

8<sup>TH</sup> MEETING OF THE HYDROGRAPHIC SERVICES AND STANDARDS COMMITTEE  
 MONACO, 14 -18 November 2016

HSSC H2S PT HYDROGRAPHIC SURVEYS SCOPINGPROJECT TEAM (H2S PT)  
 (HSSC7 action 7/02and 7/03).

**Paper for Consideration by HSSC**  
 Report of the Correspondence Group on HSSC–H2SPT

**Submitted by:** Chair, H2SPT

**Executive Summary:** This paper reports on the outcome of the Correspondence Group on HSSC H2S PT HYDROGRAPHIC SURVEYS SCOPINGPROJECT TEAM (H2S PT) (HSSC7 action 7/02and 7/03).

**Related Documents:** - Final minutes of HSSC-7(paragraph 3.c);  
 - Terms of Reference and Rules of Procedure of H2SPT;  
 - IHO CL 25/2015 dated 17 March - Reorganized structure of the Hydrographic Services and Standards Committee (HSSC) -Consideration of the need to establish a Hydrographic Surveys Working Group  
 - HSSC-7 DOC HSSC7-03C  
 - IHO CL 83/2015  
 -

**Related Projects:** Hydrographic Survey Work Group.

**Chair:** Cap. Nickolás de Andrade Roscher, Brazil

**Vice-Chair:** Vacant

**Secretary:** Mrs Megan Palmer Greenaway, USA

**Member States:** Argentina, Australia, Belgium, Brazil, Chile, France, Germany, Italy, Japan, New Zealand (2), Nigeria, Portugal, Russian Federation, Sweden, Sweden, Turkey, Ukraine, Ukraine, USA (2).

**Expert Contributor Organisations:** CARIS, FIG, IFHS, Fugro LADS Corporation Pty Ltd, Fugro Pelagos Inc., Nigerian Ports Authority

*see Annex A for full details*

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## Background

1. As requested by the IHO Hydrographic Services and Standards Committee (HSSC), Reference A sought the views of Member States on the adequacy of IHO Publication S-44 - IHO Standards for Hydrographic Surveys, on related work items which might be relevant, if any, and on the possible establishment of a dedicated hydrographic surveys working group.
2. The Project Team the 9 Member States that responded to H2SPT Questionnaire: Brazil, Chile, Germany, Italy, Japan, New Zealand, Portugal, Sweden, and United States.
3. A summary of the responses was prepared for further consideration by HSSC at its 8th meeting in Monaco, from 14 to 18 November.
4. The HSSC Committee noted the report and decided to create a Hydrographic Surveys Scoping Project Team (HS2PT) that would be tasked, for one year, to clarify the scope and the deliverables expected from any new hydrographic surveys working group, if and when established. The Committee approved the Terms of Reference provided in Annex B, requesting the Project Team to present its recommendations to the 8th meeting of the HSSC in November 2016. The representative of Brazil at HSSC-7, Mr. Nickolas de Andrade ROSCHER, chaired the Project Team. According to its Terms of Reference, the Project Team conducted its work by correspondence.
5. Outcome out of HSSC-7 meeting, November 2015: - The Committee established a Project Team on Hydrographic Surveys Scoping under the terms of reference which would scope out the requirements and report back to the HSSC-8 meeting.

Actions : HSSC7/02 and HSSC7/03.

Terms of Reference

1. The terms of reference of the H2SPT was defined by HSSC7 action 7/02: "H2SPT was tasked to establish a correspondence group, to define the SCOPE of the draft terms of reference and rules of procedure for the proposed new HSSC body, if the group is convinced that the WG is needed."

Membership and Work Method

1. HSSC had agreed that the PT would be open to representative of Member States (MS) and industry, in accordance with action HSSC7/02, IHO Circular Letter (CL) 83/2015 dated 07 December 2015. 28 representatives were indicated with name and contact information. 18 MS (Argentina, Australia, Belgium, Brazil, Chile, France, Germany, Italy, Japan, New Zealand (2), Nigeria, Portugal, Russian Federation, Sweden, Sweden, Turkey, Ukraine, Ukraine, USA (2)), and 6 Member from industry and international institutions (CARIS, FIG, IFHS, Fugro LADS Corporation Pty Ltd, Fugro Pelagos Inc., Nigerian Ports Authority).
2. The membership of the PT is indicated in Annex A.
3. The Project Team was activated on the 28<sup>th</sup> June, by email were the Chair sent an overall view of the work ahead. The Member prepared a draft Term of reference and rules of procedure (TOR (Annex B)) for the new proposed WG as well as this report.
4. The work was conducted by exchange of e-mails.

