**5TH MEETING OF THE HYDROGRAPHIC SERVICES AND STANDARDS COMMITTEE**
**Shanghai, China, 5-8 November 2013**

**Paper for Consideration by HSSC**

# Review of the Structure of HSSC Working Groups

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| ***Submitted by:*** | IHB |
| ***Executive Summary:*** | This paper reviews the current structure and operation of HSSC Working Groups in the light of the take up of S-100 in particular. It recommends considering a new structure to accompany the transition to S-100 based interoperable product and services. |
| ***Related Documents:*** | Final minutes of CHRIS 19 (section 10)<br>Final minutes of CHRIS 20 (section 9)<br>Final minutes of HSSC 1 (section 10)<br>HSSC3-04A: The Restructure of HSSC WGs<br>Final minutes of HSSC 3 (section 4)<br>Final minutes of HSSC 4 (section 5.1.6)<br>HSSC5-01D: Terms of Reference for HSSC and related Working Groups |
| ***Related Projects:*** | Development of S-100 and related tasks. |

## Introduction / Background

1. The current structure of the HSSC Working Groups (WG) was agreed at the 19th meeting of the CHRIS Committee (2007) in accordance with Decision No. 18 of the 17th International Hydrographic Conference (IHC). HSSC took over the existing CHRIS working groups:

- Transfer Standard Maintenance and Applications Development WG (TSMAD),
- Data Protection Scheme WG (DPSWG)
- Colours and Symbols Maintenance WG (CSMWG),
- Standardization of Nautical Publications WG (SNPWG),
- Chart Standardization and Paper Chart WG (CSPCWG),
- Data Quality WG (DQWG),
- Marine Spatial Data Infrastructure (MSDIWG).

In addition, HSSC was tasked to oversee the work of the following bodies:

- IHO Tidal Committee,
- IHO/IAG Advisory Board on the Law of the Sea (ABLOS),
- Hydrographic Dictionary WG (HDWG),
- S-44 WG (dormant).

2. CHRIS 19 agreed that there was no need to establish two Sub-Committees as proposed by the Strategic Planning Working Group in order to facilitate the coordination of data and presentation standards respectively.

3. ABLOS is an inter-organizational body with specific terms of reference approved jointly by the IHO and the International Association of Geodesy. Its activities are specific and its interaction with the HSSC WGs does not require further consideration in this paper.

4. CHRIS 20 (2008) endorsed the renaming of CSMWG to Digital Information Portrayal WG (DIPWG) and agreed that the IHO Tidal Committee would be renamed "Tidal and Water Level Working Group" (TWLWG). It also established the ENC Updating WG (EUWG) which was disbanded in 2011.

5. The Terms of Reference (ToR) and Rules of Procedure (RoP) of HSSC had been approved by Member States in late 2007 (CL 115/2007). As decided by the 17th IHC, HSSC was formally established on 1 January 2009. An editorial amendment to its ToR and RoP was approved by the 18th IHC in 2012. Article 2.8 of HSSC RoP stipulates that "The Committee shall progress its work primarily through Working Groups, each of which shall address specific tasks." The establishment of WG is governed by IHO Resolution 11/1962 as amended which specifies that it is up to each Committee to determine and approve the ToR and RoP of its WG. Article 1.11 of HSSC ToR instructs the Committee to "review annually the continuing need for each Working Group previously established by the Committee." The ToR and RoP of the HSSC Working Groups were confirmed or approved at the 1st meeting of HSSC (2009) with the addition of the "nine-week moratorium" clause (i.e. WG meetings should not normally occur later than nine weeks before a meeting of the HSSC).

6. The increasing workload associated with the development of S-100 and associated Product Specifications prompted the Chairs of TSMAD, DPSWG and DQWG to submit to HSSC3 (2011) a proposal to restructure certain WG and introduce the concept of an annual combined meeting. This proposal was not agreed by the Committee and no further action was decided.

7. HSSC4 (2012) decided to establish an additional WG, the Surface Current Working Group (SCWG), to develop standards for the delivery and presentation of navigationally relevant current information.

8. Three elements justify revisiting the structure of the HSSC Working Groups:

- The endorsement by IMO (MSC 90, 2012) of the use of S-100 as the baseline for creating a framework for data access and services under the scope of SOLAS (the so-called "Common Maritime Data Structure") which will result in increasing demands on the IHO [in the context of the forthcoming adoption of the e-navigation strategy implementation plan];
- The development of integrated chart production systems where ENCs and paper charts are derived from a common GIS-based infrastructure;
- The expected completion in 2014 of the revision cycle of S-4 which has been a main task of the CSPCWG.

