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Paper for Consideration by CHRIS

**Governance and Management Arrangements for the IHO Information Registry**

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

### **Introduction / Background**

1. 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 and relies on an IHO Geospatial Information Infrastructure (GII) Registry using a hierarchical structure of a register and subordinate registers which are established as required. The existing IHO geospatial standards, such as S-57 and S-52 are effectively part of the GII Registry. The establishment, maintenance and extension of S-100 relies on a comprehensive web-based registry database, 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.
2. An overview description of the S-100 Register functions, including the numbering convention for S-100-based product specifications is contained at Annex A.

### **S-100 Registers - Roles and Responsibilities**

#### GII Management and Administration

3. The management and administration of the IHO Geospatial Information (GI) Register is conducted through a hierarchy of Owners, Control Bodies, Managers, and Submitting Organisations.
4. Register Owners Each register is owned by an appropriate authority and has overall control of its subordinate organisations in the GII. Register owners appoint register managers and register control bodies. A number of existing technical Working Groups (WG) are already register owners. For example, the Transfer Standards and Maintenance Development WG (TSMAD) is effectively the register owner of the Hydro FCD Register. The Inland ECDIS Harmonization Group (IEHG) is the owner of the Inland ENC FCD Register. There is also a provisional register in place for the transferral of items presently managed by the Open ECDIS Forum.

5. Control Bodies 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. The Hydrographic Services and Standards Committee (HSSC) should take on the ultimate responsibility and obligation for the GII as its top-level owner, by acting as the register control board for the S-100 GI Register.

6. Register Managers Register Managers are responsible for the day-to-day management of the registers that fall under their control. A key element in the management and maintenance of a coherent S-100 GI Register will be the coordination between the various register managers to ensure that there is consistency between the registers. A particularly important coordination function will be in deciding whether new proposals for input to a particular register are appropriate or relevant. For most cases this will be obvious and an initial determination by the register manager will be correct. However, where there is doubt, the register control body appointed by the register owner must provide direction to a register manager. The register control body should also advise on the acceptability of proposals for changes or additions to the content of its register.

7. In cases where a suitable register cannot be identified through consultation between register managers, it may ultimately require a decision from the S-100 GI Register Control Body.

8. Submitting Organisations Submitting Organisations are recognized bodies that can make proposals to further develop, amend or supersede the relevant elements of the S-100 standard.

9. Registry Manager In addition to the various register managers, there is a requirement for a GII Registry Manager whose role is to manage and maintain the IT infrastructure that supports the IHO GII.

10. More information on the roles of owners, control bodies, managers, and submitting organisations is contained at Annex B.

11. Further detailed requirements for the management of a registry are contained in Annex C.

## **Resources**

12. The functions of the IHO GII Registry Manager and the S-100 GI Register Manager are vital tasks in the successful operation of the GII. They can be performed by the same person and could be performed remotely. Although part time, the task will be ongoing, and will require the regular and constant attention of dedicated personnel, for up to two days per week.

13. It may be possible to reallocate or reorganise certain duties amongst IHB staff in the longer term but in the short term (until at least 2010), it is not possible for the IHB to absorb the additional tasks of GII Registry Manager and S-100 Register Manager from within current resources. It seems unlikely that Member States will have the resources to undertake these roles on behalf of the IHO. As a result, it will be necessary to seek suitable dedicated secondments from Member States, or increasing the IHB staff, or engage suitably experienced personnel under contract payment. The IHB or contracted personnel reporting to the IHB are therefore the most appropriate to fulfil this role; however, there are some resource issues that must be considered.

## Impact

14. The establishment of S-100 has been very well received by stakeholders and is awaited with enthusiasm. In particular, the fact that non-IHO bodies will have a positive role in the development and extension of S-100 has been very enthusiastically welcomed. 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. Failure to do so will have serious consequences for the viability of S-100 as a standard and will reflect badly on the reputation of the IHO.

15. The infrastructure support required for S-100 and the GII can be seen as new tasks that do not replace any existing activity. In particular, the roles of GII Registry Manager and S-100 Register Manager are both new and vital. Consideration may be given to seeking suitable dedicated secondments from Member States, or by increasing the IHB staff, or by engaging suitably experienced personnel under contract payment. The last two options will obviously result in new expenditure for the Organization.