Outcomes, Analysis and Discussion

1 Tasked objective from the TOR:

- a) Consider Doc. HSSC7-03C "Consideration of the need to establish a HSWG";
- b) Justify the need for "hydrographic survey" related to standardization activities;

- c) Define the scope (subject areas, technology, standards, data usage, training, etc.) and possible tasks that may be considered by the IHO, and consult the IHO Member States as appropriate;
- d) Propose recommendations on the way forward (what, who, when, how) at HSSC-8.

## 2 Analyses and Discussion

After a brief email changes, the Chair sent a Questionnaire to the Project Team, the answers were supposed to fulfill the tasked objectives. All the MS consider the need to establish a HSWG.

Chile replied the Questionnaire with the CL-25-2015 response, it was understood that they remain with the same point that even though they understand that the S-44 doesn't need any update there are many tasks that could be addressed to the HSWG.

Sweden answers the Questionnaire in the body of the response e-mail, and pointed that there are many tasks that could be addressed to the HSWG.

- a) Considerations about "Consideration of the need to establish a HSWG"

All the answerers considered the need of establishing the HSWG.

- b) Consideration about how to Justify the need for "hydrographic survey" Working Group related to standardization activities;

Yes	We need define the need of establishing the HSWG, even though the last up date was discussed 10 years ago, and if we start next year it won't be finished before 2020, at least 3 years depending on the scope approved	Brazil
	Because there is a need to: <ul style="list-style-type: none"> <li>- Establish standards for exchange of Hydrographic Survey data for use in joint production of Charts, such as INT Charts.</li> <li>- Establish standards for vertical Datum,</li> <li>- Establish standards for conducting Surveys after Natural disaster. As many others.</li> </ul>	Chile
Yes	IIM (Istituto Idrografico della Marina) by the law is responsible to define technical guideline for Hydrographic survey in national water. The national technical specification (edition 2016) is derived by the S-44 5 Edition where there is a lack of standards for engineering and dredging. Furthermore the new and emerging technologies, such as LiDAR and satellite derived bathymetry, needs to be integrated into the S44	Italy
Yes	S-44 is for sure an essential IHO publication and there is a need to update S-44 or its related documents. The publication could include more general standards for hydrographic surveying and include new methods and up-to-date techniques. But before establishing a WG to provide a new edition we should weight the potential benefit and the effort and there should be a common understanding on the way forward and a clear commitment of MS to contribute to that	Germany

	work...	
	<u>We would like to take part in the HSWG in case that the WG is established.</u>	Japan
Yes	As HOs move towards Marine Spatial Data Infrastructure, S-44 would benefit from an update to incorporate new technologies and to encompass the improvements in existing technologies.	New Zealand
Yes	<p>The Portuguese Hydrographic Office suggest the following items to be considered on a future S-44 revision by the HSWG:</p> <p>a) improve the minimum standards of the surveys, taking into account the current capabilities of the equipment (e.g. RTK tide; DGNSS RTK; MBES evolution: clean detection algorithm and additional bathymetry from water column analyses);</p> <p>b) define the minimum standards for Bathymetric Models using depth/resolution/density, create sounding designation criteria for safety of navigation purposes and define node uncertainty conditions/limits;</p> <p>Although, the HSWG should not be restricted to the S-44 revision; this WG should also review other IHO publications, for instance the inclusion of guidelines for all new hydrographic technologies in C-13. The establishment of new hydrographic survey standards for other purposes than the safety of navigation should also be addressed in this WG.</p>	Portugal
	There is much wider than just focusing on the S-44, and collecting more information now about the need for changes in a new revision of the S-44 should rather be done after such a task has been given to either H2SPT or a specific WG for the revision of S-44. Seeing all suggestions that have been put forward regarding a new revision of the S-44 it is a must to remember that “Hydrographic Surveying” according to UNCLOS is purely surveying for the safety of navigation, all other forms of bathymetric data collection falls under the term of “Scientific Research”. This doesn’t hinder that other orders than what today is considered to be necessary for safe navigation is developed, that in turn can be adopted for research, pre- and post-construction surveys and other uses.	Sweden
Yes	<p>There is a need to update sections of S-44 to meet current hydrographic technology. The last time the S-44 was updated (5<sup>th</sup> ed) was 2005 and adopted in 2008. At that point, the S-44 Working Group was then disbanded.</p> <p>Other documents which should be updated along with S-44 are C-13 “Manual on Hydrography” and S-32 “Hydrographic Dictionary”. Other documents should not include S-5 “Standards of Competence for Hydrographic Surveyors” (see Part 2 Question 3 below).</p>	USA

1 – Do you think there is a need or interest to establish HSWG to make a revision of the IHO publication related to hydrographic surveying, S-44?