**Analysis/Discussion**

***Review of the tasks of the HSSC WG***

9. Table 1 summarizes the main tasks of the current HSSC WG in relation with the terms of reference of HSSC.

*Table 1*
*Main tasks of the current HSSC WG*

| Terms of Reference of HSSC | Working Group | Task[1] | Comment |
|---|---|---|---|
| 1.1 Monitor the requirements of mariners and other users of hydrographic information concerning the use of hydrographic products and information systems that may require data and information provided by national hydrographic authorities, and to identify those technical matters that may affect the activities and products of those authorities. | TSMAD | Identify and promote the availability of other navigation-related data in ECDIS and in IHO geospatial standard-compliant format. | |
| | DIPWG | Monitor the operational performance and development of IHO specifications, progress in display technology, and human perception analysis.<br>Consider new topics and other applications affecting electronic chart display, and/or draft the relevant extension documents. | |
| | DQWG | Investigate ways of ensuring that ECDIS displays provide a clear warning or indication to the mariner on the quality of the underlying survey data, through appropriate use of the attribute CATZOC and/or improvement of the existing display capabilities | |
| | MSDIWG | Monitor national and international SDI activities. | |
| | TWLWG | Propose new tidal, water level and vertical datum topics and other applications for consideration by HSSC. | |
| | SCWG | Advise on matters concerning the exchange, distribution and use of navigationally relevant current data | |
| 1.2 Monitor the work of specified IHO Inter-Organizational Bodies engaged in hydrographic services, standards and related technical activities as directed by the International Hydrographic Conference ("International Hydrographic Conference" to be replaced by "Assembly" when the Assembly is established) and provide advice and guidance to the IHO representatives as required. | NA | | Relates to the supervision of ABLOS by HSSC. |

[1] Based on the current ToR and Work Plan of each WG, except for the tasks in brackets […] which are not specifically mentioned.

| Terms of Reference of HSSC | Working Group | Task[1] | Comment |
|---|---|---|---|
| 1.3 Study and propose methods and standards for the acquisition, assessment and provision of official hydrographic data, nautical products and other related services. | TSMAD | Maintain, develop and extend:<br>(i) the S-57 IHO transfer standard for digital hydrographic data;<br>(ii) the S-100 IHO Geospatial Standard for Hydrographic Data;<br>(iii) the S-101 IHO ENC Product Specification;<br>Monitor the development of other related international standards. | |
| | DPSWG | Develop and maintain an IHO ENC data protection scheme. | |
| | DIPWG | Maintain IHO specifications for colours, symbols and display rules used to show SENC information on ECDIS in a safe and ergonomic manner. | |
| | SNPWG | Develop guidelines for the preparation of nautical publications, in a digital format compatible with ECDIS. | |
| | CSPCWG | Provide a core of expertise on the concepts of charting, noting that whatever physical form the chart may take the fundamental concepts and elements of marine cartography remain the same.<br>Advise the IHB and Regional Hydrographic Commissions, as appropriate, on the work of International Charting Coordination Working Groups (ICCWG) or Regional Charting Groups (RCG) in order to promote the production of international (INT) charts.<br>Offer advice based on its experience to ICCWG/RCG and individual Member States, on chart schemes and cartographic work, in order to strongly encourage adherence to IHO charting specifications.<br>Develop of new (and revised) symbology. | |
| | DQWG | Develop appropriate methods of classifying and depicting the quality of digital hydrographic data. | |

