**17th TSMAD MEETING**

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Paper for Consideration by CHRIS

# Governance and Management Arrangements for the IHO Information Registry

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| *Submitted by:* | IHB, Chairman TSMAD |
| *Executive Summary:* | This paper seeks endorsement of the management arrangements for the IHO Geospatial Information Infrastructure Registry and the consequential impacts on IHO resources. |
| *Related Documents:* | *S-100 Information Paper – May 2008* |
| *Related Projects:* | IHO Work Programme – *Element 3- Techniques and Standards Coordination and Support* |

## Introduction / Background

S-100 has been developed to become the recognised comprehensive Geospatial Standard for Hydrographic Data. It is modelled and aligned with the ISO 19100 series of geographic information standards. The establishment, maintenance and extension of S-100 will rely on a comprehensive web-based registry, owned and managed by the IHO. The supporting organisational framework behind the standard is now beginning to take shape. As the owner of the standard the IHO has the important role of ensuring that an efficient and reliable governance and management framework is in place to support S-100.

## Analysis/Discussion

S-100 Management and Governance Framework

S-100 must be supported by an organisational and governance framework that involves all the stakeholder groups. The IHO is the principal sponsor of the standard and will have overall control of the standard and its maintenance.

## Benefits of a Registry

The establishment of an IHO Geospatial Information Infrastructure Registry (IHO GII Registry) has been chosen because it provides particular flexibility in accommodating unpredictable changes and the introduction of new requirements at relatively short-notice, as often occurs in hydrography and associated high-technology applications. In hydrographic charting this includes such things as new navigational features, specially designated areas and boundaries. It will be possible to implement such things much quicker than previously under S-57.

No registered item is ever removed from any of the S-100 Registers; items will always exist – in one of four states:

- Invalid – item which is proposed but not accepted or no longer acceptable

- Valid – latest version of an item

- Superseded – previous version/s of a valid item

- Retired – item no longer recommended for use.

This means that there will be no need for immediate consequential changes or upgrades to existing Product Specifications whenever a revision is made in a Register to which the Product Specification refers. In S-57 such changes are required, and this usually results in expensive and time consuming changes to equipment or software that rely on a particular Product Specification. This is particularly the case for ENCs based on S-57 and is the reason why S-57 and the ENC Product Specification have been, in effect, frozen for some time.

Each Register provides a basis for the flexible management of domain specific feature and attribute collections. The IHO – for example, will own Registers for source chart data such as bathymetry, tidal information, chart information and nautical publications. Other owners, such as delegates of the World Meteorological Organization (WMO) will own the Register dealing with data for Sea Ice Reporting; the International Association of Lighthouse Authorities (IALA) may own Registers dealing with collections of Features and Feature Attributes relating to the operational status of aids to navigation.

**The IHO Geospatial Information Infrastructure Registry**

This conforms to ISO 19135 (Geographic information — Procedures for item registration) and uses a hierarchical structure of a register and sub-registers as illustrated in the following diagram.
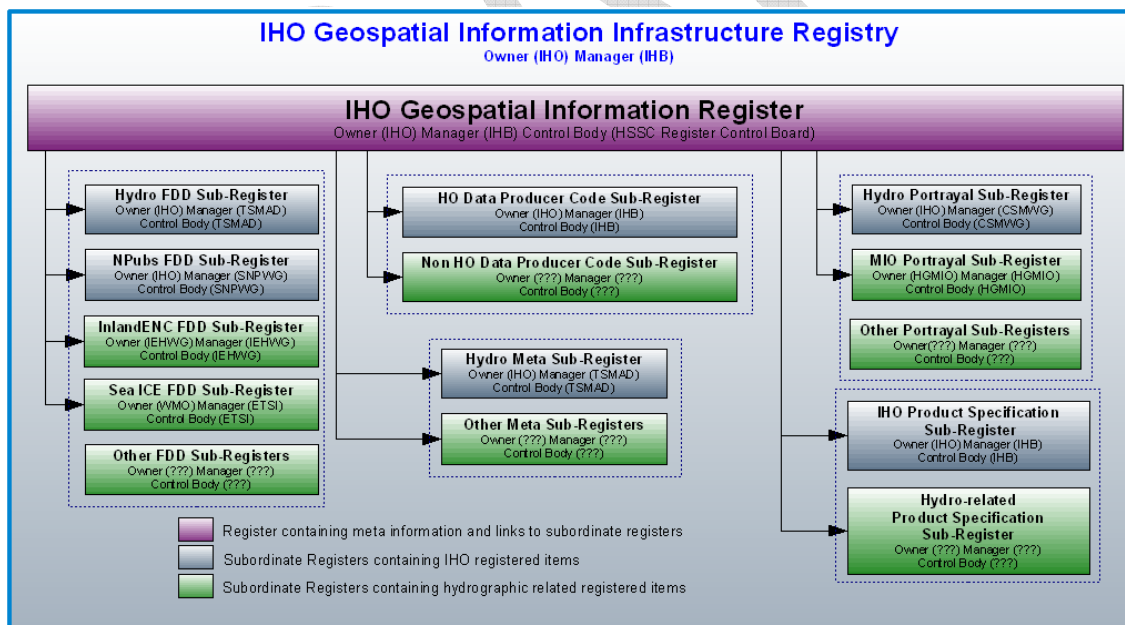


