**CHRIS17-12.2A**

**Paper for Consideration by CHRIS**

**Cooperation Agreement Between IHO and DGIWG**

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| ***Submitted by:*** | IHB |
| ***Executive Summary:*** | The IHO standards for digital hydrographic information and the Digital Geographic Information Working Group (DGIWG) standards for digital geospatial information were developed at about the same time from slightly different perspectives. Hence, there are differences in how these two sets of standards encode and portray hydrographic information. Since the adoption of these standards the IHO and DGIWG have been working together to harmonize the two sets of standards. This submission requests CHRIS review, comment on and endorse, with changes as necessary, the Draft Cooperation Agreement Between the IHO and the DGIWG. |
| ***Related Documents:*** | Draft Cooperation Agreement Between the IHO and the DGIWG (attached).<br><br>DGIWG/IHO Statement of Intent dated 29 March 1994 |
| ***Related Projects:*** | S-57 edition 4 |

**Introduction / Background**

DGIWG and IHO have a long history of cooperation, and have previously established a cooperative agreement that led to inclusion of common spatial schema and other common components in previous editions of the IHO and DGIWG standards. This cooperative agreement increases the level of cooperation and replaces any previous agreements.

The IHO and DGIWG have been involved in the parallel development of standards for the exchange of Digital Geospatial Information and specifications for digital geospatial (including hydrographic) products.

The IHO has produced S-57, a transfer standard for digital hydrographic information, for use for navigational and non-navigational purposes, and a product specification for ENC (Electronic Navigational Chart) for use in ECDIS (Electronic Chart Display and Information Systems).

DGIWG has produced DIGEST, a collection of fundamental standards for digital geospatial information, which are used as the baseline for product specifications for defence purposes such as DNC (Digital Nautical Chart) and the various levels of VMAP (Vector Map).

Both organisations are working on development of their existing standards. IHO is developing the S-57 Edition 4.0 and DGIWG is developing a suite of geospatial information standards in accordance with the DGIWG Technical Vision and Development Strategy (TVDS). Both are aligning their work with that of the ISO Technical Committee on Geographic Information/Geomatics, TC211. Both are also cooperating with NATO Geospatial Maritime Working Group in support of the standardization of a suite of Additional Military Layers (AMLs) which are intended to work together with data products produced in compliance with either or both the IHO and DGIWG geospatial standards.

The purpose of the Cooperation Agreement is to establish an understanding between the IHO and DGIWG. It formalizes the intention of the IHO and DGIWG to co-operate to harmonize the development of their respective standards for Digital Geospatial Information.

**Analysis/Discussion**

Achieving the greatest degree of uniformity in standards for the exchange of digital hydrographic data and specifications for digital hydrographic products is an explicit objective of the IHO.

The development and maintenance of standards and their harmonization with similar international standards is part of the existing work programme of the IHO.

The adoption of ISO standards to the greatest degree possible is an inherent strategy of current standards development and maintenance.

The benefits of IHO/DGIWG cooperation to Member States currently maintaining two sets of digital hydrographic data and products is significant. Other Member States benefit from the synergy of these two organizations working together to further standards development and maintenance.

The implementation of new standards that may arise from the harmonization of IHO and DGIWG standards will incur costs to Member States and the maritime industry. Most of the costs are currently addressed in the development of S-57 edition 4.

**Conclusions**

The benefits to adopting a Cooperation Agreement between the IHO and DGIWG are well articulated in the attached document. With the endorsement of CHRIS, IHO Member States should approve this adoption.

**Recommendations**

Any resultant recommendations.