| Terms of Reference of HSSC | Working Group | Task[1] | Comment |
|---|---|---|---|
| | MSDIWG | Support the SDI activities of the IHO.<br>Determine any actions that the IHO and individual M/S might take to forge links with other bodies (e.g. OGC, ISO TC211, IOC) to ensure M/S are best placed to meet the developing challenges associated with data management and governance.<br>Identify and recommend possible solutions to any significant technical issues related to interoperability between maritime and land based inputs to SDI. | |
| | TWLWG | Provide technical advice and coordination on tidal, water level and vertical datum matters.<br>Study principles and methods for conveying tidal and water level information to mariners. | |
| | HDWG | Review and update the definitions in the IHO Hydrographic Dictionary in English, French and Spanish. | |
| | SCWG | Develop standards for the delivery and presentation of navigationally relevant current information. | |
| 1.4 Maintain technical liaison with other relevant stakeholders, such as type-approval authorities, navigation equipment manufacturers, and the hydrographic data user-community. | TSMAD | Liaise with other HSSC WG's, international organizations and industry to educate and encourage the application of IHO standards to the work of those organizations.<br>Provide outreach and technical assistance regarding transfer standards. | |
| | DPSWG | Liaise and harmonise with other international ECDIS-related bodies as appropriate.<br>Provide technical and operational support to Data Servers and OEMs. | |

| Terms of Reference of HSSC | Working Group | Task[1] | Comment |
|---|---|---|---|
| | DIPWG | Identify basic scientific fundamentals and provide guidance to ECDIS manufacturers related to colours and symbolization of hydrographic information.<br>Provide and maintain a framework for display of SENC information that is feasible and practicable within available technology.<br>Coordinate technical exchange between DIPWG, type-approval authorities, ECDIS manufacturers and ECDIS user community, including the conduction of comprehensive testing and validation of colours and symbolization by manufacturers, and at-sea trials with mariners.<br>Contribute to IEC TC80/WG13 symbol harmonizing work | |
| | SNPWG | Liaise with other HSSC WG's and other IHO and international bodies as appropriate and as instructed by HSSC. | |
| | CSPCWG | Maintain close liaison with other HSSC WGs, particularly DIPWG and TSMAD, and other international and IHO bodies, as appropriate and as instructed by HSSC. | |
| | DQWG | Liaise with other relevant HSSC WG's and other IHO bodies, such as S-44 WG, and international bodies as appropriate and as instructed by HSSC. | |
| | MSDIWG | Promote the use of IHO standards and member state marine data in SDI activities.<br>Liaise, as appropriate, with other relevant technical bodies such as the IOC, and the World Data Centres for Oceanography, Bathymetry and Marine Geophysics, to increase the visibility of marine spatial data. | |
| | TWLWG | Liaise with other WG's; other IHO and international bodies as appropriate; and as instructed by HSSC. | |
| | HDWG | Liaise as appropriate with other organisations developing dictionaries and/or glossaries. | |
| | SCWG | Liaise with other international bodies as appropriate. | |

| Terms of Reference of HSSC | Working Group | Task[1] | Comment |
|---|---|---|---|
| 1.5 Prepare and maintain publications related to the objectives of the Committee. | TSMAD | S-57<br>S-58<br>S-61<br>S-64<br>S-65<br>S-99<br>S-100<br>S-100 GI Registry<br>S-101<br>S-102 | |
| | DPSWG | S-63<br>S-100 (data protection and authentication related elements)<br>S-101 (data protection and authentication related elements) | Discussions are taking place between TSMAD and DPSWG to incorporate some elements of S-63 into S-100. |
| | DIPWG | S-52<br>S-52 Presentation Library<br>S-100 (portrayal elements)<br>S-100 GI Registry (portrayal register) | |
| | SNPWG | M-3 (Resolutions related to Nautical Publications)<br>[S-12]<br>S-10n Nautical Information Product Specification | |
| | CSPCWG | S-4<br>S-11 Part A<br>S-49<br>INT 1/2/3 | |
| | DQWG | [S-4 (quality indicators)]<br>S-57 (quality indicators)<br>S-100 (quality indicators)<br>S-52 (presentation of data quality)<br>S-52 Presentation Library (presentation of data quality)<br>[S-10n (quality indicators)] | |
| | MSDIWG | C-17<br>M-3 (Resolutions related to SDI)<br>S-100 (interoperability with SDI; oceanographic, marine biological, geological and geophysical data structures) | |
| | TWLWG | M-3 (Resolutions relating to tidal, water level and vertical datums)<br>Standard Tidal Constituent List<br>Inventory of Tide Gauges<br>On-line real time water level observation document<br>Product Specification for Digital Tide Tables<br>Product Specification for Dynamic Application of Tides in ECDIS<br>Product Specification for the transmission of real-time tidal data | |
| | HDWG | S-32 | |
| | SCWG | Product specifications for navigationally relevant currents | |