Figure 1 - IHO Geospatial Information Infrastructure Registry

A registry is the information system on which a register is maintained, and a register is simply a managed list. The IHO Geospatial Information Infrastructure Registry has been set up to operate through a web-enabled registry engine and database that houses component Registers and Sub-Registers. The IHO registry interface is currently located at:

http://195.217.61.120/iho_registry/. At present it is only servicing the feature data dictionary registers, but will eventually be expanded to fulfill all GII requirements.

A Similar arrangement is being used by the Digital Geospatial Information Working Group (DGIWG), the DGIWG Feature and Attribute Data Registry is located at https://www.dgiwg.org/FAD/

**Roles and responsibilities required to manage a registry** For information purposes, a condensed version of the S-100 registry management component is reproduced in Annex B.

## Content of the IHO Geospatial Information Infrastructure Registry

As can be seen in Figure 1 the registry consists of an overarching register which contains meta information about its subordinate registers.
There are five basic types of sub-register:

- Feature Data Dictionaries
- Portrayal
- Meta Data
- Data Producer Codes
- Product Specifications

The first four sub-registers will contain actual data items, the product specification sub-register will contain meta information e.g. title, version, owner, contact address etc. and potentially a link to where a copy of the product specification can be located.

In addition to this structure it is proposed that the sub-registers will be classified as either being official hydrographic sub-registers owned by the IHO or hydrographic related sub-registers owned by appropriate organisations.

The Sub-Registers owned by the IHO should be confined to those that directly support the official hydrographic products and services required to meet the chart and publications carriage requirements of the Convention on the Safety of Life at Sea (SOLAS).

At the same time, other Sub-Registers that can be shown to complement marine navigation or support the activities of national hydrographic authorities can be established in the Registry by the relevant organizations. This could be for such things as Inland ECDIS services, sea ice reports, maritime weather services, and vessel traffic information. In these cases, the relevant competent authority or organisation would control the Register within the rules and procedures of the IHO Geospatial Information Registry as a whole, and would have control over the compilation and maintenance of their Registers and any Product Specifications that they may wish to derive. This is already happening with Inland ENC (owner IEHWG), ICE (owner WMO(ETSI).

**Allocation of Sub-Registers.** The criteria for determining both the allocation of Sub-Register Owners and the authorization of Product Specifications are proposed to be as follows:

**IHO Sub-Registers** include S-100 features and feature attributes required directly or indirectly to support official hydrographic products and services required to meet SOLAS carriage requirements as provided by national hydrographic authorities under the guidelines and specifications of the IHO. These Sub-Registers and Product Specifications will normally

be hosted by the IHO in the Registry and maintained by a relevant IHO body. The Product specifications to be authorised by the IHO, would then use the numbering series S-101 to S-149.

> Examples:  ENC, Official Nautical Publications, Source bathymetry

**Hydro-Related Sub-Registries and Product Specifications** include S-100 features and feature attributes that complement marine navigation and support the activities of national hydrographic authorities but are not required to meet the SOLAS obligations of national hydrographic authorities. These Sub-Registers may be hosted by the IHO in the Geospatial Information Registry but will be maintained by the relevant non-IHO competent authority. Any Product specifications will be authorised by the relevant non-IHO competent authority and, subject to further consideration, might then use the numbering series S-151 to S-199.

> Examples:  InlandENC, Dynamic Ice Coverage, Marine weather/climate, Additional Military Layers, Vessel traffic information

**Other Sub-Registers and Product Specifications** not included in the Registry include S-100 features and feature attributes with marginal or no relationships with the primary marine navigation roles of national hydrographic authorities. Any Sub-Registers and Product Specifications for these would normally be organised, authorised and maintained by the appropriate non-IHO competent authorities under their own Registry arrangements; for example, in other ISO19100 Registries. The numbering convention for Product Specifications ought to be distinguishable from the S-1xx series.