YES \_\_\_\_\_

NO \_\_\_\_\_

Please justify:

Yes	We need define the need of stablishing the HSWG, even though the last up date was discussed 10 years ago, and if we start next year it won't be finished before 2020, at least 3 years depending on the scope approved	Brazil
	Because there is a need to: - Establish standards for exchange of Hydrographic Survey data for use in joint production of Charts, such as INT Charts. - Establish standards for vertical Datum, - Establish standards for conducting Surveys after Natural disaster. As many others.	Chile
Yes	IIM (Istituto Idrografico della Marina) by the law is responsible to define technical guideline for Hydrographic survey in national water. The national technical specification (edition 2016) is derived by the S-44 5 Edition where there is a lack of standards for engineering and dredging. Furthermore the new and emerging technologies, such as LIDAR and satellite derived bathymetry, needs to be integrated into the S44	Italy
Yes	S-44 is for sure an essential IHO publication and there is a need to update S-44 or its related documents. The publication could include more general standards for hydrographic surveying and include new methods and up-to-date techniques. But before stablishing a WG to provide a new edition we should weight the potential benefit and the effort and there should be a common understanding on the way forward and a clear commitment of MS to contribute to that work...	Germany
	We would like to take part in the HSWG in case that the WG is established.	Japan
Yes	As HOs move towards Marine Spatial Data Infrastructure, S-44 would benefit from an update to incorporate new technologies and to encompass the improvements in existing technologies.	New Zealand
Yes	The Portuguese Hydrographic Office suggest the following items to be considered on a future S-44 revision by the HSWG: c) improve the minimum standards of the surveys, taking into account the current capabilities of the equipment (e.g. RTK tide; DGNSS RTK; MBES evolution: clean detection algorithm and additional bathymetry from water column analyses);	Portugal

	<p>d) define the minimum standards for Bathymetric Models using depth/resolution/density, create sounding designation criteria for safety of navigation purposes and define node uncertainty conditions/limits;</p> <p>Although, the HSWG should not be restricted to the S-44 revision; this WG should also review other IHO publications, for instance the inclusion of guidelines for all new hydrographic technologies in C-13. The establishment of new hydrographic survey standards for other purposes than the safety of navigation should also be addressed in this WG.</p>	
	<p>There is much wider than just focusing on the S-44, and collecting more information now about the need for changes in a new revision of the S-44 should rather be done after such a task has been given to either H2SPT or a specific WG for the revision of S-44. Seeing all suggestions that have been put forward regarding a new revision of the S-44 it is a must to remember that “Hydrographic Surveying” according to UNCLOS is purely surveying for the safety of navigation, all other forms of bathymetric data collection falls under the term of “Scientific Research”. This doesn’t hinder that other orders than what today is considered to be necessary for safe navigation is developed, that in turn can be adopted for research, pre- and post-construction surveys and other uses.</p>	Sweden
Yes	<p>There is a need to update sections of S-44 to meet current hydrographic technology. The last time the S-44 was updated (5<sup>th</sup> ed) was 2005 and adopted in 2008. At that point, the S-44 Working Group was then disbanded.</p> <p>Other documents which should be updated along with S-44 are C-13 “Manual on Hydrography” and S-32 “Hydrographic Dictionary”. Other documents should not include S-5 “Standards of Competence for Hydrographic Surveyors” (see Part 2 Question 3 below).</p>	USA

c) Consideration about the defining of the scope (subject areas, technology, standards, data usage, training, etc.) and possible tasks that may be considered by the IHO, and consult the IHO Member States as appropriate;

Questionnaire part 2:

Part 2: What and why does any task be addressed to the Hydrographic Survey Standard?

The name of the working group will be Hydrographic Survey Working Group, what about bringing up more than one, may be one for dredging, another one for Environmental Surveys, Offshore Surveys, Gas and Oil Surveys, any other. That mean the HSWG will have to lease with all other IHO working Groups to get information to undergo all TOR tasks.

Questions:

1 - On the last 68 years the SP-44, or S-44, has had the roll to specify standards for SAFETY OF NAVIGATION purposes; do we think it is time to spread the focus of this Publication?

