

2nd Surface Current Working Group Meeting

28 - 30 May 2014, Office of Department of Oceans and Fisheries, Quebec City, Canada

Report to the 6th meeting of the Hydrographic Services and Standards Committee

(Paragraph numbering is the same as the Agenda Item numbering and does not necessarily reflect the order in which matters were discussed.)

1 Opening

- 1.1 The Chair, Mr Kurt Hess (NOAA-USA), opened the meeting at 0907. He thanked the Office of the Department of Oceans and Fisheries (DOF) for the meeting arrangements, particularly the availability of internet in the meeting room. He then thanked all participants for coming, particularly welcoming new members. He gave a brief synopsis of the work completed since the SCWG 1 meeting and praised the commitment and efforts of all for the progress made; he hope the momentum would be maintained over the next year and that it would be just as productive. All participants – representing Canada, France, Netherlands, USA (NOAA and NGA) and expert contributors from Center for Coastal and Ocean Mapping, University of New Hampshire, SPAWAR Atlantic and Jeppesen – introduced themselves. Administration and security arrangements were detailed. List of participants is at Annex A.
- 1.2 On behalf of the Canadian Hydrographic Service (CHS), Mr Louis Maltais, vice-Chair of SCWG, welcomed all participants and wished them a successful meeting. He provided a brief outline of CHS activities and the divisions of responsibilities.
- 1.3 David Wyatt (IHB), on behalf of the Directing Committee thanked CHS and DOF for hosting the meeting and providing a high level of support and excellent facilities. Some of the outcomes from HSSC 5 were highlighted, including the preliminary list of S-100 based product specifications (PS), noting it was agreed 15 (now 16) different ones were identified for the IHO, 5 for IALA and 3 for IOC; S-111 had been identified for Surface Currents. He noted that this was just the start as the IMO has confirmed the IHO S-100 as the data standard supporting its e-Navigation initiative.

He noted a number of other WGs were progressing the development of other PS, the most significant for S-111 were S-101 (ENC), S-102 (Bathymetric Surface), S-103 (Sub-surface Navigation) and Dynamic Tides (S-10x yet to be identified). He also noted that TWLWG had made a good deal of progress at its meeting in Wollongong at the end of February, some of the output had been made available on the SCWG webpage and the meeting report had been passed to the SCWG Chair. It was highlighted there is a degree of overlap and similarity between their work and the work SCWG are undertaking, also there are significant differences; HSSC is keen for both WGs to work together where there is common ground to accelerate progress and avoid two solutions for similar issues, thus dialogue between the two WGs is essential to ensure nugatory work is not undertaken.

There are many solutions to creating the PS and he gave some thoughts for consideration by SCWG: where is S-111 of significance and where will it be of most use; where is the data to support the PS; is a focused approach more initially achievable rather than a global solution; how will interpolation between known points be approached; and have all different gridding and portrayal methods been considered; where is the best location for the processing of the data to produce an

ENC overlay, ashore or afloat? He stressed the importance of liaison with other IHO bodies and the appropriate engagement with industry to progress the work items, noting that the SCWG contained limited experience of S-100 issues.

The Chair endorsed these sentiments and he highlighted a need for continued active engagement by the SCWG members during and between meetings to progress action and Work Plan (WP) items.

2 **Administrative Arrangements**

- 2.1 The Chair introduced the Agenda which was adopted, Annex B. A list of documents for the meeting is at Annex C.
- 2.2 The timetable was agreed, and it was explained that this was intended for guidance only and was not intended to be a rigid structure. Where necessary time spent on individual topics would be amended to allow an appropriate discussion. In particular, the scheduling of the presentation by Caris was changed to accommodate the speaker.
- 2.3 IHB provided a brief outline of HSSC 5 outcomes and TSMAD activities, detailing some of the background to the HSSC reorganization and its current state. He also noted the response to the SCWG report to HSSC 5 and the actions required.

Particular items and topics of interest from TSMAD were highlighted, these included:

New edition of S-52 and presentation library (shortly sent out for MS approval).

New edition of S-64 (shortly to be sent out for MS approval).

Completion of the portrayal catalogue builder (done under contract by Caris) and the feature catalogue builder (being done by KHOA).

New product specifications on maritime boundaries, and ice information.

IEHG work on an S-101 equivalent PS for inland ENC.