| Terms of Reference of HSSC | Working Group | Task[1] | Comment |
|---|---|---|---|
| 1.6 Prepare a Committee Work Program and propose it to each ordinary session of the International Hydrographic Conference ("each ordinary session of the International Hydrographic Conference" to be replaced by "each ordinary session of the Assembly through the Council" when the Assembly and the Council are established). Consider and decide upon proposals for new work items under the Committee Work Program, taking into account the financial, administrative and wider stakeholder consequences and the IHO Strategic Plan and Work Program. | All | Identify a work programme for each year, including expected time frame. | Clause missing in the ToR of DQWG, MSDIWG, TWLWG and SCWG. |
| 1.7 Monitor the execution of the Committee Work Program and report to each ordinary session of the International Hydrographic Conference ("ordinary session of the International Hydrographic Conference" to be replaced by "meeting of the Council" when the Council and Assembly are established), including an evaluation of the performance achieved. | NA | | |
| 1.8 Propose to the International Hydrographic Conference ("the International Hydrographic Conference" to be replaced by "the Assembly through the Council" when the Council and Assembly are established), the establishment of new Sub-Committees, when needed, supported by a comprehensive cost-benefit analysis. | NA | | |
| 1.9 As required, establish Working Groups to fulfil the Committee Work Program, in conformance with IHO Resolution 11/1962 as amended ("IHO Resolution 11/1962 as amended" to be replaced by "Article 6 of the General Regulations" when the revised IHO Convention enters into force) and approve their Terms of Reference and Rules of Procedure. | NA | | |

| Terms of Reference of HSSC | Working Group | Task[1] | Comment |
|---|---|---|---|
| 1.10 Monitor the work of its Sub-committees, Working Groups and other bodies directly subordinate to the Committee. | NA | | |
| 1.11 Review annually the continuing need for each Working Group previously established by the Committee. | NA | | |
| 1.12 Liaise and maintain contact with relevant IHO and other bodies to ensure that IHO work activities are coordinated. | NA | | |
| 1.13 Liaise with other relevant international organizations and Non-Government International Organizations (NGIOs). | NA | | |

10. This breakdown indicates clearly that the main area of interaction between the HSSC WG concerns the maintenance of the publications under the responsibility of HSSC. Table 2, derived from Table 1, indicates the WG involved in the maintenance of the different publications.

*Table 2*
*WG involved in the maintenance of the publications under the responsibility of HSSC*

| WG / Pub. | TSMAD | DPSWG | DIPWG | SNPWG | CSPCWG | DQWG | MSDIWG | TWLWG | HDWG | SCWG |
|---|---|---|---|---|---|---|---|---|---|---|
| C-17 | | | | | | | X | | | |
| INT 1/2/3 | | | | | X | | | | | |
| M-3 | | | | X | | | X | X | | |
| S-4 | | | | | X | [X] | | | | |
| S-11 Part A | | | | | X | | | | | |
| S-12 | | | | [X] | | | | | | |
| S-32 | | | | | | | | | X | |
| S-44 | | | | | | X | | | | |
| S-49 | | | | | X | | | | | |
| S-52 | | | X | | | X | | | | |
| S-52 PL | | | X | | | X | | | | |
| S-57 | X | | | | | X | | | | |
| S-58 | X | | | | | | | | | |

| WG / Pub. | TSMAD | DPSWG | DIPWG | SNPWG | CSPCWG | DQWG | MSDIWG | TWLWG | HDWG | SCWG |
|---|---|---|---|---|---|---|---|---|---|---|
| S-61 | X | | | | | | | | | |
| S-63 | | X | | | | | | | | |
| S-64 | X | | | | | | | | | |
| S-65 | X | | | | | | | | | |
| S-99 | X | | | | | | | | | |
| S-100 | X | X | X | | | X | X | | | |
| S-100 GI Registry | X | | X | | | | | | | |
| S-101 | X | X | X | | | [X] | | | | |
| S-102 | X | | | | | [X] | | | | |
| S-10n (NP) | | | | X | | [X] | | | | |
| S-10n (Tides) | | | | | | [X] | | X | | |
| S-10n (Currents) | | | | | | [X] | | | | X |

11. Apart from quality issues and the update of the relevant IHO Resolutions in M-3 which involve more than one WG, the development of S-100 and S-101 is a core task of three groups: TSMAD, DPSWG and DIPWG. ***Therefore, the take up of S-100 justifies reviewing the adequacy of the current organization of TSMAD, DPSWG and DIPWG.***

***Review of the membership of the HSSC WG***

12. Apart from IHB representatives, the current membership of the HSSC WG involves 188 participants from 44 Member States (MS) and 60 expert contributors from 36 different organizations (industry and academia). 25 MS representatives (13%) and 10 expert contributors (17%) participate in more than one WG. Table 3 shows for each WG the number of members who participate in another WG.