> Examples:  Maritime Spatial Data Infrastructure (MSDI), Oil and Gas Industry applications, Coastal Zone/Littoral Management.


**Specific issues relating to the roles and responsibilities of the IHO Geospatial Information Infrastructure Registry as detailed in Annex A.**


**Registry and Register Managers**. The roles and responsibilities of the IHO Geospatial Information Infrastructure Registry Manager and the IHO Geospatial Information Register Manager can be performed by the same person. Although part time, the task will be ongoing, and will, however, require the regular and consistent attention of dedicated personnel, perhaps for up to two days per week. It is unlikely that Member States would have the resources to undertake this role on behalf of the IHO. The International Hydrographic Bureau or contracted personnel are therefore the most appropriate to fulfil this role, however, there are some resource issues that need to be considered.


**Register Owner and Control Body**..

The responsibilities and obligations of the IHO as the IHO Geospatial Information Register Owner will be undertaken by a Register Control Board. The IHO Hydrographic Services and Standards Committee (HSSC) is the most appropriate body to fulfil this role.


A key element in the management and maintenance of a coherent IHO Geospatial Information Register is coordination between the Sub-Register Managers to ensure that there is consistency between the sub- Registers. A particularly important coordination function will be in deciding whether new proposals for input to a particular sub- Register are appropriate or

relevant. For most cases this will be obvious and an initial determination by the sub- Register Manager , will be correct. However, where there is doubt, the sub-Register Control Body appointed by the Register Owner should provide direction to the sub-Register Manager. The sub-register Control Body should also advise on the acceptability of proposals for changes and additions to the content of a Register.

In cases where a suitable sub-Register cannot be identified through consultation between sub-Register Managers, it may ultimately require a decision from the IHO Geospatial Information Register Control Body.

**GII Management and Administration**

The management and administration of the IHO Geospatial Information Register must be conducted through a hierarchy of Owners, Managers and Submitting Organisations.

In the IHO, a number of existing technical Working Groups (WG) will be Sub-Register Owners. For example, the Transfer Standards and Maintenance Development WG (TSMAD) are effectively the Register Owners of the IHO Hydrographic Register. The Inland ECDIS Harmonization Group (IEHG) are owners of the Inland ENC Register. There is also a provisional register in place for the transferral of items presently manage by  the Open ECDIS Forum.

A Sub-Register Manager will be appointed by the sub-register owner.

A Sub-Register Control Body will be appointed by the sub-register owner.

**Recommendations**

It is recommended that:

the existing and proposed management arrangements for the IHO Geospatial Information Registry be endorsed by CHRIS, and in particular, that:

the HSSC assumes the role of the IHO Geospatial Information Register Control Body

the IHB assumes responsibility for the function of the IHO Geospatial Information Registry Manager and the IHO Geospatial Information Register Manager roles.

**Justification and Impacts**

As described earlier, a robust management, organisational and governance framework is fundamental to the success of S-100. This framework is destined to become a cornerstone of IHO activity. As such, it demands appropriate resources be allocated.

In particular, the role of the IHO Registry Manager can be seen as a new task that does not replace an existing activity. In the short term, it may be possible for existing IHO Staff and secondees to take on this role. However, as the workload will increase over time when the use of the IHO Geospatial Information Registry increases, consideration will need to be given to seeking suitable dedicated secondments from Member States, or increasing the IHB staff, or engaging suitably experienced personnel under contract payment. The last two options will obviously result in increased expenditure to the Organization.

**Action Required of CHRIS**

The CHRIS is invited to:

a.  **endorse** the existing and proposed management arrangements for the IHO S-100 Registry

b.  **agree** that the HSSC assumes the role of Registry Control Body

c.  **agree** the IHB assumes responsibility for the function of Registry Manager

d.  **agree** the guidelines and principles for the management of the IHO Registry at Annex A

e.  **agree** that Registers owned by the IHO should be confined to those that directly support the official hydrographic products and services required to meet the chart and publications carriage requirements of the Convention on the Safety of Life at Sea (SOLAS).

f.  **invite** the IHB to consider and report on how best to resource the on-going function of IHO Geospatial Information Registry Manager.

## Guidelines and Principles for the Management of the IHO Geospatial Information Infrastructure Registry

1. The IHO Geospatial Information Infrastructure Registry Owner shall be the IHO.

2. The duties of IHO Geospatial Information Infrastructure Registry Manager shall be the responsibility of the IHB. The principle roles of the manager shall be to:

    - Routine maintenance of the registry system and infrastructure.

    - Management of the interface and databases including the provision for adding new registers.