**Justification and Impacts**

The IHO and DGIWG have identified the following as the main drivers for co-operation:

a. Stability. The S-57 standard and the ENC product specification and other complementary IHO standards such as S-52 and S-58 in IHO, and the DGIWG standards and product specifications built on those DGIWG standards, have all now attained some stability. Previously the DGIWG geospatial standard was called DIGEST, but the suite of standards is now broader and that name has now been replaced by the term DGIWG suite of standards.

b. Influence. Both organizations are aligning their work with that of the ISO Technical Committee on Geographic Information/Geomatics, ISO TC211. If IHO and DGIWG had a declared aim of full standards compatibility, their collective influence should be much greater in ISO than if they were lone, competing voices. This would enhance the possibility of achieving a satisfactory outcome, when seeking to influence the development of ISO standards, for both IHO and DGIWG.

c. Economic. DGI is time-consuming and expensive to capture and maintain. The overlap in information content requirements of the IHO and DGIWG would result in potential savings being made if the members of both organisations could re-use each others' information.

d. Safety. Safety would be improved for applications that use products based on DGIWG and IHO standards if the members of both organisations could re-use each others' information.

e. Stakeholders. Producers and users of information would benefit from full compatibility because it would make more information available. Vendors of systems would benefit as the standards they would be supporting would no longer be very different. In turn, these financial benefits should be passed on to producers and users.

Two areas of focus are identified:

Interoperability

a. That a joint programme of work should be developed to publish a Hydrographic Information Interoperability Report (including proposed changes to both the DGIWG and IHO suite of standards and registered items).

b. That a joint working group (the Hydrographic Interoperability Harmonization Working Group) should be established to undertake this programme of work and report back to the IHO and the DGIWG.

c. That any recommendations from this work which may influence future harmonization between S-57 and DIGEST should be endorsed by the IHO and DGIWG respectively and implemented in the next versions of their suite of standards.

Standards Harmonization

a. That a close liaison be maintained between the IHO TSMAD Edition 4.0 sub-WG and DGIWG Technical Panels, offering liaison representatives the opportunity to attend each others' meetings as appropriate.

b. That the core elements of the IHO and DGIWG suite of standards are matched as closely as possible with profiles of the ISO 19100 series and each other.

c. That where practical, the IHO and DGIWG develop shared test environments.

The proposed priority for this proposal is HIGH.

**Action Required of CHRIS**

**The CHRIS is invited to:**

a. review the attached Cooperation Agreement ,

b. provide comments and recommended changes to the IHB for forwarding to DGIWG.

c. endorse the Cooperation Agreement, recommending approval by IHO Member States.

# Cooperation Agreement

between the

## International Hydrographic Organization

## (IHO)

and the

## Digital Geographic Information Working Group

## (DGIWG)

# Document Control

**ISSUE**

| Date | Version | Summary of Changes |
|---|---|---|
| 1992 * | 1 | Cooperative Agreement between DGIWG and IHO |
| 26/07/04** | draft 1 of version 2 | First draft prepared by the UKHO |
| 11/10/04 ** | draft 2 of version 2 | AHHWG becomes GMWG<br>HDHWG becomes HIHWG<br>Occurrences of "data" changed to "information" |
| 06/04/05** | draft 3 of version 2 | Introduction of DGI term to include digital hydro info<br>Enhancement of Background section<br>Clarification regarding DGIWG standards<br>Amendment of HIHWG title and output |
| future | 2 | Revised Cooperative Agreement |

*Comments:* ** This date is an estimate. Does IHO know the actual date?*

*** This entry will be deleted when version 2 is signed.*

**APPROVALS**

| Approver and Title | Signature | Date |
|---|---|---|
| For the IHO: | | |
| For DGIWG: | | |

## 1. Purpose

The purpose of this document is to establish an understanding between the IHO and DGIWG. This document formalizes the intention of the IHO and DGIWG to co-operate to harmonize the development of their respective standards for Digital Geospatial Information (DGI)[1].

## 2. Background

DGIWG and IHO have a long history of cooperation, and have previously established a cooperative agreement that led to inclusion of common spatial schema and other common components in previous editions of the IHO and DGIWG standards. This cooperative agreement increases the level of cooperation and replaces any previous agreements.

The IHO and DGIWG have been involved in the parallel development of standards for the exchange of DGI and specifications for digital geospatial (including hydrographic) products.

The IHO has produced S-57, a transfer standard for digital hydrographic information, for use for navigational and non-navigational purposes, and a product specification for ENC (Electronic Navigational Chart) for use in ECDIS (Electronic Chart Display and Information Systems).