He noted TSMAD aimed to submit a new edition of S-100 to next HSSC for endorsement. There are several upgrades to the standard – notably the expansion of metadata, inclusion of a chapter on portrayal, code lists, and GML encoding. The standard still needs to be revised to include HDF5 encoding – which is used for S-102.

In addition it was noted that WWNWS-SC has commenced developing S-100 NW PS and WMO are developing sea ice limits and met-ocean forecast PS. (Contact details for WMO personnel are:

Vasily Smolyanitsky (Arctic and Antarctic Research Institute of Russia) – vms@ari.ag

Henri Savina (Météo France) – henri.savina@meteo.fr

Val Swail (Met Service Canada) – val.swail@ec.gc.ca

John Parker (Met Service Canada) – john.parker@ec.gc.ca

Tim Rulon (Marine and Coastal Weather Service) – timothy.rulon@noaa.gov
(lead on met-ocean forecast PS)

- 2.4 The Chair presented the current WP 2014-2015, highlighting the progress made on a number of tasks. The requested engagement with various industry experts was noted

and the presence of a number of participants was testament to the interest there was in S-111. He acknowledged that some of the dates in the WP would need to be amended as a result of the discussions at the meeting. The Chair also noted, with praise, that all Actions from the previous meeting had been completed.

3 **Presentations**

- 3.1 UNH gave a presentation on their Surface Currents Design Survey and Report (SCWG 2-3.1), which remains on-going. It was noted that rules for placement needed to be more closely considered as it is important not to obscure charted data. Jeppesen highlighted the efforts being directed towards route planning, where all data needs to be available; real-time routing execution needs to show the users selected data without obscuring safety critical information. UNH explained how stream line data can be visualized by a user, the density can be altered from the gridded data.

Current file sizes being contemplated means that these files need to be created ashore, so transmission of the data to users needs to be considered. It was noted that creating multiple overlays ashore for multiple users afloat would be beyond the majority of shore organizations and authorities. Ways of servicing user needs within current and legacy technology whilst also considering potential future developments were discussed. It was highlighted that the government requirement was to provide the minimum standard acceptable whilst the industry approach was to provide the maximum solution achievable.

- 3.2 NOAA gave a presentation on their Physical Oceanographic Real-Time system (PORTS) (SCWG 2-3.3). The Chair noted the need to be aware of real-time systems, from where the data was coming and how it can be accessed. This is also a major concern of the TWLWG.

The vice-Chair explained how the CHS data provision was being developed to make information publicly available in a standard format for user development and customization.

- 3.3 IHB gave an up-date on TWLWG 6 outcomes and activities, especially the work presently being undertaken by OMC International on the display of areas of safe navigation. This generated considerable interest and discussion, particularly about the visualization method.
- 3.4 Caris gave a presentation on its Raster Surface Products, which provided some background to current products and likely future development.

4 **Programme matters**

- 4.1 The Chair gave a brief on his engagement with TSMAD and DIPWG, focusing on the development process of S-100 and the requirements for developing S-111. He focused on the categories of features for currents (SCWG 2-4.1). Considerable discussion was initiated on the acceptable grid type and formats, it was suggested to develop a simple solution on which further progress and developments could be made at a later stage when more complex solutions may be required and can be created.

The Chair then detailed his initial work on developing feature attributes.

There was further discussion on authorised suppliers of data and which organizations in the process would actually undertake the encoding, it was asked whether a third party could undertake this work on behalf of a national Hydrographic Office (HO). It

was questioned whether official HO data needed to be used and how port-supplied data was handled in this respect.

Clarity was sought on the process when data already included in an ENC was in conflict with S-111 overlay data. Further it was queried how S-111 data should be displayed or overlaid, should it be an over or under, noting the current provisions within S-100.

It was suggested the SCWG needed to consider where and when real-time data would be used or be significant; this needed to be considered against uses for route planning.

- 4.2 Netherlands gave a presentation and brief on the results of the User Survey questionnaire, (SCWG 2-4.2b). It was noted that there was a need to confirm responses matched the ToRs and then to take the development work forward using the analysis as a guide. Unless significant issues were identified, wish list items should be kept for future development. It was clear there was a need to raise awareness of current data and its availability by highlighting on HO web pages along with tidal data.

There was considerable discussion over the preference between grid points or streamlines for current data points, it was suggested it may depend on for what the product is being used, planning or real-time. It was also noted there was a need to identify the depth for which the data was given and consideration needed to be given on the forecast period.