## Action Required of CHRIS

16. The CHRIS is invited to:

- a. **Endorse** the existing and proposed management arrangements for the IHO S-100 Geospatial Information Registry as reflected in Annexes A, B and C.
- b. **Agree** that the HSSC assumes the role of S-100 Geospatial Information Registry Control Body.
- c. **Decide** how the functions of IHO Registry and S-100 Geospatial Information Register Manager can be fulfilled and **if necessary** seek MS approval to fulfil this role by contractor until such time as more permanent arrangements can be put into place.

## The IHO Geospatial Information Infrastructure Registry

1. The IHO Geospatial Information Infrastructure (GII) Registry conforms to ISO 19135 - *Geographic information — Procedures for Item Registration* and uses a hierarchical structure of a register and subordinate registers which are established as required. 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/>
2. The IHO S-100 Geospatial Information Register is the primary register in the GII Registry and has overarching control over its subordinate registers. The following diagram illustrates the structure of the IHO GII Register.

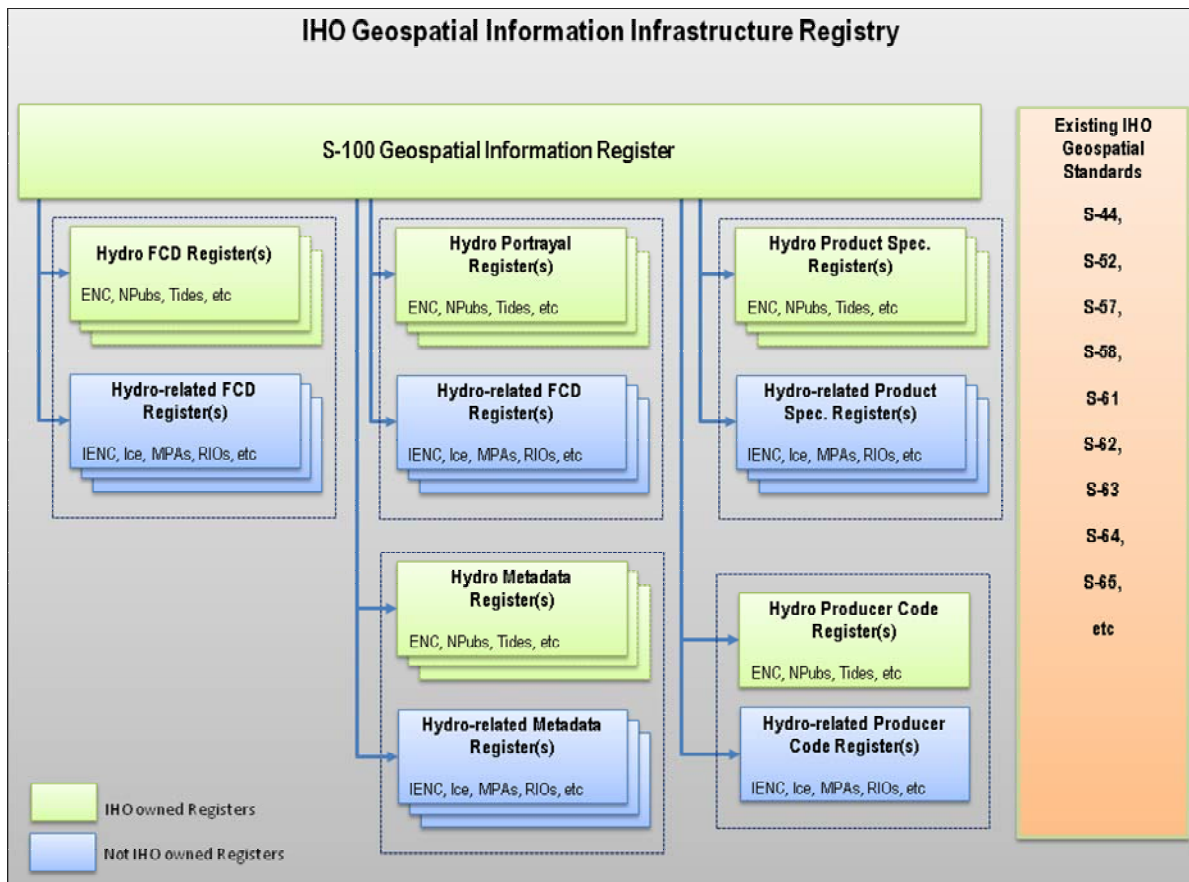


Figure 1 - IHO Geospatial Information Infrastructure Registry

3. A registry is the information system on which a register is maintained; 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. The IHO GII registry interface is currently located at: [http://195.217.61.120/iho\\_registry/](http://195.217.61.120/iho_registry/). At present it is only servicing the S-100 feature concept dictionary (FCD) registers, but will eventually be expanded to fulfil all GII requirements. The current status of the IHO GII Registry, showing the relevant Managers and Control Bodies is shown in Figure 2.