*Table 3*
*Cross-participation in HSSC WG*

| | TSMAD | DPSWG | DIPWG | SNPWG | CSPCWG | DQWG | MSDIWG | TWLWG | HDWG | SCWG |
|---|---|---|---|---|---|---|---|---|---|---|
| TSMAD | 38 (28+10) | 0 | 8 (5+3) | 1 (0+1) | 6 (5+1) | 2 (1+1) | 2 (2+0) | 0 | 1 (1+0) | 0 |
| DPSWG | | 18 (12+6) | 5 (2+3) | 0 | 0 | 0 | 0 | 0 | 0 | 1 (1+0) |
| DIPWG | | | 46 (21+25) | 2 (0+2) | 5 (5+0) | 2 (0+2) | 0 | 1 (0+1) | 1 (1+0) | 0 |
| SNPWG | | | | 30 (24+6) | 0 | 1 (0+1) | 1 (1+0) | 1 (1+0) | 0 | 0 |
| CSPCWG | | | | | 38 (36+2) | 2 (2+0) | 2 (2+0) | 0 | 1 (1+0) | 0 |
| DQWG | | | | | | 31 (23+8) | 1 (1+0) | 0 | 1 (1+0) | 0 |
| MSDIWG | | | | | | | 33 (28+5) | 0 | 0 | 0 |

| | TSMAD | DPSWG | DIPWG | SNPWG | CSPCWG | DQWG | MSDIWG | TWLWG | HDWG | SCWG |
|---|---|---|---|---|---|---|---|---|---|---|
| TWLWG | | | | | | | | 34 (32+2) | 0 | 2 (2+0) |
| HDWG | | | | | | | | | 10 (10+0) | 0 |
| SCWG | | | | | | | | | | 11 (11+0) |

13. Table 3 shows that there is significant cross-participation between four WG (TSMAD, DPSWG, DIPWG and CSPCWG) with more than 5 members participating in more than one WG. ***Therefore the current status of the membership justifies reviewing whether the current organization of TSMAD, DPSWG, DIPWG and CSPCWG is still adequate, in relation with the resources made available by MS, academia and industry.***

14. Incidentally, three issues of concern are worth noting from this review of the WG membership:

- The overall limited participation of MS: the highest participation of MS does not exceed one third of the current IHO membership (29 MS represented in CSPCWG) and eight MS contribute for more than half of the total IHO membership (98 participants out of 188).
- The absence or quasi-absence of industry participation in three WG involved in the development or maintenance of product standards: CSPCWG, TWLWG and SCWG.
- Additionally, the development of S-100 and S-100 based product specifications broadens the range of expertise required and makes it more difficult to ensure the cohesion and the attractiveness of the WG.

***The review of the current organization of the HSSC WG should also aim at making active participation more attractive to MS, academia and industry.***

***Review of the operation of the HSSC WG***

15. All HSSC WG are encouraged to work mainly by correspondence and minimize the number of meetings.

16. TSMAD meets twice a year. One meeting is a joint TSMAD-DIPWG meeting. The agenda of TSMAD meetings provides for report from the other HSSC WG concerned by transfer standards, namely DPSWG, SNPWG, CSPCWG, DQWG, MSDIWG, TWLWG and SCWG.

17. DPSWG meets less regularly (three meetings during the period 2009-2013).

18. Since 2009, DIPWG has always met in conjunction with TSMAD.

19. SNPWG generally meets once a year. Its work is informed by the outcome of TSMAD and DIPWG activities.

20. CSPCWG meets annually. Its work is informed by the outcome of TSMAD, DIPWG, DQWG and HDWG activities.

21. DQWG meets annually in general (six meetings during the period 2009-2013). It addresses quality issues referred to it by the other WG.