Comments on the questionnaire analysis should be forwarded to Netherlands by 15 June and a final report on the User Survey questionnaire, including all additional comments would be published in the SCWG section of the IHO website by 30 June.

Action All/Netherlands/IHB

- 4.3 The vice-Chair gave a brief on the initial draft document to create the S-111 PS. It was agreed the selection of a grid system and encoding format still needs to be considered and agreed. In addition the file naming convention needs to be specified and described, although there are no laid down requirements and any appropriate format can be used. It was suggested it would be beneficial to follow formats already in use. The version control and format needs to be agreed so updated data files can be readily identified.

The Chair highlighted the need to establish the next stage process to review the draft S-111 PS document. The SCWG spend time reviewing and editing the draft PS; it was agreed there was a requirement to determine, in liaison with TWLWG, the datum relative to which the water level should be referenced for current data points. **Action France.**

UNH identified some items from the WSCG 2001 Conference Proceedings which would provide help guidance on generating the streamlines and how it is described in the portrayal section, reading the first paper will give the foundation for the implementation of the second paper:

Jobard, B., & Lefer, W. (2001). Multiresolution Flow Visualization. In WSCG 2001 Conference Proceedings (Plzen, Czech Republic), (SCWG 2-4.3d)

Liu, Z., Moorhead, R. J., & Groner, J. (2006). An advanced evenly-spaced streamline placement algorithm. *Visualization and Computer Graphics, IEEE Transactions on*, 12(5), 965-972. This can be downloaded from the IEEE site for users who have access:

http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=4015453&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.jsp%3Farnumber%3D4015453.

UNH based the bulk of its implementation on the Jobard and Lefer paper. The Lui paper explains "Our algorithm is an order-of-magnitude faster than Jobard and Lefer's algorithm with better placement quality"

It was agreed the following development programme would be followed:

- a. The vice-Chair to consolidate all comments and circulate S-111 PS v1.2 before end of July. **Action Canada**
- b. Comments and revisions to be received by the vice-Chair by end of August. **Action All**
- c. The vice-Chair to collate and consolidate all comments received on S-111 PS v1.2 and circulate by mid-September. **Action Canada**
- d. Jeppesen to progress S-111 PS Appendix B & C and circulate by mid-September. **Action Jeppesen**
- e. The Chair to progress S-111 PS encoding section and circulate by mid-September. **Action USA**
- f. UNH to progress S-111 PS portrayal section and circulate by mid-September. **Action UNH**
- g. All responses on collated/consolidated S-111 PS version 1.2 comments by end of September. **Action All**
- h. The vice-Chair to circulate S-111 PS v1.3 by end of October. **Action Canada**

It was agreed that reference to S-111 PS v1.3 should be made in the SCWG report to HSSC 6 and a target of end of January for circulating S-111 PS v1.4 should be achievable.

- 4.4 The Chair gave a brief on the Feature Catalogue and Attributes (SCWG 2-4.4). He provided a list of potential Surface Current attributes for consideration and comment. Considerable discussion was generated on the various attributes with some recommended for deletion as being metadata, a number were added or revised. It was noted there was a need to ensure the definitions matched those already published in S-32, IHO Hydrographic Dictionary.

Jeppesen edited and revised the list for further consideration later in the meeting. After further discussion it was agreed Jeppesen would circulate an edited list of potential Surface Current attributes in pdf format for comment and further consideration. **Action Jeppesen**

- 4.5 The vice-Chair gave a presentation on the Surface Currents service provided by the CHS (SCWG 2-4.5). This generated a number of questions and comments.

Discussion then moved to initial testing on a Test Bed, however it was felt the S-111 PS and Feature Catalogue and Attributes needed to be progressed first. SPAWAR Atlantic agreed to run tests and evaluate any supplied current data sets but suggested the S-111 PS needed to be more mature before real value could be gained from any test. The vice-Chair displayed a draft prototype model for consideration and comments.

It was agreed CHS and NOAA would provide test data sets by mid-June for review by SPAWAR Atlantic, with France providing a test data set by mid-July. **Action Canada, USA & France.** The Netherlands would consider the feasibility of providing a test data set later in the year. SPAWAR Atlantic would provide feedback on all test data sets received by mid-August. **Action SPAWAR Atlantic.** In light of feedback received, CHS, NOAA and France would submit amended test data sets to SPAWAR Atlantic. **Action Canada, USA & France.** SPAWAR Atlantic agreed it would be possible to demonstrate a working test S-111 product by mid-February. **Action SPAWAR Atlantic**

- 4.6 The Chair thanked all industry representatives for their interest and valuable contribution to the work of the SCWG. He hoped they would continue the current level of engagement and continue to contribute to the further development of the S-111 PS.