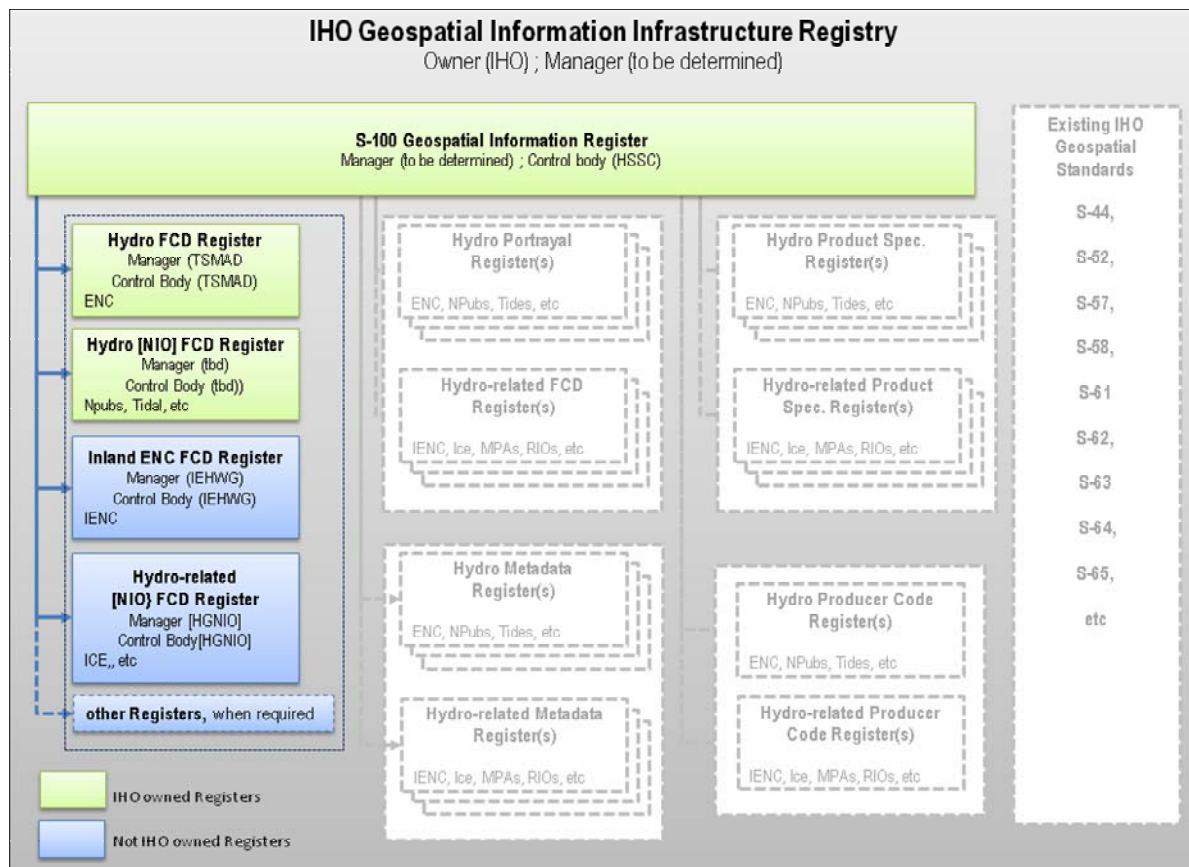


Figure 2 – Current Status of IHO Geospatial Information Infrastructure Registry

### Benefits of a Registry

4. 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 the introduction of new navigational features such as specially designated areas and boundaries. It will be possible to implement these things much more quickly than previously under S-57.

5. 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*

6. 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 relies on a particular product specification. This is particularly the case for ENC's based on S-57 and is the reason why S-57 and the ENC product specification have been, in effect, frozen for some time.

## Content of the IHO Geospatial Information Infrastructure Registry

7. 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 register domains:

- Feature Concept Dictionaries (FCD)
- Portrayal
- Meta Data
- Data Producer Codes
- Product Specifications

8. The first four registers contain actual data items, the product specification register contains 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.