22. MSDIWG has met only twice in the period 2009-2013. There has not been any direct interaction with the other WG.

23. TWLWG meets annually. The meeting agendas do not reflect any regular interaction with the other WG.

24. HDWG has not met during the period 2009-2013. It addresses issues referred to it by the other WG.

25. SCWG plans to meet annually. It engages with TSMAD, DIPWG and TWLWG.

26. ***The fact that DIPWG has always met jointly with TSMAD needs to be considered when reviewing the adequacy of the current organization.***

***Impact of the development of S-100***

27. The recognition of S-100 as the baseline for the so-called "Common Maritime Data Structure" should encourage the use of S-100 and the development of interoperable S-100 based products which in turn could drive the transition to S-101 ENC. Apart from completing the development of S-100 itself, the three main aspects to be taken into account in the longer term are:

- the need to consolidate the governance and operation of the S-100 GI Registry,
- the need to develop and maintain a growing number of IHO S-100 based product specifications, and
- the need to provide technical guidance and support to non-IHO developers of S-100 based product specifications.

28. The governance and operation of the S-100 GI Registry is one of the many activities of TSMAD with a contribution of DIPWG for portrayal issues. The consolidation of this function probably requires identifying more visibly within HSSC a "one-stop" organ responsible for supervising the maintenance and operation of the Registry in liaison with the Registry owner and Registry manager, as defined in S-99. This organ could also operate as the IHO component of the Registry control bodies (Executive Control Body and Domain Control Bodies) as well as the IHO component of the dormant IMO/IHO Harmonization Group on Data Modelling established by MSC 90. ***Accordingly, it is proposed, as a priority, to establish an S-100 Working Group reporting directly to HSSC***. The composition of this proposed new WG, the method for determining its Chair and Vice-Chair and funding (travel expenses in particular) should ensure the long-term availability, reliability and sustainability of the WG functions.

29. The development of IHO S-100 based product specifications has not been clearly structured so far. Some product specifications are being developed under the direction of TSMAD with the contributions of other WGs. Others are developed by the "specialist" WG (SNPWG, TWLWG, SCWG) with TSMAD and DIPWG providing expert support. It seems unlikely for the time being that a product specification could be developed successfully without a combination of expertise in the relevant specialist domain and expertise in the implementation of the S-100 framework. It is probable that the latter will be limited to few persons for some time. ***The following principles are suggested to improve the current situation:***

- ***a pool of S-100 experts able to guide the development of new product specifications should be established and maintained, within the S-100 WG or under its supervision;***
- ***the development of each product specification should be run as a time-limited project preferably by a specific working group established and disbanded by HSSC;***
- ***the definition of sustainable maintenance arrangements once the product specification has been developed should be an integral part of the deliverables of the product specification project;***
- ***the transition from the current organization of WG involved in the development of standards and product specification to the new structure should be considered by HSSC on a case by case basis, in consultation with the WG involved.***

30. The requests for guidance and support from non IHO developers of S-100 based product specifications could then be examined by the S-100 WG which would then propose to HSSC the way forward.

31. The development of new product specifications through time-limited projects should facilitate the participation of MS, industry and other stakeholders.

***Future of S-4 and related publications***

32. The publication S-4 - *Regulations of the IHO for International (INT) Charts and Chart Specifications of the IHO*, (formerly M-4) includes:

- Part A: 'Regulations of the IHO for International (INT) Charts'

- Part B: 'Chart Specifications of the IHO for Medium- and Large-scale National and International (INT) Charts'
- Part C: 'Chart Specifications of the IHO for Small-Scale International (INT) Charts'

S-4 Part B addresses two objectives:

- an explanation of the general concepts and rationale behind the portrayal of features on charts, much of which is relevant to both electronic and paper charts.
- a contemporary community specification for paper charts, including the use of text and symbology.

The two objectives are more or less intertwined in the current edition. S-57 refers to S-4 specifications via its Appendix A - *IHO Object Catalogue*. S-100 will refer to S-4 via the portrayal register.

33. In parallel with the publication of the 3rd edition of S-4 (2005), a complete revision cycle of Part B had been undertaken by the CSPCWG. This cycle should be completed in 2014 with the revision of section B-500. This milestone offers an opportunity to reconsider the organization of IHO chart specifications in relation to digital and paper products. With the generalization of the use of ECDIS, the development of e-navigation, and the generalization of GIS-based chart production systems, it seems that the time has come to consider shifting the underlying framework of chart specifications from paper to digital products. Noting that this should coincide with the transition from S-57 based ENC to S-100 based ENC, it might be appropriate to reconsider also the separation between nautical charts and nautical publications and to promote an integrated approach for the provision of chart and other geo-referenced nautical information.