5 **Work Plan 2015-2016**

The Work Plan for period 2015-2016 was displayed and amended in light of the discussions and actions agreed at the meeting, Annex F. The revised Work Plan will be presented to HSSC 6 for approval. It was noted that the Work Plan was the agreed future activity of the SCWG and thus needed commitment from all participants to ensure it was progressed and the target dates were achieved, Annex F.

6 **Review of SCWG ToRs**

The ToRs and RoPs, as approved by HSSC 5, were displayed and reviewed. It was felt there was no requirement to propose any amendments at this stage, Annex E.

7 **Any Other Business**

No items were submitted.

8 **Review of Action Items**

The list of Actions for the meeting were displayed and some revisions were made and agreed, Annex D.

9 **Venue and dates of the 3rd SCWG Meeting**

It was agreed a meeting would be beneficial once the initial complete version of the S-111 Product Specification had been circulated and the test portrayal model had been developed. JHOD kindly offered to host the next meeting, SCWG 3 is tentatively planned for 13-15 May 2015 in Tokyo, Japan.

10 Draft Report to the HSSC / Draft Agenda for SCWG 3

It was agreed that the IHB would circulate a draft meeting report to all attendees by 13 June. **Action IHB.** Attendees were requested to provide any comments by 27 June. **Action ALL.** It was intended the final meeting report would be published by 11 July. **Action IHB**

The IHB, the Chair and the vice-Chair would prepare the final report to HSSC 6 using the format required by HSSC. Representation of SCWG at the HSSC 6 meeting would be discussed between the Chair and the vice-Chair. **Action IHB, USA & Canada**

11 Closing remarks

The Chair thanked everyone for coming to the meeting and for the effort and enthusiasm towards the task; he wished them a safe journey home. He also thanked the DOF Canada for their excellent support and organization, both of which helped greatly in the success of the meeting.

The meeting closed at 1340.

The following Annexes are attached:

- A. List of Participants.
- B. SCWG 2 – Agenda
- C. SCWG 2 – List of Documents
- D. SCWG 2 – List of Actions
- E. SCWG 2 – Draft revised ToRs and RoPs
- F. SCWG 2 – Draft Work Plan 2015-2016
- G. SCWG 2 – Draft Agenda for SCWG 3

**IHO Surface Current Working Group (SCWG)
List of Participants SCWG 2**

Member State	Organization	Name	E-mail
Canada	Canadian Hydrographic Service	Bodo de Lange Boom	Bodo.deLangeBoom@dfo-mpo.gc.ca
Canada	Canadian Hydrographic Service	Louis Maltais (vice-Chair)	Louis.maltais@dfo-mpo.gc.ca
France	Coastal Hydrodynamic Department - SHOM	Ronan Pronost	ronan.pronost@shom.fr
Netherlands	Netherlands Hydrographic Service	Ronald Kuilman	RB.Kuilman@mindef.nl
USA	National Oceanic and Atmospheric Administration	Dave Enabnit	Dave.enabnit@noaa.gov
USA	National Oceanic and Atmospheric Administration	Carl Kammerer	carl.kammerer@noaa.gov
USA	National Oceanic and Atmospheric Administration	Kurt Hess (Chair)	kurt.hess@noaa.gov
USA	National Geospatial-Intelligence Agency	Russ Ives	Russell.C.Ives@nga.mil
IHB	IHB	David Wyatt (Secretary)	adso@iho.int
Expert Contributor	Centre for Coastal and Ocean Mapping, University of New Hampshire, Durham, NH, USA	Briana Sullivan	Briana@ccom.unh.edu
Expert Contributor	SPAWAR Atlantic	Edward Weaver	eweaver@wrsystems.com
Expert Contributor	Jeppesen	Eivind Mong	eivind.mong@jeppesen.com
Expert Contributor	Caris	David Brodie	david.brodie@caris.com

Surface Current Working Group
(2nd Meeting 28 – 30 May 2014 – Quebec City, Canada)
Agenda – (SCWG 2)