9. Registers will be classified as either being official hydrographic registers owned by the IHO, or hydrographic-related registers owned by appropriate organisations, which in most cases will be non-IHO organizations.

10. The registers owned by the IHO will normally 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).

11. At the same time, other registers that can be shown to complement marine navigation or support the activities of national hydrographic authorities can be established in the IHO S-100 Geospatial Information Registry by relevant organizations and groups. 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 relevant register within the rules and procedures of the IHO Geospatial Information Registry as a whole. They 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), and Ice Reports (owner WMO-ETSI).

12. **Allocation of Registers.** The criteria for determining both the allocation of register owners and the authorization of product specifications are proposed to be as follows:

13. IHO 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 registers and product specifications will normally be hosted by the IHO in the IHO Geospatial Information Registry and maintained by a relevant IHO body. The product specifications to be authorised by the IHO, would then use the numbering series S-1xx beginning with S-101 for the S-100-based ENC.

Examples: ENC, Official Nautical Publications, Source bathymetry

14. Hydro-Related Registers 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 Registers may be hosted by the IHO in the Geospatial Information Registry but will be owned, maintained and authorised by a relevant non-IHO competent authority. As these Product specifications will not be authorised by the IHO they

should use a numbering series that is not associated with or can be confused with the IHO S-1xx series.

Potential Applications: Inland ENC, Dynamic Ice Coverage, Marine weather/climate,  
Additional Military Layers, Vessel traffic information

15. Other Registers and Product Specifications not included in the IHO Geospatial Information Registry, include S-100 features and feature attributes with marginal or no relationships with the primary marine navigation roles of national hydrographic authorities. Any 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 ISO 19100 registries. As these Product specifications will not be authorised by the IHO and will not even be part of the IHO GII, they should use a numbering series that is not associated with or can be confused with the IHO S-1xx series.

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

## **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:
  - Routine maintenance of the S-100 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 S-100 Geospatial Information Register Owner shall be the IHO.
4. The duties of S-100 Geospatial Information Register Manager shall be the responsibility of the IHB. The principle roles of the manager shall include:
  - 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.
  - Nominate an appropriate register for proposals for input in consultation with the relevant register managers.
5. The S-100 Geospatial Information Register Control Body shall be the HSSC. The principle roles of the S-100 Geospatial Information Register Control Body will be to:
  - Ensure the effective functioning of the S-100 Geospatial Information Register and its registers.
  - Control the management of resources required for the establishment and maintenance of IHO-owned registers.
  - Approve the setting up or reorganisation of IHO-owned registers.
  - Adjudicate on applications for new, hydro-related registers.
  - Consider and decide upon proposals from subordinate management bodies of the S-100 Geospatial Information Register.
  - Adjudicate on appeals when any proposal has been rejected by subordinate register control body/ies. Nominate an appropriate register for proposals when this has not been resolved by a registry manager in consultation with other relevant register managers.
6. The membership of Register Control Bodies shall be at the discretion of the register owners.
7. Submitting Organizations for IHO-owned registers shall be representatives of IHO Member States as nominated by that Member State.



8. Submitting Organizations for hydrographic related registers shall be determined by the register owner.

## **Roles and Responsibilities of Managing the IHO Geospatial Infrastructure Registry**

1. **Registry Owner.** (S-100 Part 11) The registry owner is the HSSC, which is responsible for the registry. It has the authority to host a register(s) and establish the policies for access.
2. **Registry Manager.** (S-100 Part 11) The registry manager will be appointed by the IHO and be responsible for monitoring and maintaining the day-to-day operation of the registry. This includes:
  - Providing registry access for register managers, control bodies, and register users;
  - Ensuring that information about items in the subordinate registers is readily available to users with regard to those items that are valid, superseded, or retired;
  - Receiving proposals for input to the various registers in the registry and forwarding them to all register managers; and
  - Nominating an appropriate register for proposals for input in consultation with the relevant register managers.
  - Processing applications for the establishment of new registers with approval of the registry owner.
3. **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.
4. **Register Manager.** (S-100 Part 11) Register owners will appoint a register manager for their register(s). 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
5. A register manager may manage multiple registers.

6. **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.

7. **Submission of Proposals.** (S-100 Part 11) 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.

8. 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.

9. 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 procedures are included in the S-100 documentation.