to another or others, especially in regard to social or professional standing. 2. state or condition of affairs: 3. Law. the standing of a person before the law.

Some usages of “status” and terms derived from it, found in relevant prior or ongoing projects:

Term	Product specification, domain, or source	Definition and values
status	S-101	Definition not provided in baseline DCEG. Values: 19 listed values of different types covering for example ownership, permanence, illumination, etc.
status	World Database on Protected Areas	Conservation status. Values: Designated, Adopted, Proposed
status	Route Exchange (MonaLisa 2.0 draft)	Status: The status of a route (leg) Values: Mandatory, Optional
Route_Status	(as above)	Status indication of a route Values: Original; Planned for voyage; Optimized; Recommended and/or Traffic Coordinated; Safety Checked; Approved; Used for monitoring
operatingStatus	Marine Spatial Planning	Whether the facility is operational or under construction. Merges Hydrocarbon Extraction and wind farm operational status lists. Values: Active; Abandoned; Suspended; Operational; Under construction; Other operational status; unknown operational status. the first 3 and last 2 are for HE, the 4 <sup>th</sup> and 5 <sup>th</sup> for wind farms.
statusOfAtoN	AIS demonstration project (c. 2012), Message 21	A complex attribute modelling IALA Recommendation A-126. Contains 4 sub-fields including RACONStatus, lightStatus, and healthOfAtoN.

The domain-agnostic storage in a common domain would allow to model and to store the data independently of their use and it would underline that the data of this domain have commonalities in their use and meanings. In addition, the name space would allow a greater flexibility in using the data from that common domain in different product specifications. Minor modifications are possible depending on the purpose, e.g. in the definitions, or by using a subset or an extended list of allowed values in one domain compared to the common domain, or different constraints, etc.

A name space is an additional identifier attached to a FCD entry which can be employed to separate different meanings or definitions if using the same term.

Assuming two domains wish to use the term “communicationChannel” for their product specification. One domain uses the definition “xxxxx” and the other domain uses a slightly extended definition “xxxxx”. Instead of starting

the negotiation on a common definition which might not be successfully achievable, the two domains use the term "communicationChannel" with an additional name space: "communicationChannel.hydro" or "communicationChannel.npub". Both definitions could retain with different content and a product specification employs either the one or the other.

The implication of that name space approach should be discussed once the establishment has been agreed on.

It would also support the CMDS and each item related to that could be easily incorporated in either a specific domain or in the common domain.

The several entries can be stored in a way that they would be suitable for different requirements and the product specification may use the full set or sub sets of the entries relevant for their purpose.

Processes for moving items from their origin domain to the common domain and to extend the camelCase by name spaces are desirable for those items which are stored in one particular domain and which become useful for other domains.

### **Recommendations**

The agnostic data storage in a common domain and the introduction of name spaces should be discussed as an option to improve the registry performance and as a simplified access to FCD items which could be used and stored in different domains.

### **Justification and Impacts**

A revision of the relevant S-100 and S-99 parts would be necessary. It is expected that this might cause a significant workload during the transition phase.

After completion, the handling of the S-100 registry and the access to the data would be simplified.

### **Action Required of [S-100WG]**

The [S-100WG] is invited to:

- a. note this paper,
- b. consider the proposal and to take actions as appropriate.