1 Opening

- .1 Opening address by the Chairman – Kurt Hess
- .2 Welcome address by *Host* – Louis Maltais
- .3 Welcome by the IHB - David Wyatt

2 Administrative Arrangements

- .1 Adoption of the Agenda
- .2 Conduct of the Sessions
- .3 Report on Intercessional Activities including HSSC 5
- .4 Matters arising from SCWG 1/Review of Work Plan and Action Items

3 Presentations

- .1 The UNH surface currents portrayal survey. (Briana Sullivan)
- .2 NOAA's Physical Oceanographic Real-Time System, PORTS. (Carl Kammerer)
- .3 Highlights of the TWLWG meeting. (David Wyatt)
- .4 Overview of CARIS's efforts on surface currents. (David Brodie)

4 Programme Matters

Note: {xx} indicates SCWG Work Plan reference

- .1 Report on engagement with other IHO bodies (TSMAD and DIPWG). {D} (Kurt Hess)
- .2 Report on analysis of User Survey questionnaire. {A.3} (Ronald Kuilman)
- .3 Creation of Product Specification outline. {B.1} (Louis Maltais)
- .4 Acceptance of the Surface Current Feature and Attributes. {B.1} (Kurt Hess)
- .5 Development of prototype model. {B.2} (Louis Maltais)
- .6 Liaison with industry experts update and future engagement. {C} (Kurt Hess)

5 Work Programme 2015-2016**6 Review of SCWG ToRs****7 Any Other Business**

- .1

8 Review of Action Items**9 Venue and dates of the 3rd SCWG Meeting****10 Draft Report to the HSSC 6 / Draft Agenda for SCWG 3****11 Closing remarks**

SCWG 2 - List of Documents

Document No	Document Title
TWLWG 5 Letter 1	TWLWG 5 Invitation, Registration Form and Logistics Information Letter
TWLWG 5 Registration Form	TWLWG 5 Registration Form (Word Format)
TWLWG 4 Actions	TWLWG 4 List of Action - 17 April 2013
TWLWG 5 Participants	List of Participants - 14 May 2013
TWLWG 5	Agenda
TWLWG 5	Programme
TWLWG 5-2.3-1	Extract from HSSC 4 Report
TWLWG 5-3.1.1	Chile National Presentation
TWLWG 5-4.1	Standard Constituent List Presentation
TWLWG 5.4.3	S-100 Presentation
TWLWG 5-4.4-1	Dynamic Tides in ECDIS
TWLWG 5-4.6-1	Resolution 3-1919 Version 12 October 2012+Australia+Brazil
TWLWG 5-4.6-2	Resolution 3-1919 Finland Comments
TWLWG 5-4.6-3	Resolution 3-1919 BSHC CDWG Comments (track change on 5-4.5-1)
TWLWG 5-4.8-1	Long-term Variations in Amplitudes and Phases of Harmonic
TWLWG 5-4.10-1	EC Submission on Establishment and Maintenance of VRF for High Resolution Bathymetric Surfaces
TWLWG 5-4.10.2	University of Southern Mississippi Paper
TWLWG 5-4.11-1	IHO Resolutions
TWLWG 5-4.12-1	Review of Relevant IHO Charting Specifications
TWLWG 5-4.18-1	Work Programme 2013-2014

LIST OF ACTIONS – Updated 1 September 2014

Agenda Item	Subject	Status/Date	Comments	Action
SCWG 2				
4.2	User Survey Questionnaire	13 Jun	Provide comments to NL on analysis of User Survey Questionnaire responses	All
4.2	User Survey Questionnaire	27 Jun	Publish final analysis report and SCWG comments on User Survey Questionnaire responses	Netherlands/IHB
4.3	Creation of S-111 product specification	27 Jun	Determine in liaison with TWLWG datum relative to which water level should be referenced for current data points	France
4.3	Creation of S-111 product specification	25 Jul	Circulate S-111 PS v1.2	Canada
4.3	Creation of S-111 product specification	29 Aug	Comments on S-111 PS v1.2 to CHS	All
4.3	Creation of S-111 product specification	12 Sep	Collate/consolidate comments on S-111 PS v1.2 and circulate	Canada
4.3	Creation of S-111 product specification	12 Sep	Circulate draft version of Encoding section of S-111 PS	USA
4.3	Creation of S-111 product specification	12 Sep	Circulate draft version of Portrayal section of S-111 PS	UNH
4.3	Creation of S-111 product specification	12 Sep	Circulate draft version of Appendices B & C of S-111 PS	Jeppesen
4.3	Creation of S-111 product specification	10 Oct	Comments on comments on S-111 v1.2 to CHS	All
4.3	Creation of S-111 product specification	10 Oct	Comments on Encoding, Portrayal and Appendices B & C to CHS	All
4.3	Creation of S-111 product specification	31 Oct	Circulate S-111 PS v.1.3	Canada
4.3	Creation of S-111 product specification	14 Dec	Comments on S-111 v1.3 to CHS	All
4.3	Creation of S-111 product specification	30 Jan	Circulate S-111 PS v1.4	Canada
4.3	Creation of S-111 product specification	13 Jun Complete	E-mail WCGS 2001 Conference Proceeding documents to IHB for up-load to website	UNH