    - Maintaining the system security and data backup functionality.

3. The IHO Geospatial Information Register Owner shall be the IHO.

4. The duties of IHO Geospatial Information Register Manager shall be the responsibility of the IHB. The principle roles of the manager shall include:

    - Provide Registry access for Sub-Register Managers, Control Bodies, and Sub-Register Users.

    - Ensure that information about items in the Sub-Registers is readily available to users with regard to those items that are valid, superseded, or retired.

    - Receive proposals for input to the various Sub-Registers in the Registry and forwarding them to all Register Managers.

    - Nominate an appropriate Register for proposals for input in consultation with the relevant Sub-Register Managers.

5. The IHO Geospatial Information Register Control Body shall be the HSSC Registry Control Board. The principle roles of the IHO Geospatial Information Register Control Body will be to:

    - Ensure the effective functioning of the IHO Geospatial Information Register and its sub-registers.

    - Control the management of resources required for the establishment and maintenance of IHO Sub-Registers.

    - Approve the setting up or reorganisation of IHO Sub-Registers.

    - Adjudicate on applications for new, hydro-related sub-registers

    - Consider and decide upon proposals from subordinate management bodies of the Geospatial Information Register.

- Adjudicate on appeals when any proposal has been rejected by register control body/ies. Nominate an appropriate Sub-Register for proposals when this has not been resolved by a Registry Manager in consultation with other relevant Register Managers.

6. The membership of IHO Sub-Register Control Bodies shall be at the discretion of the Sub-Register Owners.

7. Submitting Organization membership to IHO Sub-Registers shall consist of one person nominated by, and an employee of, an official Member State Hydrographic Office.

8. Submitting Organization membership to any hydrographic related Sub-Register is at the discretion of the Sub-Register owner.

**Annex B**

## Roles and responsibilities of managing a registry.

**Registry Owner.** (S-100 Part 11) The Registry Owner is the organization that is responsible for the registry. It has the authority to host the registers and establish the policy for access.

**Registry Manager.** (S-100 Part 11) A Registry Manager will be appointed and be responsible for monitoring and maintaining the day-to-day operation of the Registry. This includes:

- Provide Registry access for Register Managers, Control Bodies, and Register Users;

- Ensure that information about items in the Registers is readily available to users with regard to those items that are valid, superseded, or retired;

- Receive proposals for input to the various Registers in the Registry and forwarding them to all Register Managers; and

- Nominate an appropriate Register for proposals for input in consultation with the relevant Register Managers.

- Process applications for the establishment of new registers with approval of the registry owner.

**Register Owner.** (S-100 Part 11) Each established Register has a Register Owner. A Register Owner is an organization that:

- Establishes one or more Registers.

- Has primary responsibility for the management, dissemination, and intellectual content of its Registers.

- May appoint another organization to serve as the Register Manager.

- Shall establish a procedure to process proposals and appeals made by Submitting Organizations.

**Register Manager.** (S-100 Part 11) Register Owners will appoint a Register Manager for their Registers. A Register Manager is responsible for the administration of a Register. This includes:

- coordinating with other Register Managers, Submitting Organizations, the related Control Body, Register Owner and the Registry Manager to ensure entries are being compiled in the appropriate Register

- maintaining items within the Register

- maintaining and publishing a list of Submitting Organizations

- distributing an information package containing a description of the Register and how to submit proposals

- providing periodic reports to the Register Owner and/or the Control Body. Each report will describe the proposals received and the decisions taken since the last report. The interval between those reports would normally not exceed 12 months

A Register Manager may manage multiple Registers.

**Register Control Body.** (S-100 Part 11) A Control Body is a group of technical experts appointed by a Register Owner to decide on the acceptability of proposals for changes to the content of a Register. The Control Body must comprise of experts in the related field that makes up the contents of the Register that they control.

**Submission of Proposals.** (S-100 Part 11) Submissions and proposals to be included in any part of the Registry will normally come from recognised competent organisations that are qualified under criteria determined by the relevant Register owner to propose changes to the existing content of a Register. The Register Manager will normally determine whether a Submitting Organization is qualified in accordance with the criteria established by the Register Owner.

Register Managers will consider whether a proposed item is suitable for the Register in which it is proposed to reside. The Control Body for that Register is the approving authority. If inclusion in a Register is not approved, the proposer will be informed. Disputed decisions may then be forwarded to the Registry Board by the Registry Manager for resolution.

It is open to a Submitting Organization to develop submissions of proposals for registration according to their respective communities or organizations. However, proposed changes to an IHO Register must then meet the submission procedures established by the Register Owner. These are included in the S-100 documentation.