DGIWG has produced DIGEST, a collection of fundamental standards for digital geospatial information, which are used as the baseline for product specifications for defence purposes such as DNC (Digital Nautical Chart) and the various levels of VMAP (Vector Map).

Both organisations are working on development of their existing standards. IHO is developing the S-57 Edition 4.0 and DGIWG is developing a suite of geospatial information standards in accordance with the DGIWG Technical Vision and Development Strategy (TVDS). Both are aligning their work with that of the ISO Technical Committee on Geographic Information/Geomatics, TC211. Both are also cooperating with NATO Geospatial Maritime Working Group in support of the standardization of a suite of Additional Military Layers (AMLs) which are intended to work together with data products produced in compliance with either or both the IHO and DGIWG geospatial standards.

## 3. Drivers for Co-operation

The IHO and DGIWG have identified the following as the main drivers for co-operation:

a. Stability. The S-57 standard and the ENC product specification and other complementary IHO standards such as S-52 and S-58 in IHO, and the DGIWG standards and product specifications built on those DGIWG standards, have all now attained some stability. Previously the DGIWG geospatial standard was called DIGEST, but the suite of standards is now broader and that name has now been replaced by the term DGIWG suite of standards.

b. Influence. Both organizations are aligning their work with that of the ISO Technical Committee on Geographic Information/Geomatics, ISO TC211. If IHO and DGIWG had a declared aim of full standards compatibility, their collective influence should be much greater in ISO than if they were lone, competing voices. This would enhance the possibility of achieving a satisfactory outcome, when seeking to influence the development of ISO standards, for both IHO and DGIWG.

c. Economic. DGI is time-consuming and expensive to capture and maintain. The overlap in information content requirements of the IHO and DGIWG would result in potential savings being made if the members of both organisations could re-use each others' information.

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1 DGI is understood to include digital hydrographic information

d. Safety. Safety would be improved for applications that use products based on DGIWG and IHO standards if the members of both organisations could re-use each others' information.

e. Stakeholders. Producers and users of information would benefit from full compatibility because it would make more information available. Vendors of systems would benefit as the standards they would be supporting would no longer be very different. In turn, these financial benefits should be passed on to producers and users.

## 4. Goals

IHO-DGIWG co-operation is required to achieve:

a. The highest level of interoperability between existing products, e.g. ENC – DNC and AML – TOD. A Hydrographic Information Interoperability Standard should be developed which defines the procedures for collecting geospatial information which can be subsequently used on a multi-product basis. **Success will be indicated when information can be supplied to users in either format, irrespective of its original source format.**

Note: ENC is the IHO defined Electronic Nautical Chart product specification based on IHO S-57 edition 3.

DNC is an electronic chart product specification called Digital Nautical Chart based on DGIWG DIGEST Vector Product Format.

AML is a set of product specifications for Additional Military Layers defined by the NATO Geospatial Maritime Working Group intended to work with both IHO and DGIWG standards.

TOD is a product specification called Tactical Ocean Data based on DGIWG DIGEST Vector Product Format designed to work with DNC.

b. Harmonization of future editions of the IHO and DGIWG suites of standards. This can be best achieved by using the ISO 19100 series of GIS standards as the basis for future developments in IHO and DGIWG. This will ensure compatibility across a wide range of information content, information storage and information exchange methods. **Success will be indicated when this can be demonstrated as a routine.**

c. Maintenance of cross-referenced registers of information elements. Both DGIWG and IHO are establishing registries of information elements such as feature objects and attributes and geodetic codes and parameters in accordance with the ISO standards. Cross-referencing between elements in these registers will facilitate the conversion and common production of compatible data.

## 5. General Principles

Interoperability

a. That a joint programme of work should be developed to publish a Hydrographic Information Interoperability Report (including proposed changes to both the DGIWG and IHO suite of standards and registered items).

b. That a joint working group (the Hydrographic Interoperability Harmonization Working Group[2]) should be established to undertake this programme of work and report back to the IHO and the DGIWG.