34. ***Accordingly it is proposed to merge CSPCWG and SNPWG and to focus their activities on the standardization of digital products.***

***Other considerations***

35. Although discussions are taking place between TSMAD and DPSWG to incorporate some elements of S-63 into S-100, it is proposed to keep DPSWG as a separate working group considering the specificity of the relevant expertise.

36. In order to consolidate the specialist expertise on tides and currents, it is proposed to include currents in the scope of TWLWG.

37. At this stage, it is proposed to maintain DQWG, MSDIWG and HDWG under their current terms of reference.

**Conclusion**

38. The take-up of S-100 requires adapting the current structure of the HSSC WG.

**Recommendations**

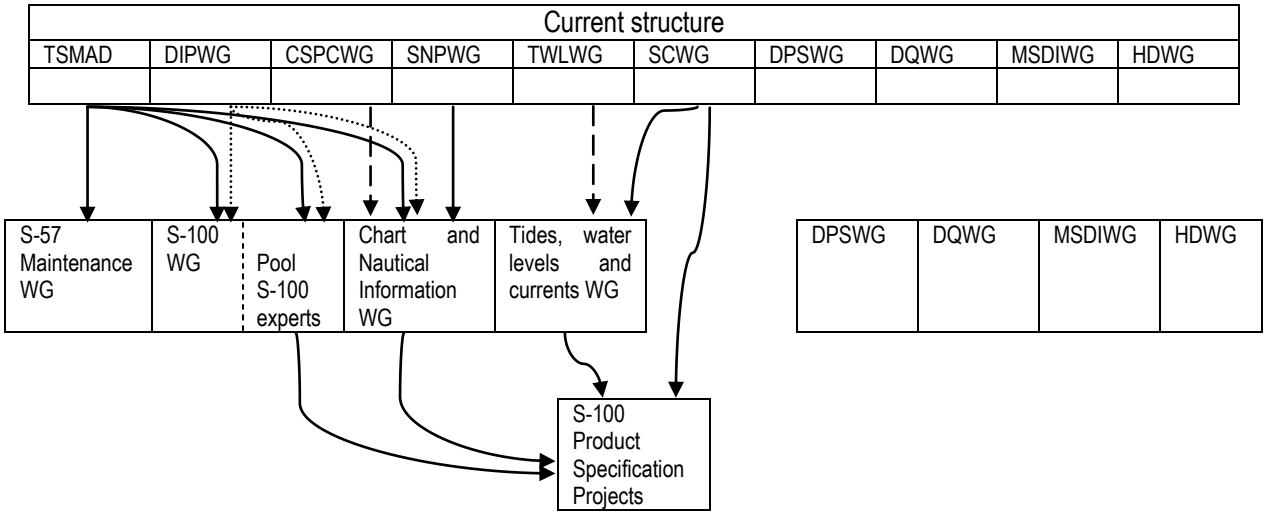
39. The above analysis leads to recommend the following adaptation (see Figure 1):

- Establish an S-100 WG including, or associated with, a pool of S-100 experts;
- Merge CSPCWG and SNPWG and focus the activities of the new working group on the standardization of digital products;
- Extend the scope of TWLWG to include issues related to currents;
- Set-up time-limited projects for the development of S-100 based product specifications.

40. It is recommended that the HSSC Chair Group be tasked to set up a transition plan, including the detailed allocation of the maintenance of current publications.

*Figure 1*
*Proposed adaptation of the structure of HSSC WG*

*Note: the different line types are associated with the different parent WG in the current structure.*




Proposed structure

**Justification and Impacts**

41. The new structure should put the IHO in general and HSSC in particular in a better position to face the take up of S-100. It also reflects the transfer from paper products to digital products as the primary navigation tools.

42. No negative impact is foreseen, subject to managing carefully the transition, including its timing, to ensure continuity and the orderly completion of current tasks.

43. The outcome of the on-going development at IMO of an e-navigation strategy implementation plan, expected in 2014, may have an impact on the timing of the transition.

**Action required of HSSC**

44. The HSSC is invited to:

a. **note** this report;

b. **consider** the principles outlined in sections 11, 13, 14, 26, 28, 29, 34 to 37;

c. **adopt** the recommendations in sections 39 and 40; and

d. **take** any other **action** as appropriate.