YES

NO

Comments (if any):

NO	The aim of the HSWG should be Safety of Navigation.	Brazil
YES	-	Chile
NO	The aim of the S44 should be the definition of minimum standards for the safety of navigation in the area where these are considered important. Outside that scope (Offshore Surveys, Gas and Oil Surveys etc) the standard requested must be outlined by the operators for the specific purposes.	Italy
	Within the IHO surveying and its standard has been focusing on safety of navigation. It is not realistic to cover all aspects of hydrographic surveys (i.e. special tasks like dredging, offshore constructions ...) in one standard. But it is obvious that surveys of HOs can be and are often used from a wide range of users (i.e. coastal protection, science ...). These uses are important for the recognition of Hydrographic Offices beyond safety of navigation. These survey tasks are services to the public. Therefore I see the product of HO surveys as basic geodata, processed to a certain extend that allows the broad use of this product, especially to derive final products like nautical charts. This basic product will not suit all uses due to their sometimes contrarious quality specifications, but it is a compromise as a generic product with a focus on safety of navigation.	Germany
NO		Japan
	S-44 Standards can still be applied to surveys which purpose is not safety of navigation. It should be up to the	New Zealand



	National Authority to tighten or relax these standards as appropriate.	
NO	The S-44 should only address standards for SAFETY OF NAVIGATION purposes. These standards should be kept independent from the survey technology. The standards for other purposes should be the focus of a new publication.	Portugal
YES	Revision and maintenance of the C-13 that the previous S-44 WG clearly pointed out that the annexes A and B were to be lifted away from the S-44 and included into C-13 or other relevant guides <input type="checkbox"/> Keeping track on the various national implementations of the S-44 which might lead to that different HO's can adopt others or create common implementations. <input type="checkbox"/> Be an already formed group for support of other HSSC-WG. <input type="checkbox"/> Together with the other HSSC-WG keep the Hydrographic Dictionary S-32 up to date. <input type="checkbox"/> Support the Boards on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) in the creation of educational programs. <input type="checkbox"/> Revision of the S-44, if and when HSSC so decides.	Sweden
NO	We do not have the expertise to define the standards for these other industries. In addition, the other industries already have their own standards and working groups.	USA

2 – Do you think we should include Standards for any of the above Themes?

- Offshore Surveys,  
 Gas and Oil Surveys,  
 Environmental Surveys,  
 Any other Theme:  
 1 Dredging and SBD  
 1 Provision of basic data (general, topographic)

Comments (if any):

		Brazil
	-	Chile
	As mentioned at point 1.1 for the post-dredging surveys a set of more specific standards is demanded. In fact, because of the draft of the ships, the volume of commercial traffic on the sea and the minimum under-keel clearance is necessary to apply more stringent standards for surveys in harbor areas. Port authorities should ensure the navigability through functional verification and ordinary and extraordinary maintenance of the common areas, including maintenance of the seabed of the ports within their competence, which also takes place through the execution of hydrographic surveys.	Italy

	Within the IHO surveying and its standard has been focusing on safety of navigation. It is not realistic to cover all aspects of hydrographic surveys (i.e. special tasks like dredging, offshore constructions ...) in one standard. But it is obvious that surveys of HOs can be and are often used from a wide range of users (i.e. coastal protection, science ...). These uses are important for the recognition of Hydrographic Offices beyond safety of navigation. These survey tasks are services to the public. Therefore I see the product of HO surveys as basic geodata, processed to a certain extend that allows the broad use of this product, especially to derive final products like nautical charts. This basic product will not suit all uses due to their sometimes contrarious quality specifications, but it is a compromise as a generic product with a focus on safety of navigation.	Germany
		Japan
	We believe the revision of S-44 should be technology agnostic.	New Zealand
	Yes, but in a new publication, for instance a “Hydrographic Survey Standards for Others Purposes than Safety of Navigation”. We think there should be a Sub-WG for each of the proposed themes.	Portugal
		Sweden
NO	We do not have the expertise to define the standards for these other industries. In addition, the other industries already have their own standards and working groups.	USA

3 – Do you think that the courses though under S-5A and S-5B Standard, enhance the quality of the Surveys, and that we should address the IBSC standards on S-44?

YES \_\_\_\_\_

NO \_\_\_\_\_

Comments (if any):

YES	The WG will need to liaise with IRCC/IBSC	Brazil
		Chile
YES		Italy
NO	Regarding S-5 and S-8 there might be a need lo liaise with IBSC at a later stage.	Germany
		Japan
		New Zealand
NO	We think that S-5A and S-5B Standards enhance the quality of the Surveys. Nevertheless the technical skills required for hydrographic surveys are well defined in the S-5A and S5-B, therefore this matter doesn’t need to be addressed in the S-44. S-44 should only address data requirements for the hydrographic surveys.	Portugal

	Support the Boards on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) in the creation of educational programs.	Sweden
NO	We think the courses in S-5A/B enhance the quality of the surveys but S-5A/B already has a Working Group and therefore we should not duplicate effort. We could support the S-5A/B Working Group as subject matter experts or consultants but we should not include S-5A/B as one of our objectives in the HSWG.	USA

4 - Do you think that use of S-100 standard and derived formats will enhance the quality of the Surveys, and that they should be addressed on S-44?