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2 Terms of reference for this Working Group are at Appendix A to this document

c. That any recommendations from this work which may influence future harmonization between S-57 and DIGEST should be endorsed by the IHO and DGIWG respectively and implemented in the next versions of their suite of standards.

Standards Harmonization

d. That a close liaison be maintained between the IHO TSMAD Edition 4.0 sub-WG and DGIWG Technical Panels, offering liaison representatives the opportunity to attend each others' meetings as appropriate.

e. That the core elements of the IHO and DGIWG suite of standards are matched as closely as possible with profiles of the ISO 19100 series and each other.

f. That where practical, the IHO and DGIWG develop shar ed test environments.

## 6. Deliverables

a. Hydrographic Information Interoperability Report.

b. DGIWG suite of Geospatial Standards

c. IHO suite of Hydrographic Information Standards (including S-57 Edition 4.0)

## 7. Distribution of Final Standards

Both DGIWG and IHO individually retain the rights to publish all documents developed under this agreement according to their own practices. A corresponding DGIWG version of any standard developed under this cooperative agreement will be published as a DGIWG specification and will be published and circulated according to their normal practices. This may include the publication as a STANAG where appropriate.

## 8. Amendments to the Agreement

IHO (CHRIS) and DGIWG (Plenary) agree that changes to this agreement will be proposed by a resolution from one party and agreed by resolution from the other.

**Hydrographic Interoperability Harmonisation Working Group**

**Terms of Reference**

## 1 Authority

This group is formally recognized by the IHO and DGIWG and will report to both organizations (through IHO TSMAD and DGIWG PTSG) under the terms of the Co-operation Agreement to which this ToR is an Appendix. Liaison reports from this group will also be made to the NATO Geospatial Maritime Working Group or its successor. All participants will be sponsored by their parent organizations. This group will have no direct financial responsibility.

## 2 Membership

The group will be chaired by Canada and considered quorate if UK, US & Canada are represented. The group will comprise technical experts representing the IHO, DGIWG, NATO and PfP nations including any contractors in their employ.

## 3 Scope

The scope of the work is constrained to resolving the issues raised in the reference document[3].

*a. Inclusions*

All vector Hydrographic & Maritime environmental information required to support all navigation and defence requirements. Specifically but not limited to the information currently held in ENC, DNC, TOD & AML.

*b. Exclusions*

Non-vector and non-hydrographic information. Specifically, Raster, Gridded, Textual, Imagery & climatology information formats and Aeronautical & Topographic content. This group will not design, build nor populate the final database, neither will it design or build the information import or export tools.

## 4 Purpose

The group is tasked with investigating and as far as is technically possible removing the barriers to interoperability across all legacy vector Hydrographic Information, which were identified in the reference document[2].

## 5 Objectives

a. Evaluate existing technical documentation on the subject of Hydrographic Information Interoperability to thoroughly understand the issues.

b. Identify the actions necessary to achieve improved levels of Hydrographic information interoperability.

c. Prioritise the necessary action to efficiently bring about improved interoperability.

d. Plan and carry out the work.

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[3] *Interoperability Through Hydrographic Standards Harmonization:* IDON, 2003

## 6 Approach

Due to the complex nature of the issues to be addressed and the depth of specialist knowledge required it will not be possible for significant work to be done by individuals in isolation. The group will conduct its business in plenary sessions and sub-working groups, as necessary, at the discretion of the chairman.

## 7 Timeframe

The group will aim to meet at 4-month intervals over a period of 2 years unless either its work is complete before this time or its remit is extended by DGIWG & IHO.

## 8 Deliverables

A **Hydrographic Interoperability Report**, comprising:

a. Technical documentation to support the design of a database with the capability to import, store and maintain information from any of the specific sources quoted in 3a in a source-product independent form.

b. Technical documentation to support the capability to export products, conformant to each of the legacy Product Specifications and updates to those products, from the product independent database.

## 9 Success Criteria

All technical barriers to interoperability can be removed. There remains no theoretical, technical constraint on the usability of legacy information derived from any of the source products quoted in 3a.