4.4	Feature Catalogue and Attributes	2 Jun	Circulate and publish pdf version of revised draft list of Surface Current attributes for comment	Jeppesen/All
4.5	S-111 test data sets	13 Jun	Provide test data set to SPAWAR Atlantic for review	Canada
4.5	S-111 test data sets	13 Jun	Provide test data set to SPAWAR Atlantic for review	USA
4.5	S-111 test data sets	11 Jul	Provide test data set to SPAWAR Atlantic for review	France
4.5	S-111 test data sets	15 Aug	Provide initial feedback on provided test data sets	SPAWAR
4.5	S-111 test data sets	12 Dec	In light of feedback comments, provide amended test data sets to SPAWAR Atlantic	Canada/USA/France
4.5	S-111 test data sets	13 Feb	Demonstrate working test S-111 product	SPAWAR
8	Action List	SCWG 2	Keep IHB informed of progress with allocated actions	All
9	SCWG 3 venue and dates	30 Sep	Circulate an initial letter of invitation	IHB
40	SCWG 2 Draft Report	13 Jun Complete	Draft to be circulated for comment	IHB
40	SCWG 2 Draft Report	27 Jun Complete	All to provide comments on draft report to IHB	All
40	SCWG 2 Final Report	11 Jul Complete	Publish final report	IHB
10	Report to HSSC 6	18 Jul	Draft report for review and amendment by USA and Canada	IHB
10	Report to HSSC 6	15 Sep	Comments back to IHB	Chair, Vice Chair

SURFACE CURRENTS WORKING GROUP

Terms of Reference (ToR)

1. Objective

To develop standards for the delivery and presentation of navigationally significant surface current information.

2. Authority

The Working Group (WG) is a subsidiary of the Hydrographic Services and Standards Committee (HSSC) and its work is subject to HSSC approval.

3. Procedures

- a. The WG should:
 - (1) develop S-100 based product specifications for navigationally significant currents, including definitions and content, and display requirements with technical characteristics;
 - (2) advise IHO on matters concerning the exchange, distribution, display, and use of navigationally significant current data;
 - (3) liaise with relevant IHO WG's to ensure technical feasibility and compatibility of relevant developed proposals.
- b. The WG should work primarily by correspondence, although face to face meetings at the project start is desirable, and thereafter may be convenient when held in conjunction with another convenient IHO forum.
- c. The WG should liaise with other international bodies as appropriate.

Rules of Procedure (RoP)

4. Composition and Chairmanship

- a. The WG shall be comprised of representatives of IHO Member States (MS), Expert Contributors and accredited Non-Governmental International Organization (NGIO) Observers, all of whom have expressed their willingness to participate, and a representative of the IHB.
- b. Member States, Expert Contributors and accredited NGIO Observers may indicate their willingness to participate at any time. A membership list shall be maintained and confirmed annually.
- c. Expert Contributor membership is open to entities and organizations that can provide a relevant and constructive contribution to the work of the WG.
- d. The Chair and Vice Chair shall be a representative of a Member State. The election of the Chair and Vice-Chair should normally be decided at the first meeting following each ordinary session of the Conference (Conference to be replaced by Assembly when the

revised IHO Convention enters force) and, in such case, shall be determined by vote of the Member States present and voting.