YES \_\_\_\_

NO \_\_\_\_

Comments (if any):

YES	Correlate both S-57's CATZOC and S-44's orders of Survey	Brazil
	-	Chile
NO		Italy
NO	In my view it is the other way round. New demands on the quality of our products might lead to changing standards in surveying.	Germany
		Japan
NO	We do not believe the standards should be tied to S-100 standard and derived formats.	New Zealand
YES	We think the HSWG should promote the harmonization between S-44 and S-100. For instance there is no actual connection between S-57's CATZOC and S-44's orders of survey.	Portugal
	Be an already formed group for support of other HSSC-WG.	Sweden
NO	There is already a Working Group for S-100 and we should not duplicate effort. The S-44 and S-100 standards promote one another but they should remain separate. For example, updates to the hydrographic survey standards will sometimes drive updates to the product standards. And updates to products standards will sometimes drive updates to the hydrographic standards.	USA

Taking in to account the technological development the WG should consider including new techniques of seafloor mapping like?

Y/N - \_\_\_\_ - Interferometric SSS,

Y/N - \_\_\_\_ - Hygh frequencies MB,

Y/N - \_\_\_\_ - LIDAR,

Y/N - \_\_\_\_ - Crowd Sourcing,

Y/N - \_\_\_\_ - Satelite bathimetry,

Y/N - \_\_\_\_ - Seafloor Backscatter,

Y/N - \_\_\_\_\_ - \_\_\_\_\_

	BRA	CHI	ITA	GER	JAP	NZE	POR	SWE	USA
Interferometric SSS	Y			Y			Y		N
Hygh frequencies MB	Y			Y			Y		N
LIDAR,	Y		Y	Y	Y	Y	Y		N
Crowd Sourcing	Y			Y		Y	Y		N
Satelite bathimetry	Y		Y	Y		Y	Y		N
Seafloor Backscatter	Y		Y	Y		Y	Y		N
Water Column/Multi-Detect						Y	Y		N

(NEW Zealand) Perhaps the GEOHAB BSWG would be best placed to advice on taking the BSWG Recommendations document and creating a BS standard from this.

(Portugal) The Portuguese Hydrographic Office encourages the development of new techniques of seafloor mapping listed above. The HSWG should promote the inclusion of guidelines for all new hydrography's technologies in C-13, with exception of Crowd Sourcing, which we don't consider a new hydrographic survey technique. Although the policy for the use of Crowd Sourcing data should be evaluated (a matter which is already addressed by the Crowd Sourced Bathymetry WG -CSBWG).

(USA) We have hydrographic standards and regardless of the platform, equipment or technology, the standards must be achieved. There should not be separate standards within the hydrographic standards for different types of technology.

d) Consideration about proposing recommendations on the way forward (what, who, when, how) at HSSC-8.

#### Impact of other developments

The implementation of the decision of HSSC-7- action 02, to decide whether or not to create a Working group to prepare a new edition of IHO Publication S-44 has led to the establishment of a project team subordinate to the HSSC. There was, however, a discussion on how spread the Hydrographic Survey Work Group should go, would the WG have tasks to be a permanent WG? Or rather be an ad-hock WG? The outcomes are compatible with the work ahead.

#### -Conclusions and Recommended Actions

##### Recommendations and the way forward:

- 1- The Project Team recommends establishing the HSWG.
- 2- As a first approach the main Task should be to update the S-44 Publication and further on to liaise with other IHO bodies to verify the possibility to update/create other IHO Publications.
- 3- The Project Team understands that the MS that have already enrolled to the Project Team will be able to run the Tasks needed at least to update the S-44 Publication. Further actions, should be verified if they are pertinent, in order to maintain the WG as permanent, the WG Tasks would be to update/create other Standards as demanded by HSSC.
- 4- It should be run as correspondence WG. Noting that many HOs are exposed to budgetary constraints which reduces significantly, their ability to contribute actively to HSWG, the meetings if any should be face to face with other HSSC WG where the participation of as many members as possible will be present.

#### Terms of Reference and Rules of Procedure

The draft terms of reference and rules of procedure of the new WGs are attached in AnnexB.

#### Work Plan

The draft work plans of the new WGs are attached in Annex C.

#### Action Required of HSSC

The H2SPT is invited to:

- a. note the report,
- b. consider and adopt the proposals,
- c. Take any other action as appropriate.