- e. Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the WG, only MS may cast a vote. Votes shall be on the basis of one vote per MS represented. In the event that votes are required between meetings or in the absence of meetings, including for elections of the Chair and Vice-Chair, this shall be achieved through a postal ballot of those MS on the current membership list.
- f. If a secretary is required it should normally be drawn from a member of the WG.
- g. If the Chair is unable to carry out the duties of the office, the Vice-Chair shall act as the Chair with the same powers and duties.
- h. Expert Contributors shall seek approval of membership from the Chair.
- i. Expert Contributor membership may be withdrawn in the event that a majority of the MS represented in the WG agree that an Expert Contributor's continued participation is irrelevant or unconstructive to the work of the WG.
- j. All members shall inform the Chair in advance of their intention to attend meetings of the WG.
- k. In the event that a large number of Expert Contributor members seek to attend a meeting, the Chair may restrict attendance by inviting Expert Contributors to act through one or more collective representatives.

10 SCWG Work Plan 2015-2016

10.1 SCWG Tasks

A	Maintain and extend the relevant IHO standards, specifications and publications (IHO Task 2.13.2 refers)
B	Develop, maintain and extend a Product Specification for the transmission of real-time surface current data (IHO Task 2.13.3 refers)
C	Develop, maintain and extend a Product Specification for dynamic surface currents in ECDIS (IHO Task 2.13.4 refers)
D	Conduct the 2014 and 2015 meetings of SCWG (IHO Task 2.13.1 refers)

Task	Work item	Priority H-high M-medium L-low	Milestones	Start Date	End Date	Status P-planned O-ongoing C-completed	Contact Person(s) * indicates leader	Related Pubs/Standard
A.1	Relevant IHO Resolutions in M-3	H	Keep the Resolutions fit for purpose	Continuous		O		
A.2	S-60 User's Handbook on Datum Transformations involving WGS 84	M		Continuous		O		
B.1	Develop, maintain and extend a Product Specification for the transmission of real-time surface current data	H	Include section on real-time data in the PS Liaise with TWLWG on standards and methods	2014 2014	2017 2017	O O	Maltais*, Kammerer Hess*, Jan, Pronost	
B.2	Establish formats for the transmission and display of real-time current data	H	Prepare test data sets for transmission Test the portrayal of real-time current data	2014 2014	2017 2017	O O	Kammerer*, Maltais Weaver*, Sullivan, Kammerer	

Task	Work item	Priority H-high M-medium L-low	Milestones	Start Date	End Date	Status P-planned O-ongoing C-completed	Contact Person(s) * indicates leader	Related Pubs/Standard

10.2 SCWG Meetings (IHO Task C)

Date	Location	Activity
29 – 31 May 2013	Silver Spring, USA	1 st Meeting
3 – 5 June 2014	Quebec City, Canada	2 nd Meeting
13 – 15 May 2015	Tokyo, Japan	3 rd Meeting

Chair: Kurt Hess

Vice-Chair: Louis Maltais

Secretary: David Wyatt

Email: kurt.hess@noaa.gov

Email: Louis.maltais@dfo-mpo.gc.ca

Email: adso@iho.int

Surface Current Working Group
(3rd Meeting 13 – 15 May 2015 – Tokyo, Japan)
Agenda – (SCWG 3)

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- .2 Welcome address by Host – Tatsuo Komori
- .3 Welcome by the IHB – David Wyatt

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- .1 The UNH surface currents portrayal survey. (Briana Sullivan)
- .2 NOAA's Physical Oceanographic Real-Time System, PORTS. (Carl Kammerer)
- .3 Highlights of the TWLWG meeting. (David Wyatt)
- .4 Overview of CARIS's efforts on surface currents. (David Brodie)

4 Programme Matters

Note: {xx} indicates SCWG Work Plan reference

- .1 Report on engagement with other IHO bodies (TSMAD and DIPWG). {D} (Kurt Hess)
- .2 Report on analysis of User Survey questionnaire. {A.3} (Ronald Kuilman)
- .3 Creation of Product Specification outline. {B.1} (Louis Maltais)
- .4 Acceptance of the Surface Current Feature and Attributes. {B.1} (Kurt Hess)
- .5 Development of prototype model. {B.2} (Louis Maltais)
- .6 Liaison with industry experts update and future engagement. {C} (Kurt Hess)

5 Work Programme 2016-2017**6 Review of SCWG ToRs****7 Any Other Business**

- .1

8 Review of Action Items**9 Venue and dates of the 4th SCWG Meeting****10 Draft Report to the HSSC 7 / Draft Agenda for SCWG 4****11 Closing remarks**